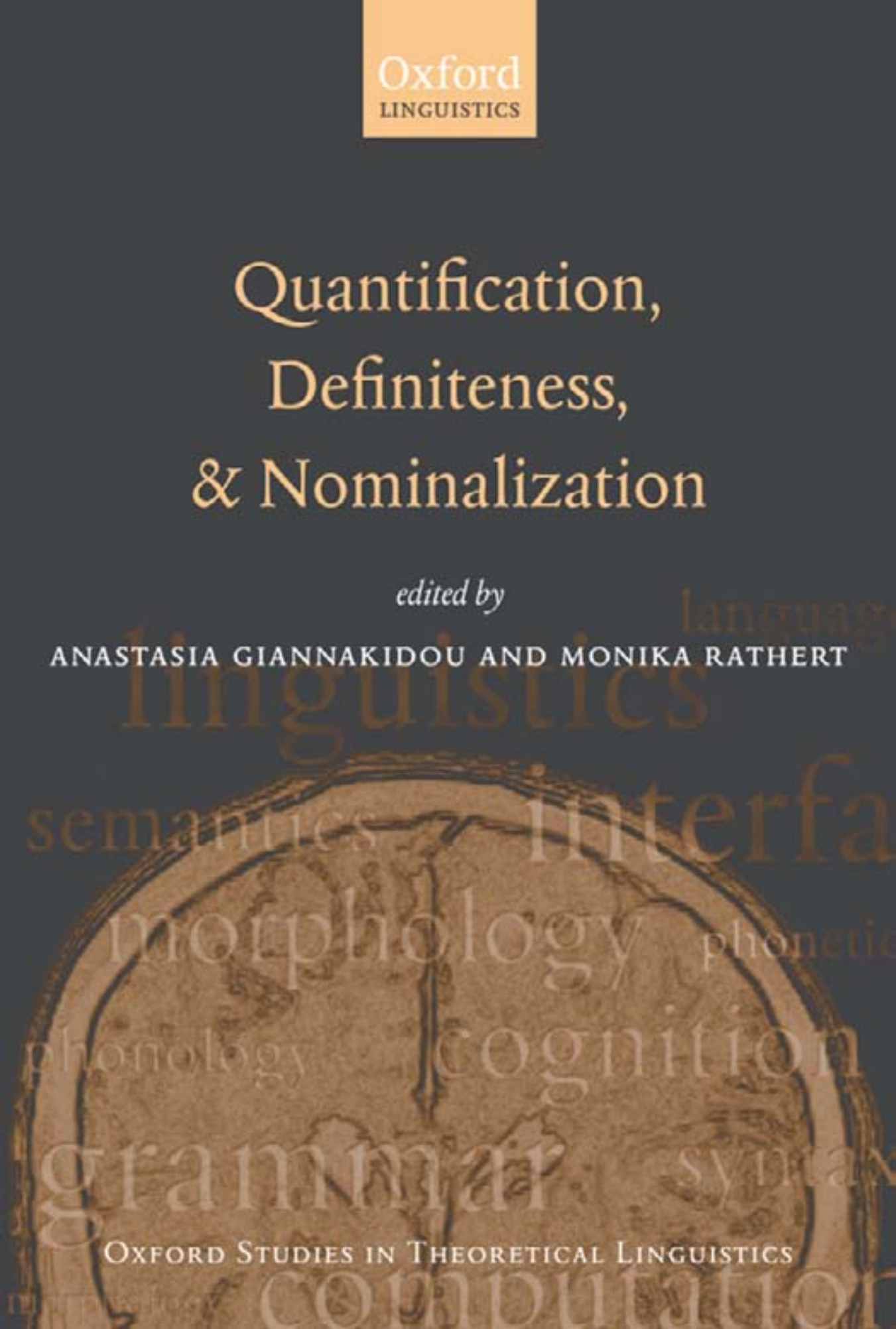
Oxford
LINGUISTICS

Quantification, Definiteness, & Nominalization

edited by

ANASTASIA GIANNAKIDOU AND MONIKA RATHERT



OXFORD STUDIES IN THEORETICAL LINGUISTICS

Quantification, Definiteness, and Nominalization

OXFORD STUDIES IN THEORETICAL LINGUISTICS

RECENT TITLES

10 *The Syntax of Aspect: Deriving Thematic and Aspectual Interpretation*
edited by Nomi Erteschik-Shir and Tova Rapoport

11 *Aspects of the Theory of Clitics*
by Stephen Anderson

12 *Canonical Forms in Prosodic Morphology*
by Laura J. Downing

13 *Aspect and Reference Time*
by Olga Borik

14 *Direct Compositionality*
edited by Chris Barker and Pauline Jacobson

15 *A Natural History of Infixation*
by Alan C. L. Yu

16 *Phi Theory: Phi-Features Across Modules and Interfaces*
edited by Daniel Harbour, David Adger, and Susana Béjar

17 *French Dislocation: Interpretation, Syntax, Acquisition*
by Cécile De Cat

18 *Inflectional Identity*
edited by Asaf Bachrach and Andrew Nevins

19 *Lexical Plurals*
by Paolo Acquaviva

20 *Adjectives and Adverbs: Syntax, Semantics, and Discourse*
edited by Louise McNally and Christopher Kennedy

21 *InterPhases: Phase-Theoretic Investigations of Linguistic Interfaces*
edited by Kleanthes Grohmann

22 *Negation in Gapping*
by Sophie Repp

23 *A Derivational Syntax for Information Structure*
by Luis López

24 *Quantification, Definiteness, and Nominalization*
edited by Anastasia Giannakidou and Monika Rathert

PUBLISHED IN ASSOCIATION WITH THE SERIES

The Oxford Handbook of Linguistic Interfaces
edited by Gillian Ramchand and Charles Reiss

For a complete list of titles published and in preparation for the series, see list at end of book.

Quantification, Definiteness, and Nominalization

Edited by
ANASTASIA GIANNAKIDOU
and
MONIKA RATHERT

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS
Great Clarendon Street, Oxford ox2 6dp
Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide in
Oxford New York
Auckland Cape Town Dar es Salaam Hong Kong Karachi
Kuala Lumpur Madrid Melbourne Mexico City Nairobi
New Delhi Shanghai Taipei Toronto
With offices in
Argentina Austria Brazil Chile Czech Republic France Greece
Guatemala Hungary Italy Japan Poland Portugal Singapore
South Korea Switzerland Thailand Turkey Ukraine Vietnam
Oxford is a registered trade mark of Oxford University Press
in the UK and in certain other countries
Published in the United States
by Oxford University Press Inc., New York

First published by Oxford University Press 2008

British Library Cataloguing in Publication Data
Data available
Library of Congress Cataloging in Publication Data
Data available
Typeset by SPI Publisher Services, Pondicherry, India
Printed in Great Britain
on acid-free paper by
CPI Antony Rowe, Chippenham, Wiltshire

ISBN 978–0–19–954109–6 (Pbk.)
978–0–19–954108–9 (Hbk.)
1 3 5 7 9 10 8 6 4 2

Contents

General Preface

The theoretical focus of this series is on the interfaces between subcomponents of the human grammatical system and the closely related area of the interfaces between the different subdisciplines of linguistics. The notion of 'interface' has become central in grammatical theory (for instance, in Chomsky's recent Minimalist Program) and in linguistic practice: work on the interfaces between syntax and semantics, syntax and morphology, phonology and phonetics, etc. has led to a deeper understanding of particular linguistic phenomena and of the architecture of the linguistic component of the mind/brain.

The series covers interfaces between core components of grammar, including syntax/morphology, syntax/semantics, syntax/phonology, syntax/pragmatics, morphology/phonology, phonology/phonetics, phonetics/speech processing, semantics/pragmatics, intonation/discourse structure as well as issues in the way that the systems of grammar involving these interface areas are acquired and deployed in use (including language acquisition, language dysfunction, and language processing). It demonstrates, we hope, that proper understandings of particular linguistic phenomena, languages, language groups, or inter-language variations all require reference to interfaces.

The series is open to work by linguists of all theoretical persuasions and schools of thought. A main requirement is that authors should write so as to be understood by colleagues in related subfields of linguistics and by scholars in cognate disciplines.

David Adger
Hagit Borer

Preface

The chapters in this volume are updated versions of talks that were presented at the workshop *QP structure, Nominalizations, and the role of DP* that we organized at Saarland University, Germany, in December 2005. Although the connection between QP structure and definiteness, on the one hand, and nominalizations and definiteness, on the other, were long observed in the literature, there has never been an attempt to bring the three together, and our aim at the workshop was to do exactly this: to address recent developments in the area of quantifier phrase structure, nominalizations, and the role of the definite determiner D. We invited discussions among the central approaches in syntax, morphology, semantics, and typology, paving the way towards a more comprehensive understanding of how quantification, definiteness, and nominalizations are encoded in the grammar.

The result was a lively and engaging workshop, with papers addressing the core issues that we wanted to tackle, including the role of number, partitivity, determinerless QPs, animacy, typological variation in nominalization, and the relation between syntax and semantics. The theoretical discussions were framed in a cross-paradigm and cross-linguistic perspective, and a significant number of (partially understudied) languages were explored, including Native American languages (e.g. Salish), Basque, Hebrew, Chinese, Japanese, Korean, alongside English, Greek, and other more familiar European languages.

The contributions in this volume are at the interfaces between syntax–morphology, syntax–semantics, and morphology–semantics, and many of the novel and challenging ideas presented here come precisely *because* of exploring questions posed at the interfaces. In addition, different theoretical paradigms are represented – from Optimality Theory to Distributed Morphology, and model theoretic semantics. Given the breadth of empirical coverage and expertise, we expect this volume to be useful to linguists working in the areas of quantification, nominalization, and (in)definiteness, and, given the broad domain of discussion, we hope it will be equally valuable to syntacticians, semanticists, morphologists, as well as general linguists interested in the large number of cross-linguistic data discussed. The volume can also be used for graduate and undergraduate level teaching, though those who will maximally benefit from its discussions will be researchers at the graduate level with some familiarity with the issues.

It was an enormous pleasure for both of us to prepare this volume. We wish to thank the institutions that provided financial and structural support for our workshop: the *Deutsche Forschungsgemeinschaft* (DFG, GZ 4851/179/05) for the grant, the *Department of Computational Linguistics and Phonetics*, Saarland University, in particular Manfred Pinkal and his group, for their kind hospitality at the newly built *Centre for Language Research and Technology* where the workshop took place.

We would also like to thank our authors for their contributions, as well as for responding promptly to all our requests. We have learned a lot from reading their chapters and from working with them through the various drafts. Many thanks also to the anonymous reviewers from Oxford University Press for their insightful feedback and encouragement, as well as to Hagit Borer and David Adger for including this volume in the series *Oxford Studies in Theoretical Linguistics*.

Finally, we would like to thank the editorial team at Oxford University Press for their valuable editorial assistance and guidance. John Davey's positive energy and good humour, especially, have been instrumental in keeping us on track, and made the editing of this book a much more exciting project than it could have otherwise been.

Anastasia Giannakidou and Monika Rathert
Chicago/Frankfurt a.M., November 2008

Notes on the Contributors

Artemis Alexiadou is Professor of English Linguistics at the Universität Stuttgart and her research interests lie in theoretical and comparative syntax, with special focus on the interfaces between syntax and morphology and syntax and the lexicon. Her books include *Adverb Placement* (Benjamins, 1997), *Functional Structure in Nominals* (Benjamins, 2001), *Noun Phrase in the Generative Perspective*, co-authored with Liliane Haegeman and Melita Stavrou (Mouton de Gruyter, 2007), and *The Unaccusativity Puzzle,* co-edited with Elena Anagnostopoulou and Martin Everaert (Oxford University Press, 2004). She is currently working on various projects including the form and the interpretation of nominals, adjectival modification, verbal alternations, and the role of non-active morphology.

Manfred Bierwisch is Professor for Theory of Grammar at the Humboldt-University Berlin. He studied German philology and philosophy in Leipzig, and has served as Fellow of the Center for Advanced Study in the Behavioral Sciences, Stanford, Vice-President of the Berlin-Brandenburg Academy of Sciences, the Institute for Advanced Study. Bierwisch has also been the Head of the Max-Planck Research Group 'Structural Grammar' at the Humboldt-University Berlin (1992 to 1999). He is well known for his work in the fields of syntax and semantics, and has been one of the pioneers in introducing generative grammar in Germany.

Lisa Lai-Shen Cheng is Chair Professor of Linguistics at Leiden University, the Netherlands. Her research has three main focuses: comparative syntax (comparing the structure of Chinese languages, as well as the structure of Bantu languages), syntax–semantics interface (bare nouns, quantifiers, free choice items), and syntax–phonology interface (mapping between syntactic and phonological structure in Bantu languages).

Helen de Hoop (PhD Groningen, 1992) is Professor of Theoretical Linguistics at the Radboud University Nijmegen, the Netherlands. She has published (co-authored) articles in the journals *Linguistics and Philosophy*, *Journal of Semantics*, *Language Acquisition*, *Linguistics*, and *Lingua*. Together with Mengistu Amberber she has edited the volume *Competition and Variation in Natural Languages: the Case for Case* (Elsevier, Oxford, 2005) and, together with Peter de Swart, she has edited *Differential Subject Marking* (Springer, Dordrecht, 2008). With Petra Hendriks and Reinhard Blutner, she has written a book on Optimality Theory and interpretation (*Optimal Communication*, CSLI Publications, Stanford, 2006). In Nijmegen she is the principal investigator of several externally funded research projects, the topics of which vary from case and animacy to the behaviour of local pronouns in the languages of the world.

Henriëtte de Swart received her PhD in 1991 from Groningen University. After three years of teaching at Stanford University, she became full professor in French linguistics and semantics at Utrecht University in 1997. Her collaboration with Donka Farkas dates back to 2003, when they jointly published *The Semantics of Incorporation: from Argument Structure to Discourse Transparency* (CSLI Publications). She has also published articles in *Journal of Semantics*, *Natural Language and Linguistic Theory*, *Linguistics and Philosophy*, *Lingua*, *Journal of Pragmatics.*

Urtzi Etxeberria is a *Chargé de Recherche 2ème Classe* at the *Centre National de la Recherche Scientifique* (CNRS) at the Basque Texts and Language Study Centre (IKER) in Bayonne (France), and a member of the Basque Research Group in Linguistics (HiTT). He received his PhD in linguistics from the University of the Basque Country (EHU-UPV) in 2005. His research interests are focused on the syntax–semantics interface in general, and on the structure of nominals and quantifiers in Basque (as well as cross-linguistically).

Donka F. Farkas is Professor of Linguistics at UCSC (University of California Santa Cruz). Before joining the department in 1991, she held teaching positions at Yale University and Penn State University. She has worked on the formal semantics of noun phrases, mood, and their interactions. Farkas and de Swart are the co-authors of 'The Semantics of Incorporation', a 2003 CSLI monograph.

Anastasia Giannakidou (PhD 1997, University of Groningen) is Professor of Linguistics at the University of Chicago. She has studied philosophy of language and linguistics, and is the author of many articles in natural language semantics and syntax, on topics such as negative polarity, free choice, quantification, ellipsis, focus, tense, mood, and with emphasis on cross-linguistic variation. Her previous book *Polarity Sensitivity as (Non)Veridical Dependency* was published by John Benjamins in 1998.

Kook-Hee Gil is a lecturer in English literature, language and linguistics at the University of Sheffield. She was born in Taejon in Korea and later came to the UK to do her postgraduate studies. Her research areas comprise syntax (binding, scrambling, topic/focus, floating quantifiers), semantics (wh-indefinites, polarity items), and second language acquisition (acquisition of semantics), and she has worked on a variety of languages including Korean, Japanese, Chinese, Malayalam, and Tibetan.

Heidi Harley is Associate Professor of Linguistics at the University of Arizona, interested in morphology, syntax and semantics, and working within the Distributed Morphology framework. Specifically, her work has focused on argument structure and verbal and nominal morphology in English, Japanese, Irish, Italian, and Hiaki. She has published work in *Language*, *Linguistic Inquiry*, *Lingua*, and *American Speech*, among others.

Luisa Martí was awarded her PhD in linguistics from the University of Connecticut, USA, in 2003. She is currently a postdoctoral research fellow at the Center for

Advanced Study in Theoretical Linguistics at Universitetet i Tromsø, Norway, where she leads a project on the internal composition of indefinites in different languages. She has published several articles in semantics and its interfaces with other domains.

Lisa Matthewson is Associate Professor at the University of British Columbia. She has been conducting fieldwork on St'át'imcets (Lillooet Salish) since the early 1990s, and is primarily interested in nature and extent of cross-linguistic variation in semantics. Her research to date has focused on determiners, quantifiers, tense, aspect, modality, evidentiality, and presuppositions.

Louise Mcnally is Professor of Linguistics at Universitat Pompeu Fabra, Barcelona. She has worked on various aspects of nominal and adjectival semantics, the compositional semantics of modifiers, and the semantics–pragmatics interface. She is the author of *A Semantics for the English Existential Construction* (Garland, 1997) and co-editor, with Christopher Kennedy, of *Adjectives and Adverbs: Syntax, Semantics and Discourse* (Oxford University Press, 2008).

Omer Premiger got his introduction to linguistics at Tel Aviv University, where he received his MA in linguistics in 2006 under the co-supervision of Tal Siloni and Tanya Reinhart. From there, he moved on to the PhD program in linguistics at MIT. In addition to work on argument structure and nominalizations, Omer has worked on long-distance wh-movement in Hebrew, and on long-distance agreement and clitic-doubling in Basque.

Monika Rathert (PhD Tübingen, 2003) is Assistant Professor at the Institute of Cognitive Linguistics, Frankfurt/M. University and her research interests lie in morphosyntax (nominalizations, argumentlinking, possessive), semantics (tense, quantification, adverbs), and language and the law. Her books include *Textures of Time* (Akademie, 2004), *Sprache und Recht* (Winter, 2006); she has edited *Perfect Explorations* (Mouton, 2003) together with Artemis Alexiadou and Arnim von Stechow and *Formal Linguistics and Law* (Mouton, 2008) together with Günther Grewendorf. Her Habilitation thesis is on deverbal nominalizations in German and English.

Tom Roeper is Professor of Linguistics at the University of Massachusetts, Amherst. He has worked in the area of morphology seen as a part of syntax for thirty years, examining the role of syntactic operations in compounds, prefixation, middles, and implicit arguments. In addition, he has worked on theoretical and experimental approaches to the problem of language acquisition and is the author of *The Prism of Grammar* (MIT Press, 2007).

Tal Siloni (PhD Geneva, 1994) is Associate Professor in the Department of Linguistics at Tel Aviv University, Israel. Her major areas of research are theoretical syntax, syntax of Semitic and Romance languages, argument structure, and the theory of the lexicon. Her book *Noun Phrases and Nominalizations* was published by Kluwer Academic Publishers in 1997.

George Tsoulas is a senior lecturer in linguistics at the University of York. After an undergraduate degree in linguistics and literature at the University of Strasbourg he went on to study for a PhD at the University of Paris VIII. His research to date has focused on the syntax/semantics and syntax/pragmatics interfaces, and more specifically on issues of quantification, tense and modality, number and the count/mass distinction, topic/focus articulation, particles, and the nature of pronominal reference.

Angeliek van Hout (PhD University of Tilburg, 1996) is Assistant Professor of Linguistics at the University of Groningen. Her main research domain is first language acquisition, and a secondary one is the syntax-semantics interface of argument structure. Angeliek van Hout has published about the acquisition of tense and aspect and definiteness in Dutch, English, Polish, and Italian, as well as telicity in argument structure, unaccusativity, and (with Tom Roeper) nominalizations. She presently coordinates cross-linguistic research on the acquisition of tense and aspect involving some twenty languages in a large European collaboration (called COST A33).

Arnim von Stechow is Chair Professor Emeritus of General and Theoretical Linguistics at Tübingen University. He has worked on the situational dependence of reference, focusing on referential variation in pronouns, informativity and rigid designation. He also studied the structuring of propositional information, and provided a solution to the problem of logical omniscience based on his structured meaning approach. Von Stechow is maybe best known for his research on the architecture of the syntax/semantics interface, and he developed the first systematic model-theoretic interpretation of Chomskyan LFs. He is coeditor of the two HSK-Handbooks of Semantics and Syntax, and contributed many classical papers on lexical decomposition, comparatives, modality, tense and aspect, questions, focus, and attitudes.

Abbreviations

Acc	accusative
AdjP	adjective phrase
AdvP	adverb phrase
AgrO	object agreement phrase
AgrP	agreement phrase
AP	adjective phrase
AS	argument structure
Asp	aspect
AspP	aspect phrase
CaseP	case phrase
ClP	classifier phrase
CP	complementizer phrase
c-selection	categorial selection
Dat	dative
DKP	Derived Kind Predication
DM	Distributed Morphology
DP	determiner phrase
DRS	Discourse Representation Structure
DRT	Discourse Representation Theory
ECM	exceptional case marking
EPP	Extended Projection Principle
ERG	ergative
Ev	event argument
FCI	free choice item
FI	full interpretation
Gen	generic operator
GF	grammatical form
GQ	generalized quantifier
H	head

indef	indefinite
inf	infinitive
intr	intransitive
IP	inflectional phrase
Lex-Syn	Lexicon-Syntax
LF	logical form
Nom	nominative
NP	noun phrase
NPI	negative polarity item
NumP	number phrase
OT	Optimality Theory
PF	phonetic form
pl	plural
PP	prepositional phrase
Prt	particle
Q-Det	quantificational determiner
QP	quantifier phrase
QR	quantifier raising
SF	semantic form
sg	singular
Spec	specifier
s-selection	semantic selection
TP	tense phrase
tr	transitive
VoiceP	voice phrase
VP	verb phrase

This page intentionally left blank

1

The structure of quantifiers and nominalizations, and the role of the definite article

ANASTASIA GIANNAKIDOU AND MONIKA RATHERT

One of the most fruitful ideas in formal semantics has been the thesis that quantifier phrases (QPs) denote generalized quantifiers (GQs; Montague (1974), Barwise & Cooper (1981), Zwarts (1986), Westerståhl (1985), Partee (1987), Keenan (1987), Keenan & Westerståhl (1997), among many others). GQ theory initiated an exciting research agenda in the 1980s, and the decades that followed featured extensive studies of quantificational structures, with attention to the constituents of QPs, and their scopal properties. For many years the focus of inquiry was on English, but soon enough cross-linguistic research made obvious a spectacular variation (see, for example, the chapters appearing in Bach et al. (1995)) in the means and patterns of quantification across languages, suggesting that some fine-tuning, or perhaps even more radical modifications, of the classical theory are necessary.

The cross-linguistic turn highlighted some of the fundamental aspects of QP internal syntax and semantics, and major issues such as definiteness and indefiniteness, kind reference, number marking, partitivity, and the way presuppositions are built into the very meanings of quantifiers themselves have been rekindled. Under debate is currently whether the individual meanings and categorial status of QP constituents vary across languages, for example as suggested in Chierchia's *Nominal Mapping Parameter* (Chierchia (1998a,b)), or whether we want to revise our standard theory of the combinatorics in the QP structure (as suggested in Matthewson (2001)), perhaps by adding a level of domain restriction as a modification function (Giannakidou (2004), Etxeberria & Giannakidou (2008b)). Another important question is how to handle quantification with wh-indeterminates, i.e. wh-phrases that are used, especially in East and South Asian languages, in lieu of quantifiers accompanied by

certain particles. In all these discussions, the definite determiner D has been central. D is traditionally considered to be the vehicle of familiarity (Heim (1982)), uniqueness, and existence presupposition (Strawson (1950)), but in the more recent works it has been argued to materialize contextual domain restriction (Giannakidou (2004)), and introduce a context set (Westerståhl (1985)). D is also used for the formation of nominals that refer to kinds, i.e. for generic reference, and indeed obligatorily in this use in certain languages such as Greek, French, and Hungarian. Languages with wh-indeterminates lack expressions that can at first glance be identified as D, but it is possible to argue that the determiner function (i.e. some kind of plural or sum formation) is performed by the particle that accompanies the wh-indeterminate (as proposed, for example, in Giannakidou & Cheng 2006, and further developed in Cheng, this volume).

D was also shown to be central in nominalizations. Some nominalizations are categorially ambiguous, like the *-ing* forms in (1)–(3), and, for these, the syntactic nature is not always easy to determine (Alexiadou (2001), Rathert (2008)):

(1) *mixed nominalization*: John's careful hunting of the bear

(2) *gerund*: John's carefully hunting the bear

(3) *participle in the progressive*: John is hunting the bear

It has been suggested that syntactic nominalizations share with noun phrases (whether simple nouns or lexical nominalizations) the same external layer, the functional projection DP (Siloni (1997), Hazout (1995)). Within this programme of research, the discrepancies between noun phrases (especially event nominals) and syntactic nominalizations follow from the fact that noun phrases have an internal nominal structure, while syntactic nominalizations entail a verbal projection that is allowed to be dominated by the functional projection DP, as it lacks temporal specifications. The question is to what extent the nominal and verbal DPs (i.e. the ones that embed a VP rather than an NP) share certain characteristics, for example regarding presuppositions of existence or actualization.

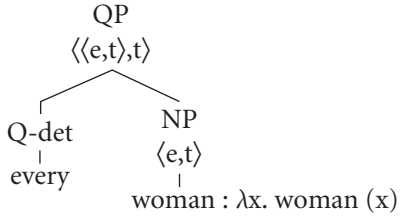
1.1 Quantification and definiteness

Classical generalized quantifier (GQ) theory (Barwise & Cooper (1981) and others) posits that, in order to form a quantifier phrase (QP), quantificational determiners (Q-dets) combine with a nominal (NP) argument of type *et*, a first-order predicate, to form a GQ. In a language like English, then, the syntax of a QP like *every woman* translates as follows:

(4) a. $[\![\text{every woman}]\!] = \lambda P.\ \forall x\ [\text{woman}\ (x) \rightarrow P(x)]$

b. $[\![\text{every}]\!] = \lambda P.\ \lambda Q.\ \forall x\ [P(x) \rightarrow Q(x)]$

c.



The Q-det *every* combines first with the NP argument *woman*, and this is what we have come to think of as the standard QP-internal syntax. The NP argument provides the domain of the quantifier, and the determiner expresses a relation between this set and the set denoted by the VP. Quantifiers like *every woman*, *most women* are known as 'strong' (Milsark (1977)), and their distinctive feature is that they cannot occur in the so-called existential *there* construction, illustrated below:

(5) a. #There are most women in the garden.

b. #There is {every/each} woman in the garden.

c. #There is the woman in the garden.

d. There are {three/some/few/several} women in the garden.

By contrast, quantifiers like *three women, some women, several women* ('weak' in Milsark's terminology) occur happily in this structure, as indicated. The question of what accounts for the empirical difference we observe in existential structures is still open, but it is important to note that weak quantifiers typically assert existence, rather than presupposing it (as definites or strong Q-dets often do). Existential quantifiers are typically intersective (Keenan (1987, 1996)): their Q-det denotes an intersection between the NP set and the VP set: *some* requires that the intersection be non-empty, *three* requires that it contain at least three members. Since Milsark's original study, the contrast between weak and strong quantifiers has been shown to be responsible for other grammatical phenomena, including also specificity phenomena and partitivity (de Hoop (1992), de Hoop (1997)). Weak and strong determiners have also recently been shown to behave differently with respect to the types of domain arguments they take cross-linguistically, e.g. Etxeberria (2005); Etxeberria (2008) reports that in Basque strong determiners combine with D, but weak determiners do not.

It has also long been noted that the domain of quantifiers is usually restricted. For instance, the sentence *Every woman talked to Bob* is not a statement about all the women in the universe, but about a particular set of women that the context of utterance makes salient. Much contemporary work agrees that we need to encode contextual restriction in the grammar somehow, but opinions vary as to whether contextual restriction is part of the syntax/semantics (Partee (1987), von Fintel (1994), Stanley & Szabó (2000), Stanley (2002), Martí (2003), Matthewson (2001), Giannakidou (2004), Etxeberria & Giannakidou (2008a)) or not (Recanati (1996), Recanati (2004), and others in the *strong contextualism* tradition). In the syntax-semantics tradition, it is assumed that the domains of Q-dets are contextually restricted by covert domain variables at LF. These variables are usually free, but they can also be bound, and they can be either atomic, e.g. C, or complex of the form $f(x)$, corresponding to selection functions (Stanley (2002), Martí (2003)):

(6) In my semantics class, every student passed the exam.

(7) $\forall x$ [student$_{C/f(x)}$] passed the exam.

In these examples, the nominal argument of $\forall$, *student*, is not the set of students in the universe, but the set of students in my semantics class. This is achieved by positing the domain variable C, which will refer to a contextually salient property, in this particular case the property of being in Anastasia's semantics class. This property then will intersect with the property *student*, and the product will be the (desired) set of students in Anastasia's semantics class. A natural prediction of the above approaches is that there may be overt strategies of encoding domain restriction in the syntax; indeed, this has been argued to be the case in Giannakidou (2004). Interestingly, Giannakidou argues that it is the D that introduces the domain restrictor set or function, echoing an earlier insight that the definite article introduces a context set (Westerståhl (1985)).

It has also been shown that, although the bulk of quantifier structures seems to support the idea that domain restriction via D occurs in the nominal argument, there is also evidence for Q-det itself composing with D – this is the case of the Greek determiner *o kathe*, lit. 'the every', meaning 'each', and Basque data involving strong Q-dets discussed in Etxeberria (this volume). Martí (2003) also composes the variable with the Q-det. Cross-linguistically, it seems, we must allow for both options – nominal as well as determiner restriction; in both cases, a definite D is involved.

The idea that D and DP are a central part of a QP structure raises additional questions in the larger cross-linguistic picture, and we elaborate here on what we see as the most important ones:

(a) If D is necessary for domain restriction or argument status (as argued in Chierchia (1998)), then how are these operations performed in languages *without* definite determiners (e.g. Navajo, Slavic languages), and in languages where bare NPs can occur as arguments (e.g. Chinese, Japanese, Korean)? For these languages, something must be said about the role of classifiers in performing the tasks under discussion, and often null Ds are posited (see Cheng & Sybesma (1999) for discussion).

(b) What happens if a language systematically employs D with all Q-dets? Such a language has recently been discussed by Matthewson (Matthewson (1999), Matthewson (2001)) – St'át'imcets Salish. In this language, all Q-dets combine directly with DP arguments, as indicated below, where D is the discontinuous element *i . . . a*:

(8) a. tákem [i smelhmúlhats-a]
all DET woman(PL)- DET
all the women

b. [QP Q-DET [DP D [NP N]]]

Matthewson (2001) takes this fact to challenge the classical GQ analysis that the domain of a Q-det is of type *et*, and instead she proposes that quantificational determiners combine with domains of type *e*, an entity. This proposal wants to capture the fact that, in such languages, the NP argument is always restricted, and deserves full consideration; yet, as a strong syntactic hypothesis, it makes what turns out to be questionable predictions about the languages that were better described by the classical GQ-theory (Giannakidou (2004)). For example, it renders problematic all Q-dets which are strictly forbidden to combine with DP arguments, like *every, three*, and all weak determiners, and it also forces a treatment of partitive *of* as semantically vacuous, which is very hard to maintain.

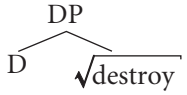
(c) How do we capture the fact that certain quantifiers appear to be at the opposite side of the spectrum, i.e. totally unrestricted? Such quantifiers have been described in the literature (Dayal (1998), Giannakidou (2001), Kratzer & Shimoyama (2002), Giannakidou & Cheng (2006)) as *free choice*, and their characteristic is that they come with a 'widened' domain that includes actual as well as possible individuals, and which has undergone some process of domain extension (or 'widening'). Interestingly, D can also be used for such quantifiers, e.g. in Greek and Mandarin Chinese (Giannakidou & Cheng (2006)). If D is necessary for domain restriction, then how is this to be reconciled with the use of D with unrestricted quantifiers?

(d) What is the role of number and number marking within the quantifier phrase? How does grammatical number relate to the mass versus count distinction, and what does this relationship tell us about the way quantificational determiners combine with their arguments? Exploring this question in detail has great potential, as it can shed light on the nature of classifiers, bare nominals, and their status as independent arguments.

1.2 Nominalization and definiteness

It is a well-known fact since Lees (1960) and Chomsky (1970) that verbs and nouns share fundamental complement-taking properties – nouns as well as verbs may take CPs, infinitives or PPs as complements. Lees explained this by postulating a proper sentence inside the NP. This approach is continued in current [DP[NP[VP]]] theories of nominalizations. Chomsky took a different route, proposing that a common abstract syntactic notation, *X-bar theory*, could represent both the structure of sentences and the structure of nominalizations. Chomsky's approach to nominalizations is continued in recent Distributed Morphology accounts, where 'lexical categories' like verbs and nouns are viewed as a combination of category neutral roots plus functional layers F. The obvious question is what F could be. A lot of research has been done on this, cf., for example, Harley & Noyer (1997), Harley & Noyer (1999), Harley & Noyer (2000), Alexiadou (2001), Marantz (1997), Rathert (2008). There is agreement that, in the verbal domain, F corresponds to little *v*. In the nominal domain, F is D; [*the enemy's destruction of the city*]$_{\text{NP}}$ contains this:

(9)



Adjustment rules in morphology will spell out a *destroy* that is governed by D as *destruction*.

Grimshaw (1990) established the famous distinction between *event nominals* and *result nominals*:

(10) *Event nominals:*

a. The examination of the patients took a long time.

b. *the barbarians' destroying

c. the barbarians' destroying of the city

d. the examination of the dog in/for an hour

e. Bill's intentional examination of the weak candidate

(11) *Result nominals*:

a. *The exam of the patients took a long time.

b. The exam is on the table.

c. *the exam of the student in/for an hour

d. *Bill's intentional exam of the weak candidate

Event nominals are event-denoting, cf. (10-a) where the duration of the examination event is measured with *took a long time*. Result nominals refer to the output of an event (11-b), not to the event itself (11-a). Event nominals are Θ-assignors like verbs; they have obligatory arguments (10-b,c). Another verbal feature of event nominals is the possibility of combining with aspectual modifiers (an observation going back to Vendler (1967)), as in (10-d). These modifiers are impossible with result nominals, cf. (11-c). Also, event nominals allow agent-oriented adverbials (10-e), while result nominals do not (11-d).

To account for these differences, Grimshaw proposes that event nominals have an external event argument *Ev*, whereas result nominals have an external referential argument *R*. However, there are nominalizations that denote events but behave like result nominals as they are incompatible with aspectual modifiers:

(12) *the event in an hour

Grimshaw captures the difference between (10) and (12) by postulating that the *complex event nominals* in (10) have argument structure, whereas the *simple event nouns* in (12) do not. Affixes like *-(at)ion* and *-ment* in English are ambiguous between introducing Ev (the event argument) or R (the referential argument). This is specified in the lexicon.

Grimshaw's lexical approach to the argument structure of complex event nominalizations is one way to go. Other researchers propose a syntactic solution – nominalizations can be built up prior to lexical insertion or in syntax directly. There are two possibilities of implementing a syntactic solution to the argument structure of nominalizations. The authors in this book represent both lines of research. Within the embedded-VP approach, we expect both accusative case assignment and adverbial modification. English data seem to be clear-cut, as derived nominals disallow adverbial modification and do not assign accusative; gerunds (complex event nominals with an embedded VP) behave differently, allowing adverbs and assigning accusative. Alexiadou (2001) has shown that Greek behaves like English in this respect: Greek permits adverbs in complex event nominals but disallows them in result nominals. Thus, cross-linguistic data support the embedded-VP approach.

However, evidence from Hebrew has put this approach into doubt. Siloni (1997, p. 76) argues that genuine adverbs can never modify Hebrew event nominals:

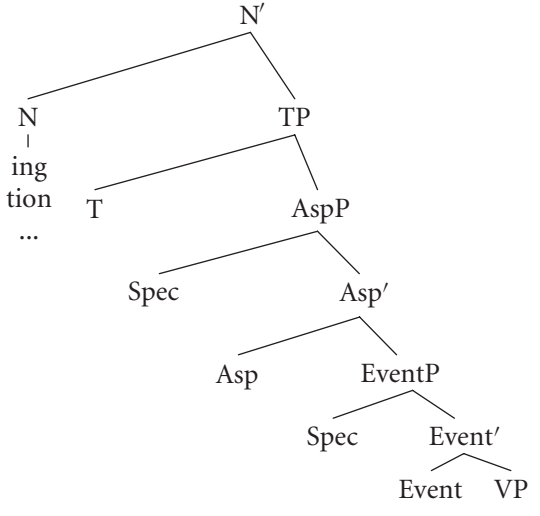
(13) a. * slilat ha-kviš le'at
paving the-road slowly

b. * clilat ha-yeled 'amukot
diving the-boy deeply

Instead, Hebrew has PP-adverbs with *bi/be*, suggesting a plain NP-analysis of event nominals. Siloni (1997, p. 84 ff.) also attacks the second pillar of the embedded-VP approach, namely accusative case assignment. She argues against Borer (1993) in claiming that the accusative case on the complements of Hebrew event nominals is not a structural case but an inherent one. The particle *'et* that marks accusative is crucial in her argumentation. When *'et* occurs with verbs, it demands definite objects. Event nominals can assign accusative only in the presence of *'et*, and the restriction on definite objects is also valid there. Under the embedded-VP approach, this restriction on the complements is unexpected, because the assignment of accusative case should be due to the presence of a verbal head.

Other researchers assume that argument structure with nominalizations is due to the presence of event structure represented in terms of functional projections, following Chomsky (1970). Among others, van Hout & Roeper (1998) suggest that this event structure is represented in terms of aspectual projections. In their system, nominalizations contain not only a VP, but also a vP/EventP (introducing the event interpretation of complex event nominals), an AspP (fixing telicity), and a TP (fixing the event entailment):

(14)



The difference between nominalizations denoting events and those not denoting events does not concern the VP. Instead, it concerns the presence/absence of functional structure above the VP level. Nominalizing affixes like *-ing/-tion* dominate TP, AspP, and EventP, whereas affixes like *-ee/-Ø* do not dominate such a fully fledged functional structure and thus do not have argument positions (although they contain a VP node).

Approaches like the one just sketched need to specify independent motivation for the assumed syntactic projections. What counts as evidence for functional layers inside nominalizations? In principle, three types of evidence could be used:

(a) Morphological evidence. In many languages, when roots are inserted in a phrase, they do not come 'bare', i.e. as mere stems. Rather, they are associated with inflectional (and derivational) morphology. Such morphology is not an intrinsic part of the lexical head as such, and it can be argued that it constitutes functional heads which embed the root.

(b) Distributional/syntactic evidence. This evidence relates to the distribution of the head in a given phrase (which may also be interpreted as evidence for functional projections). In addition, it relates to the type of adverbs that can be present in nominalizations across languages and it signals also the presence of verbal layers.

(c) Semantic evidence. Roots may be taken to express certain concepts, but, in the context of phrases, these 'lexical' concepts are associated with additional notions. The idea is then that these additional notions are encoded in functional heads that are associated with the 'lexical head' in question.

The contributions in this volume make use of all criteria to determine the structure of nouns. An important goal of this book is to bring these contrasting analyses together. It turns out clearly that D is central both in the embedded-VP approaches following Lees (1960) and in the more abstract accounts that invoke functional projections, following Chomsky (1970).

1.3 Overview of the volume

In this section, we present a brief overview of the main ideas expressed in the chapters of this volume.

Part I: Quantification

LISA MATTHEWSON's chapter *An unfamiliar proportional quantifier* investigates an element in St'át'imcets (Lillooet Salish) which appears to defy the division between weak and strong quantifiers – *nukw*. *Nukw* has been

described in the relevant literature as being an indefinite quantifier meaning 'some' or 'other' (van Eijk (1997)), and indeed DPs containing *nukw* display a range of initially puzzling syntactic and semantic behaviours; for example, like weak quantifiers, they are felicitous in existential sentences, but, unlike weak quantifiers, *nukw*-phrases are unambiguously proportional, and never just cardinal. Matthewson renders *nukw*-phrases parallel to English partitive *some (of),* and argues that a *nukw*-phrase always carries the meaning 'some, but not all'. With respect to familiarity, *nukw*-phrases also display dual behaviour: they may be used in out-of-the-blue, discourse-novel contexts, but also in anaphoric, definite contexts. The chapter provides a unified analysis of the various interpretations of *nukw,* and investigates the theoretical consequences of this analysis.

Among the most striking consequences is that the discourse-familiar aspect of English partitive *some* or *other* is missing entirely from the St'át'imcets constructions. If this analysis is correct, then the often-made link between proportionality and familiarity is challenged, and, once the conditions are specified under which proportionality and familiarity can be dissociated, obvious cross-linguistic predictions can be made. Matthewson's analysis also has some important consequences for the proper understanding of what counts as the defining property for an NP to be admitted to the existential construction. It is shown that the relevant property cannot be just intersectivity (as argued by Keenan), or presuppositionality (as argued by Zucchi (1995)). Instead, Matthewson comes to agree with McNally (1998) that the landscape of existential sentences is more diverse, and we cannot come up with a single generalization which accounts for all existential sentences in all languages. This conclusion, we believe, is important, as it agrees with similar positions in the literature that suggest variation in what counts as the relevant semantic property, for example in the licensing of polarity items (Giannakidou (1998)).

In her chapter *On* Every *type of quantificational expression in Chinese*, LISA CHENG addresses one of the central concerns of this book: how quantification proceeds in a language without quantificational determiners of the familiar English type. Cheng focuses on Mandarin Chinese and examines the two different ways of expressing *every* in this language. The first way involves the element *měi*, typically glossed as 'every', and the second way involves reduplicative classifiers. Both means of expressing *every* require the use of *dōu*, which is often glossed as 'all'. The chapter first reviews arguments from Giannakidou & Cheng (2006), where it is argued that *dōu* is a maximality operator, and performs functions that the definite article usually performs in a language like Greek. In the present chapter, the parallel between *dōu* and the definite determiner is further strengthened by novel data showing that *dōu*

provides contextual domain restriction, in particular, for strong quantifiers (just as in Basque, and to some extent Greek). This supports the proposal that *dōu* is a maximality operator, like a definite determiner. The chapter further presents data from both Mandarin and Cantonese showing that reduplicative classifiers are used only in a very restricted environment. It is argued that the difference between Mandarin and Cantonese in terms of the distribution of the reduplicative classifiers results from a more fundamental difference between the classifiers in these two languages.

An important implication of the idea that *dōu* is comparable to a definite determiner is that Chinese actually has a definite determiner. Unlike nominal determiners, however, *dōu* is generated outside the noun phrase. Such external determiners have been proposed by Sportiche (2001), Johnson (2000) for English; and the proposal put forth by Gil and Tsoulas in this volume suggests something similar for Korean. If Cheng's analysis is on the right track, it implies that, even for languages which do not seem to have a determiner inside the noun phrase, there are elements in the sentence which take up the determiner function.

The same kind of debate is at the heart of URTZI ETXEBERRIA's chapter *Contextually restricted quantification in Basque*. The author discusses a number of novel data from Basque, based on his 2005 PhD dissertation, illustrating that strong determiners such as *every* in this language are construed obligatorily with the definite determiner *-a*, whereas weak quantifiers like *few* and cardinals *two, five,* etc. are not. This result is taken to support the claim in Giannakidou (2004) that the definite determiner performs domain restriction. Etxeberria offers a novel compositional analysis for Basque strong quantifiers, where the QP internal definite determiner is a domain restrictor modifier function (type *et,et*), an idea generalized further in Etxeberria & Giannakidou (2008a). This finding enhances considerably our understanding of how domain restriction works, and also strengthens the conclusion that domain restriction happens systematically in grammar. The fact that in Basque the definite determiner does *not* combine with weak Q-dets is taken as evidence that these are neither quantifiers nor contextually restricted, in agreement with what has been often defended in the literature. Etxeberria proposes that weak determiners are base-generated as the predicative type and are cardinality predicates (building on, among others, Milsark (1979), Partee (1988), Diesing (1992), Landman (2003)).

Etxeberria's analysis provides further support for the conclusion that the standard analysis of generalized quantifiers – in particular the assumption that the Q-det selects a set argument – need not be revised (*pace* Matthewson (2001)), and the Basque quantificational data provide clear evidence that

domain restriction applies not only to the nominal argument but also to the determiner itself (Westerståhl (1985), Martí (2003), Giannakidou (2004)). The novel idea here is that D, as a domain restrictor, functions as a modifier of a determiner meaning, and that the determiner meaning that is modified must be strong.

LUISA MARTÍ, in her chapter *Contextual restrictions on indefinites: Spanish* algunos *vs.* unos, extends the possibility of determiner modification as domain restriction to *indefinite* determiners. It is argued that the Spanish plural indefinite *algunos*, an existential quantifier (see also Gutiérrez-Rexach (1999a), Gutiérrez-Rexach (1999b), Gutiérrez-Rexach (2001) and others), is also contextually domain restricted. Martí proposes that *alg-* introduces the C variable – an idea parallel to D introducing the C variable in the analyses of Giannakidou and Etxeberria. *Algunos* then is contrasted with *unos* which is claimed to be not inherently domain restricted. The chapter builds on the analysis of *unos* and *algunos* that is further developed in Martí (2008) and adds the layer of domain restriction to the 'indefinite hierarchy' defended in that study.

The novelty of Martí's proposal is that weak Q-dets, just like strong ones, can be contextually restricted. This proposal appears to be challenged by generic uses of *algunos* – which are possible, as mentioned in the chapter – and which, as generics, are prototycally non-restricted. Gutiérrez-Rexach also mentions non-proportional uses of *algunos* that do not follow immediately from the assumption that it is always domain restricted. However, it is useful to ponder on the question of whether weak quantifiers can be domain-restricted, and, if not, why not. If yes, how does domain restriction with a weak determiner differ from the more familiar case of strong determiners? It will be useful here to raise the question of specificity: is domain restriction with indefinites equivalent to the specific reading of indefinites? If not, how do they differ? These are questions that call for future investigation.

KOOK-HEE GIL and GEORGE TSOULAS's chapter tackles *Issues in quantification and DP/QP structure in Korean and Japanese.* Japanese and Korean are known to allow bare nominals in argumental positions (with either definite or indefinite interpretations), a fact that leads Chierchia to posit that bare NPs in these languages denote the argumental type *e*, and refer to either individuals or kinds. The chapter addresses three central and interconnected issues: (a) the structure of nominal phrases with special reference to the syntax of classifiers; (b) the proper treatment of *indeterminate*-based quantification, and (c) the question of the basic denotation of the bare nominal in these (and other similar) languages. At the heart of the discussion here is the issue of the basic lexical denotation of bare nouns in Korean and Japanese. Several

proposals in current research besides Chierchia have converged on the idea that the lexical denotations of nouns in languages like Japanese and Korean resembles most that of a mass noun in English. This statement, empirically, entails that these languages will lack plural (and perhaps number in general) morphology and that they will have a generalized classifier system.

Korean in fact does have a plural marker – *tul* – which, just like the English plural, does not combine with mass nouns, thus behaving indeed like a true plural. The fact that these languages allow plurals goes against Chierchia's idea that the nominal is uniformly like a mass noun; hence we cannot accept the nominal mapping parameter at face value. It thus becomes plausible to argue for additional structure inside the NP (as Cheng & Sybesma (1999) argued for Chinese, for example). Gil and Tsoulas are reluctant to allow the inner structure of bare argumental nominals to proliferate (as in Watanabe (2006)), and try to maintain a relatively simple syntax of the NP/DP in this language type. They conclude that classifiers, distributive markers, and number are indeed structurally represented – but as clausal projections. This assumption tries to remain faithful to the idea that nominal phrases in these languages are somehow bare in a real sense.

Part II: Definiteness

The interpretation of weak quantifiers is the topic of LOUISE MCNALLY's chapter *Properties, entity correlates of properties, and existentials.* McNally's main goal is to compare the entity approach to properties (i.e. Chierchia's treatment of nominalizations as an *e* type object similar to the Carlsonian kind) to the function approach which treats properties as sets (*et* functions; McNally's earlier work, van Geenhoven (1998), Chung & Ladusaw (2004), Farkas & de Swart (2003), and others). Existential structures provide a suitable testing ground for observing empirical differences between the two approaches. McNally's discussion has two important consequences. First, it serves as a reminder that there might be cross-linguistic (and even within-language) variation in the semantics of existence statements – a point that was also emphasized in Matthewson's chapter, as we saw. The diagnostics used for *there*-sentences, coupled with relatively conservative theoretical assumptions, predict three general patterns of variation which appear to be attested. Second, the analysis makes use of entity correlates of properties outside of the domain of generics/bare nominals, thus raising questions for future research about how entity correlates of properties and kinds are related.

DONKA F. FARKAS and HENRIËTTE DE SWART in their chapter *Stability and variation in article choice: generic and non-generic contexts* address article

choice in non-generic contexts and in singular generics within Optimality Theoretic Semantics. This chapter is part of their larger programme, and focuses on languages containing definite and indefinite articles – English, Dutch, French, Spanish, Greek, and Hungarian. The main question is: Why is the use of the definite article obligatory in some languages (e.g. French, Greek, and Hungarian) in order to refer to kinds, but in others (English, Dutch, and other Germanic languages), reference to kinds can be done simply by using a bare NP? Farkas and de Swart adopt the system of constraints independently proposed in Hendriks et al. (2007) supplemented by two new constraints that take into account the two components of *determined* reference: maximality and familiarity. Plural generic NPs introduce maximal and non-familiar variables. The contrast between the two language groups reduces to the fact that in the Germanic type the non-familiar feature blocks the use of a definite form while in Romance/Hungarian/Greek it does not.

When comparing non-generic contexts and generic singulars, it is important to note that in the former case the article is the only vehicle that can encode determined reference, while in generic sentences the nature of the interpretation of the variable is encoded in the generic operator. In the case of singular generics, the use of the indefinite form in all the languages under consideration is connected to the clash between uniqueness (associated with definite singular forms) and the property of being bound by a generic operator. In the account that emerges, article choice is a matter that binds together the number of the NP and the semantic environment in which it occurs.

ARNIM VON STECHOW's chapter *The temporal degree adjectives* früh(er)/spät(er) *'early(er)'/'late(r)' and the semantics of the positive* addresses issues that are tightly connected with definiteness and quantification. There is a rich literature about *before/after*, but almost nothing about *earlier/later*. The chapter develops a degree semantics for the antonyms *früh* 'early' and *spät* 'late' and derives the meanings of the comparative forms for these adjectives. Von Stechow defines a new positive operator *Pos* that applies to the positive and the negative pole of antonyms. Each context determines a delineation interval L that separates the negative from the positive pole of an antonym pair. *Pos* applied to a set of degrees D says that D holds of every degree in the interval L. This chapter interacts with the chapters on quantification because it argues that quantification over contexts is not needed for the comparative – instead, there must be quantification in the positive. Most accounts (like Kamp (1975), Lewis (1972)) regard the positive as the basic notion. The comparative is usually derived from the positive via universal quantification over contextually given delineations. In von Stechow's view, however, there is a contextually

given delineation interval L_c between polar opposites; L_c is a dense interval of degrees. The positive is a universal quantifier stating that the degree predicate is true of every d in L_c.

In her chapter *On (in)animate noun phrases,* HELEN DE HOOP suggests that the animacy of noun phrases affects their 'prominence', and that in this sense animacy is comparable to definiteness. 'Prominence' is best known as a functional-typological notion that plays a role in voice alternations (cf. Givon (1994), Aissen (1999)). As such, it is determined by a range of different factors, including definiteness, referentiality, animacy, person, topichood. An argument can be prominent due to its inherent properties or because of its status in the discourse. Definite noun phrases can be argued to be prominent inherently, but not all definites are equally prominent (Anagnostopoulou & Giannakidou (1995)), and this led to the introduction of so-called 'prominence hierarchies' or 'prominence scales'. Prominence and definiteness are significant for many phenomena in language, and are typically the notions called upon for the treatment of clitic (or other) left dislocations and clitic doubling in European languages such as Greek, Romance, and Germanic.

In order to investigate the similarities and differences between animacy and definiteness, de Hoop focuses on the phenomenon of differential object marking. She explores the idea of animacy as a matter of prominence, and proposes that there is a difference between preferred (basic) interpretations of animate versus inanimate noun phrases. This can then be captured by a (violable) constraint of basic interpretations. Ultimately, the conclusion is that it is unrealistic to assume that differential object marking, triggered by the animacy of the noun phrase, could be reduced to the presence of a DP layer. Therefore, apart from striking similarities between animacy and definiteness, we must also allow certain differences between the two.

Part III: Nominalization

ARTEMIS ALEXIADOU in her chapter *On the role of syntactic locality in morphological processes: the case of (Greek) derived nominals* addresses one of the most important issues in connection with nominalization: argument structure. There is consensus (Grimshaw (1990), Bierwisch (1990), Borer (2003b)) that in order for a noun to have argument structure, this noun must have been a verb at some point in its derivational history. This suggests that in languages with verbalizing morphology, nominal morphology should appear at the outside of the verbalizing markers and these derived nominals should always (i) bear meanings related to their verbal source and (ii) have argument structure. This prediction is even stronger in frameworks like *Distributed*

Morphology that take elements such as noun and verb to have no universal significance and to be essentially derivative from more basic morpheme types. However, it is also known that deverbal nominals are multiply ambiguous; they may have a 'simple' event reading or a result reading, both readings under which the nominal lacks argument structure and behaves like a referential nominal. Even more striking is the fact that zero derived nominals in English seem to lack argument structure, although they are so very much like verbs. Building on data from English and Greek nominalizations, Alexiadou shows that in cases where nominal affixes attach outside verbalizing affixes, the result is compositional and verbal in meaning.

Furthermore, Alexiadou argues that we have to distinguish between verbalizers and layers introducing arguments. Nouns having argument structure and referential nouns share the same basic verbal structure, i.e. contain *v* in addition to the root. This in turn means that derived nominals may have a verbal source, but this is not directly linked to their ability to license argument structure. Alexiadou proposes that the optionality of argument structure in the nominal domain has to do with the presence of NumberP in combination with a particular (aspectual) type of verbal structure. A nominal internal structure is characterized by the presence of nominal functional projections below D. A verbal internal structure is characterized by the presence of verbal layers below D. A mixed internal structure contains both nominal and verbal layers and nominals with that structure show a mixed behaviour. The main claim is that these nominals that have a mixed internal structure (verbal and nominal) are those that are ambiguous between argument structure and non-argument structure readings (Alexiadou (2007), Iordachioaia & Soare (2007), see also Malouf (2000)).

The chapter *Nominalization – lexical and syntactic aspects* by MANFRED BIERWISCH argues against syntactic approaches such as Alexiadou's in that it views nominalization – like other derivational processes – as an essentially lexical process with well-defined syntactic consequences. As typical of lexical processes, the relation between a verb and the noun derived from it is subject to both systematic and idiosyncratic conditions. Bierwisch shows that Grimshaw's three-way distinction for deverbal nouns between event nominals with argument structure, simple events without arguments, and result nominals is neither exhaustive concerning the different options, nor complete and correct with respect to their respective properties, especially for plural formation. Given the general principles of coercion and/or conceptual shift, the most plausible account for the different interpretations of nominalizations seems to be extending these principles to the products of derivational morphology, with consequences for the saturation of argument positions as expected.

Bierwisch shows that nominalization must be recognized as drawing on systematic principles as well as on idiosyncratic information. More specifically, the lexical aspect of nominalization relates to the role of idiosyncratic information, but also to the conditions on underspecification, which crucially apply to lexical information. The syntactic aspect on the other hand comes in through the combination of heads and complements (or adjuncts) and its semantic consequences, but also through the surface conditions that control, among others, the realization of argument positions the lexical entries provide.

HEIDI HARLEY in *The morphology of nominalizations and the syntax of* v*P*, like Alexiadou's chapter, investigates Distributive Morphology proposals for the analysis of English verbal morphology. She then proceeds to Distributive Morphology analyses of event nominalization versus result and process nominals. The challenge the result interpretation of complex event nominalizations poses to a Distributed Morphology analysis was first laid out in detail in Borer (2003a), Ackema & Neeleman (2004), and is taken up in Harley's contribution. The chapter first explores the internal structure of event nominalizations by considering the syntax of verb-particle constructions and their behaviour in mixed nominalizations (following Harley & Noyer (1997)). Then, an analysis of particular verbalizing morphemes (*-ify*, *-ize*, *-en*, and *-ate*) is proposed, identifying them as underspecified spell-outs of an eventive v° head. These two analyses jointly lead to a conclusion about the internal structure of the VP, namely that it must include at least three projections: Voice, v, and $\sqrt{}$. Finally the problem of how to derive a result nominalization from the event nominalization is considered, given the necessary conclusion, for DM, that even on the result interpretation these nominals have verbal syntactic structure contained within them. It is proposed that the delimiting nature of a null 'Packager' head in the count result nominals precludes the presence of a measuring-out direct object, as it would represent the overapplication of boundedness-deriving devices.

THOMAS ROEPER and ANGELIEK VAN HOUT's chapter *The representation of movement in* -ability *nominalizations. Evidence for covert category movement, Edge phenomena, and local LF* has interesting minimalist claims regarding nominalizations, patterning very well with Alexiadou's and Harley's approach. Two questions are prominent in modern minimalist discussions: how abstract are the principles which govern grammar, and how far do syntax and the lexicon penetrate one another? Roeper and van Hout's argument pivots upon the clear contrast between *the learnability of grammar by children* versus **children's learnability of grammar* (whereas *the grammar's learnability by children* is fine again). This argument realization pattern is precisely the

same as the restriction on the subject of a verbal passive. Since *-ability* nominalizations seem to coerce the same thematic restrictions on the DP specifier position as the passive does on the TP subject position, the authors argue that the specifier position is the long-distance subject of the underlying verb.

Roeper and van Hout propose a passive operation for *-ability* nominalizations which entails covert phrasal movement, displays a 'long-distance' connection to an Edge, is LF-sensitive and fulfils the Chain Condition (following Chomsky (2001), Pesetsky (2000), and Frampton & Gutman (2000), Fu et al. (2001), van Hout & Roeper (1998), Roeper & van Hout (1999)). The authors' argument moves in the same direction as other discussions of CP/DP parallelism (Chomsky (2005), Hirawa (2005), Svenonius (2004)).

An underlying general hypothesis is compatible with the view in Bierwisch's chapter: different affix types have a different control on argument structure. The consequence of this account, however, directly contradicts Bierwisch: nominalizations, i.e. DPs, are equivalent to clauses.

TAL SILONI and OMER PREMINGER, finally, with their chapter *Nominal voices*, extend Roeper's discussion of passive nominalizations by addressing the issue of cross-linguistic voice alternations within nominalizations. Drawing data from many languages (Hebrew, Hungarian, Russian, French, among others), the authors demonstrate that there is robust cross-linguistic variation regarding the voices available for event nominals, which contrasts sharply with the availability of these voices for verbs.

Only unaccusative and subject-experiencer nominals are possible in all the languages under consideration; all other voices are restricted in application. Reflexive and reciprocal nominals are possible in certain languages (Hebrew, Hungarian, Russian) but not in others (Romance, Serbo-Croatian). There are no passive nominals morphologically coded as passives. This is very conspicuous in Hebrew, where the verbal passive templates do not have corresponding nominal templates. The explanation for this involves lexical arity operations which can feed nominalization. Thus, languages that set the Lexicon-Syntax Parameter (Reinhart & Siloni (2005)) on 'lexicon' always have reflexive and reciprocal event nominals. Languages that set the parameter on 'syntax' have reflexive and reciprocal nominals only if their morphology is compatible with nominals. Given that nominalization applies in the lexicon (Siloni (1997)), reflexive and reciprocal event nominals will be available only if reflexive and reciprocal entries exist themselves in the lexicon (and are thus available to feed nominalization).

Predictably, in languages where it has been independently established that reflexivization and reciprocalization apply in the syntax (Reinhart & Siloni (2005), Siloni (2008)), reflexive and reciprocal event nominals are predictably

impossible. In languages where it has been independently established that reflexivization and reciprocalization apply in the lexicon, such event nominals are possible. Decausative nominals are predicted to be possible across languages as their formation is lexical. Finally, there are no passive nominals with passive morphology because nominalization involves arbitrary saturation.

The account achieves empirical coverage which appears unavailable for models assuming a 'single generative engine' (and specifically, accounts banning a computationally active lexical component). Siloni and Preminger's chapter patterns well with Bierwisch's in strengthening the role of the lexicon.

This page intentionally left blank

Part I
Quantification

This page intentionally left blank

2

An unfamiliar proportional quantifier

LISA MATTHEWSON[1]

2.1 Introduction

This chapter investigates an element in St'át'imcets (Lillooet Salish) which appears to straddle the divide between weak and strong quantifiers. This element, *nukw,* is described by Eijk (1997: 131, 263) as being an indefinite quantifier meaning 'some' or 'other'. Some examples are given in (1)–(2).[2]

(1) Lh-núkw-as wa7 t'it n-q'áy-lec [i *núkw*-a
HYP-nukw-3CONJ IMPF also LOC-run.away-AUT [DET.PL *nukw*-DET
sk'wemk'úk'wmi7t].
children]
'Sometimes some children would run away.' (Matthewson (2005: 208))

[1] Many thanks to St'át'imcets consultants Gertrude Ned, Laura Thevarge, Rose Agnes Whitley and the late Beverley Frank. I am very grateful to Henry Davis, Anastasia Giannakidou, Hotze Rullmann, and two anonymous reviewers for comments on previous versions of this chapter. Thanks also to audiences at the QP/Nom/DP Workshop in Saarbrücken and the Workshop on Structure and Constituency in Languages of the Americas 11 for helpful feedback. Finally, thanks to Anastasia Giannakidou and Monika Rathert for their patience and guidance. Errors are my own. Fieldwork is supported by SSHRC grants #410-2002-1715 and #410-2005-0875. Data are presented in the practical orthography of the language developed by Jan van Eijk.

[2] Abbreviations: ACT = active intransitivizer, APPL = applicative, AUT = autonomous intransitivizer, CAUS = causative, CIRC = circumstantial modal, CONJ = conjunctive, DEIC = deictic, DET = determiner, DIR = directive transitivizer, ERG = ergative, FOC = focus, HYP = hypothetical complementizer, IMPF = imperfective, LOC = locative, OBJ = object, PASS = passive, PL = plural, POSS = possessive, NEG = negation, NOM = nominalizer, REDUP = reduplication, REPORT = reportative, STAT = stative, SUBJ = nominative subject.

(2) Wa7 sqwal'-en-túmulh-as tákem i qwámqwmet-a wa7
IMPF tell-DIR-1PL.OBJ-3ERG all DET.PL fun-DET IMPF
száyten-s [i *núkw*-a úcwalmicw].
business-3POSS [DET.PL *nukw*-DET person]
'She would tell us all the fun things the other people were doing.'
(Matthewson (2005: 79))

DPs containing *nukw* display a range of initially puzzling syntactic and semantic behaviours. They are felicitous in existential sentences, which suggests that they are weakly quantificational and should pattern with English DPs containing weak *some (s'm)*. However, *nukw*-phrases are unambiguously proportional rather than cardinal; I will argue that a *nukw*-phrase always carries the meaning 'some, but not all'. In this respect, *nukw*-phrases parallel English partitive *some (of),* which many researchers take to be excluded from existential sentences. With respect to familiarity, *nukw*-phrases also display dual behaviour: they may be used in out-of-the-blue, discourse-novel contexts, but also in anaphoric, definite contexts.

The goals of this chapter are to provide a unified analysis of the various interpretations of *nukw,* and to investigate the theoretical consequences of the analysis. I will argue that *nukw* encodes only the proportional ('not all') aspect of English partitive *some* or *other,* and that this aspect of meaning is a presupposition. The existential force of *some* or *other* is achieved in St'át'imcets by an obligatorily co-occurring determiner. Finally, the discourse-familiar aspect of English partitive *some* or *other* is missing entirely from the St'át'imcets constructions.

The data and analysis presented here suggest that, at least for St'át'imcets, neither Zucchi's (Zucchi (1995)) nor Keenan's (Keenan (2003)) analysis of the definiteness effect with existential sentences can be correct. However, McNally's (McNally (1998)) approach has the potential to work for St'át'imcets. The *nukw* data confirm that, contrary to what is sometimes assumed, the notions of proportionality and familiarity are not necessarily linked in the denotations of quantifiers (cf. also de Hoop (1995) on Dutch). Finally, the analysis of *nukw* provided here contributes to the growing body of evidence that there are no phenomena in St'át'imcets which involve familiarity presuppositions (cf. Matthewson (1998) for determiners, Davis et al. (2004) for clefts, and Matthewson (2006) for presupposition triggers).

The structure of the chapter is as follows. In section 2.2 I discuss the syntactic behaviour of *nukw* and propose that *nukw* is a modifier to D. In section 2.3, I present the semantic data and generalizations. Section 2.4 provides the analysis, and section 2.5 addresses the theoretical consequences.

2.2 The syntax of *nukw*

In this section I show that *nukw* does not pattern syntactically with either weak or strong quantifiers. I argue that it is a modifier to D. I begin with some basic background on St'át'imcets determiners.

2.2.1 *Background on determiners*

All argument DPs in St'át'imcets are introduced by an overt determiner. Bare plurals or bare mass nouns are not grammatical, as shown in (3) and (4).

(3) a. Lexlex [*i* smelhmúlhats-*a*].
intelligent [*DET.PL* woman(PL)-*DET*]
'The/some women are intelligent.'

b. *Lexlex [smelhmúlhats]
intelligent [woman(PL)]

(4) a. Wa7 ts'aqw-an'-ítas [*i* t'éc-*a*] [*i* míxalh-*a*].
IMPF eat-DIR-3PL.ERG [*DET.PL* sweet-*DET*] [*DET.PL* bear-*DET*]
'The/some bears eat honey.'

b. *Wa7 ts'aqw-an'-ítas [t'ec] [i míxalh-a].
IMPF eat-DIR-3PL.ERG [sweet] [DET.PL bear-DET]

Most St'át'imcets determiners contain both a proclitic and an enclitic portion. The proclitic portion immediately precedes, and the enclitic portion immediately follows, the first prosodic word in a DP.[3]

2.2.2 *Syntactic behaviour of* nukw

The translations given for *nukw* might lead us to suspect that it is a quantifier. In many cases, the syntactic behaviour of *nukw* is consistent with such an assumption. For example, *nukw* in (5a) appears in a parallel position to the quantifiers in (5b) and (5c).

(5) a. Lexlex [i *núkw*-a sk'wemk'úk'wmi7t].
intelligent [DET.PL *nukw*-DET children].
'Some of the children are intelligent.'

b. Lexlex [i *tákem*-a sk'wemk'úk'wmi7t].
intelligent [DET.PL *all*-DET children]
'All children are intelligent.'

[3] Things are slightly more complicated; Davis (2000) has shown (on the basis of coordination facts) that the pro- and enclitic portions of the determiner occupy different projections. The relevant point for current purposes is that the placement of the enclitic portion is prosodically determined and therefore does not provide a direct window into syntactic structure.

c. Léxlex [i *cw7ít*-a sk'wemk'úk'wmi7t].
intelligent [DET.PL *many*-DET children]
'Many (of the) children are intelligent.'

However, further data reveal that *nukw* behaves neither like a weak, nor like a strong quantifier. Unlike strong quantifiers, *nukw* may not precede the determiner in argument position.

(6) a. Wa7 tayt [*tákem* [i sk'wemk'úk'wmi7t-a]].
IMPF hungry [*all* [DET.PL children-DET]]
'All (of the) children are hungry.'

b. *Wa7 tayt [*cw7it* [i sk'wemk'úk'wmi7t-a]].
IMPF hungry [*many* [DET.PL children-DET]]
'Many (of the) children are hungry.'

c. *Wa7 tayt [*nukw* [i sk'wemk'úk'wmi7t-a]].
IMPF hungry [*nukw* [DET.PL children-DET]]
'Some (of the) children are hungry.'

Unlike weak quantifiers, *nukw* may not function as a main predicate.

(7) a. **Tákem* [i sk'wemk'úk'wmi7t-a]$_{DP}$.
all [DET.PL children-DET]
'There are all the children.' [Literally: 'The children are all.']

b. *Cw7it* [i sk'wemk'úk'wmi7t-a]$_{DP}$.
many [DET.PL children-DET]
'There are many children.' [Literally: 'The children are many.']

c. **Nukw* [i sk'wemk'úk'wmi7t-a]$_{DP}$.
nukw [DET.PL children-DET]
'There are some children.' [Literally: 'The children are some.']

Unlike weak quantifiers, *nukw* may not function as an adjective modifying a nominal predicate.

(8) a. *[*Tákem* sk'wemk'úk'wmi7t]$_{PRED}$ [i wa7 tayt]$_{DP.}$
[*all* children] [DET.PL IMPF hungry]
'The ones who are hungry are all the children.'

b. [*Cw7it* sk'wemk'úk'wmi7t]$_{PRED}$ [i wa7 tayt]$_{DP.}$
[*many* children] [DET.PL IMPF hungry]
'The ones who are hungry are many children.'

c. *[*Nukw* sk'wemk'úk'wmi7t]$_{PRED}$ [i wa7 tayt]$_{DP.}$
[*nukw* children] [DET.PL IMPF hungry]
'The ones who are hungry are some children.'

Unlike both weak and strong quantifiers, *nukw* may not appear in a fronted position.

(9) a. [*Tákem* i sk'wemk'úk'wmi7t-a]$_i$ q'uq'wts t$_i$.
[*all* DET.PL children-DET] fat
'All the children are fat.'

b. [*Cw7it* i sk'wemk'úk'wmi7t-a]$_i$ q'uq'wts t$_i$.
[*many* DET.PL children-DET] fat
'Many children are fat.'

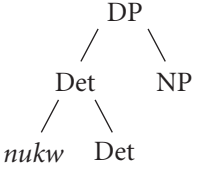
c. *[*Nukw* i sk'wemk'úk'wmi7t-a]$_i$ q'uq'wts t$_i$.
[*nukw* DET.PL children-DET] fat
'Some children are fat.'

In summary, *nukw* has a unique syntax within St'át'imcets. It cannot syntactically be classified with either the strong or the weak quantifiers. Nor can it be classified as an adjective, since adjectives function as main predicates.[4] There are no other DP-internal elements which resemble *nukw* in their syntactic behaviour. We therefore need a custom-made analysis for *nukw.*

2.2.3 *Syntactic analysis*

The data in (8) above showed that we cannot treat *nukw* as combining as a sister to the noun; *nukw* is parasitic on the presence of a determiner. Nor can we treat *nukw* as combining with the whole DP, as strong quantifiers do; this was shown in (6) and (9). I conclude that *nukw* composes first with D and then with N. It is thus syntactically a modifier to D. We will also see semantic arguments for this claim below. The structure proposed is given in (10).[5]

(10)



The existence of determiner modifiers has independently been argued for by Giannakidou (2004) and by Etxeberria (Etxeberria (this volume), Etxeberria (to appear)) for Greek and Basque respectively. In both Greek and Basque,

[4] Adjectives and weak quantifiers pattern alike in all respects, except that adjectives are ungrammatical in the constructions in (9).

[5] The surface linear order of elements is achieved by the cliticization of the two parts of the determiner to *nukw*; see the end of section 2.2.1 above.

a definite article which performs domain restriction is argued to compose directly with a strong quantifier. For example, in Greek, *o kathe* – lit. 'the every' – combines to mean 'each'.

The parallel between St'át'imcets and Greek/Basque is intriguing, but not perfect. Note that, unlike in the Greek and Basque cases, the article in St'át'imcets is not combining with a quantifier. As argued in section 2.2.2, *nukw* is not a quantifier; see also the non-quantificational semantic analysis of *nukw* in section 2.4. I have certainly argued elsewhere for an analysis of real quantifiers in St'át'imcets whereby a domain-restricting determiner co-occurs with the quantifier (Matthewson (2001)). However, contra Giannakidou (2004), Etxeberria (this volume), Etxeberria (to appear), I do not analyse those St'át'imcets truly quantificational cases as syntactically involving a determiner-adjunction structure as in (10). See Matthewson (1998), Matthewson (2001) for data and discussion.[6]

2.3 The semantics of *nukw*

In this section I provide data and generalizations concerning the semantics of phrases containing *nukw.* I begin with some basic background on the semantics of the determiners and on existential sentences in St'át'imcets.

2.3.1 *Semantic background*

Apart from the polarity determiner *ku,* which cannot be used in anaphoric contexts, all St'át'imcets determiners are underspecified for familiarity and can be used in both familiar and novel discourse contexts. This is illustrated in (11); see Matthewson (1998), Matthewson (1999) for more data and discussion.

(11) a. Húy'-lhkan ptakwlh, ptákwlh-min lts7a [*ti*
going.to-1SG.SUBJ tell.story tell.story-APPL here [DET
smém'lhats-a]. . . .
*girl-*DET]
'I am going to tell a legend, a legend about a girl$_i$ . . . ' *(novel)*

b. . . . wa7 ku7 ílal láti7 [*ti smém'lhats-a*].
. . . IMPF REPORT CRY DEIC [DET *girl-*DET]
'. . . The girl$_i$ was crying there.' *(familiar)* (Eijk & Williams (1981: 19))

[6] The case for domain restriction directly on a quantifier does appear to be growing. Martí (this volume) argues that, in Spanish indefinite *algunos,* the quantificational element *alg-* combines directly with a contextual domain restriction. And Cheng (this volume) argues that *dōu* in Chinese is a definite determiner which provides a domain restriction for a co-occurring quantifier.

The determiners introduce the equivalent of widest-scope existential quantification. The wide-scope existential properties of the determiners are illustrated in (12) with respect to negation, and in (13) with respect to a quantified phrase; (13) is a case of scope-taking across an island boundary.

(12) Cw7aoz kw-s áz'-en-as [*ti sts'úqwaz'-a*] kw-s
NEG DET-NOM buy-DIR-3ERG [DET *fish*-DET] DET-NOM
Sophie.
Sophie
'Sophie didn't buy a fish.' (= 'There is a fish which Sophie didn't buy.')
= ∃x [fish (x) & ¬ [buy (Sophie,x)]]
≠ ¬ [∃x [fish (x) & buy (Sophie,x)]] (Matthewson (1999))

(13) [Tákem i wa7 tsunám'-cal] cuz' wa7 qwenúxw-alhts'a7
[all DET.PL IMPF teach-ACT] going.to IMPF sick-inside
lh-káw-lec-as [*ta twíw't-a*].
HYP-far-ACT-3CONJ [DET *youth*-DET]
'Every teacher will be sad if a child quits.'

i. Accepted in widest-scope context: There is one child, who every teacher doesn't want to leave.

ii. Rejected in intermediate-scope context: For each teacher, there's one child who they don't want to leave.

iii. Rejected in narrowest-scope context: Every teacher will be sad if any child leaves. (Matthewson (1999))

The exact mechanism for achieving the widest-scope existential effect is not critical here. In Matthewson (2001) I utilized free choice function variables which receive their value from the assignment function; I shall assume that analysis here.

Existential sentences show a strong/weak quantifier contrast in St'át'imcets, as shown in (14).

(14) a. Wa7 [ti míxalh-a] [láku7 sqwém-a].
be [DET bear-DET] [DEIC mountain-DET]
'There is a bear on that mountain.'

b. Wa7 [i míxalh-a] [láku7 sqwém-a].
be [DET.PL bear-DET] [DEIC mountain-DET]
'There are bears on that mountain.'

c. Wa7 [i *cw7ít*-a míxalh] [láku7 sqwém-a].
be [DET.PL *many*-DET bear] [DEIC mountain-DET]
'There are many bears on that mountain.'

d. *Wa7 [*tákem* i míxalh-a] [láku7 sqwém-a].
be [*all* DET.PL bear-DET] [DEIC mountain-DET]
*'There are all (the) bears on that mountain.'

2.3.2 *The semantics of* nukw*-phrases*

In this section I outline the range of contexts in which *nukw* is licit. I argue that *nukw* is an unambiguously proportional element, but that it is not specified for familiarity.

The first set of contexts in which *nukw* is licit are all those in which English uses *other*. These are all familiar contexts, in the sense that some previous discourse referent(s) must have been introduced (or accommodated). The examples of 'other' uses of *nukw* in (15)–(18) are all from spontaneously offered oral narratives.

(15) ... múta7 kw s-ka-kwan-ens-túm-a lhel-ki
... and DET NOM-CIRC-take-DIR-1PL.ERG-CIRC from-DET.PL
musmus-lhkálh-a múta7 [i *núkw*-a spzú7-lhkalh] wá7
cow-1PL.POSS-DET and [DET.PL *nukw*-DET animal-1PL.POSS] be
l-ti tmícw-lhkalh-a.
in-DET land-1PL.POSS-DET
'[Whatever they couldn't grow on our land] or get from our cows and the other animals on our land.' (Matthewson (2005: 105))

(16) Nilh s-k'wík'wena7-s t'u7 i wa7
FOC NOM-few-3POSS just DET.PL IMPF
ka-kan-s-twítas-a ts'i7 múta7 sts'úqwaz' múta7
CIRC-can-CAUS-3PL.ERG-CIRC meat and fish and
[i *núkw*-a s-q'wel s-7ílhen].
[DET.PL *nukw*-DET STAT-cook NOM-eat]
'So they could only can a few cans of fish and meat and other cooked food.' (Matthewson (2005: 146))

(17) Plan wa7 qelhmín [ti pápel7-a smúlhats].
already IMPF old [DET one(human)-DET woman]
'One woman was already old.'
Cw7aoz kw s-ts'íl.h-as kw s-qelhmín-s [ta *núkw*-a
NEG DET NOM-like-3CONJ DET NOM-old-3POSS [DET *nukw*-DET
smúlhats].
woman]
'The other woman didn't seem very old.' (Matthewson (2005: 59))

(18) Taw-min'-ítas ta sáq'ulh-a nilh s-ts'aqw-an'-ítas [ti
sell-APPL-3PL.ERG DET half-DET FOC NOM-eat-DIR-3PL.ERG [DET
núkw-a sáq'ulh].
nukw-DET half]
'They sold half of it, and they ate the other half.'
(Matthewson (2005: 65))

However, *nukw* is also possible in cases where the presuppositions of *other* are *not* met. In (19), the meaning of *ta núkwa macaroni* in the last line is not 'the/some other macaroni'; in context it is clear that the DP refers to some of the macaroni that is already being discussed. (In contrast, the *nukw* in the third line *does* mean 'other'.)

(19) T'ak aylh q'wel [ta macaroni-ha].
go then cook [DET macaroni-DET]
'Then the macaroni was getting cooked.'

Nilh s-a-s p'líxwexw.
FOC NOM-IMPF-3POSS boil.over
'Then it overflowed.'

Kwán-lhkan [ta *núkw*-a tsqústen].
take(DIR)-1SG.SUBJ [DET *nukw*-DET saucepan]
'I took another saucepan.'

Pekw-en-lhkán áku7 [ta *núkw*-a macaroni].
pour-DIR-1SG.SUBJ DEIC [DET *nukw*-DET macaroni]
'I poured some of the macaroni into it.' (Matthewson (2005: 219))

Similarly in (20), the *nukw*-phrase is clearly partitive in that it refers to some of the previously mentioned food; it does not refer to some *other* food.

(20) Mítsa7q-kalh aylh, nilh s-wa7-s
sit-1PL.SUBJ then FOC NOM-IMPF-3POSS
nlham'-ci-túmul-em [i s-7ílhen-a].
put.in-APPL-1PL.OBJ-PASS [DET.PL NOM-eat-DET]
'We sat down, then they served us the food.'

Aoy t'u7 [i *núkw*-a] kw-a-s áma s-7ílhen.
NEG just [DET.PL *nukw*-DET] DET-IMPF-3POSS good NOM-eat
'Some of the food wasn't good.' [≠ the other food wasn't good]
(Matthewson (2005: 471))

The third set of uses of *nukw* involve novel discourse contexts; these are illustrated in (21)–(22).

(21) Wa7 tsut [i *núkw*-a úcwalmicw] k-wa-s tu7
IMPF say [DET.PL *nukw*-DET person] DET-IMPF-3POSS then
nilh i cácl'ep-mec-a k'al'em-mín-itas kw s-wa7
FOC DET.PL Fountain-people-DET wait-APPL-3PL.ERG DET NOM-be
i wa7 sáysez'-wit lh-us pipántsek.
DET.PL IMPF play-3PL HYP-(IMPF)3CONJ summer
'Some people say that it was the Fountain people who they waited for, to play [sports] during summer.' [okay as beginning of story]

(22) I-cín'-as, wa7 ku7 láti7 [ti *núkw*-a
when.PAST-long.time-3CONJ be REPORT DEIC [DET *nukw*-DET
míxalh].
bear]
'Once upon a time, there was a bear.'

We have seen so far that *nukw*-phrases are used in (a) familiar 'other' contexts, (b) familiar partitive contexts, and (c) novel existential contexts. I will argue below that what unifies all the data in (15)–(22) is that *nukw* always conveys the notion of 'some but not all' of some larger set.

Support for the 'some but not all' semantics of *nukw* comes from the fact that nouns with unique denotations become impossible when *nukw* is added, as shown in (23b), which is emphatically rejected.

(23) a. Ka-lhéxw-a aylh [ta snéqwem-a].
CIRC-appear-CIRC then [DET sun-DET]
'The sun rose.'

b. *Ka-lhéxw-a aylh [ta *núkw*-a snéqwem].
CIRC-appear-CIRC then [DET *nukw*-DET sun]
'A sun rose.'

A point of clarification about (23): the English translation of (23b) is also bad, although it uses a non-proportional existential determiner. However, the St'át'imcets (23b) and its English translation are degraded for different reasons. The English version is deviant because of the speaker's failure to use the definite article, which would explicitly presuppose the uniqueness of the referent. As argued by Heim (1991), in English the definite article must be used wherever its presuppositions are met. In St'át'imcets, on the other hand, there are no contrasting determiners which encode uniqueness, so that cannot be what is making (23b) bad (cf. also (23a), with the same determiner, which is good). Rather, it is solely the presence of *nukw* in (23b) – and, I argue, its proportionality requirement – which renders the sentence unacceptable.[7]

[7] Thanks to an anonymous reviewer for asking for clarification of this point.

The final piece in the puzzle presented by *nukw* is that, unlike English partitive *some (of)*, *nukw* is entirely licit in existential sentences. This is shown in (24), as well as in (22) above.

(24) a. Wa7 [i *núkw*-a sqweyíts] l-ta lep'cálten-a.
be [DET.PL *nukw*-DET rabbit] in-DET garden-DET
'There are some rabbits in the garden.'

b. Á7hen! wa7 [ta *núkw*-a splaont] l-ta
look be [DET *nukw*-DET skunk] in-DET
lep'calten-lhkálh-a!
garden-1PL.POSS-DET
'Look, there's a skunk in our garden!'

Before proceeding to the analysis, a note is in order regarding my use of the term 'proportional'. Several people have suggested that *nukw* is not truly proportional, in the sense that the English quantifier *most* is, for example. In a sentence of the form *most A B,* the cardinality of the set A ∩ B must be greater than the cardinality of the set A – B (equivalently: greater than half the cardinality of A). That is, there is some lexically specified proportional relation between the size of two sets. This is not true of *nukw*-phrases, which merely require that a phrase of the form *nukw Det NP* not pick out the entire set denoted by the NP.

However, I believe that a simple 'not all' semantics does count as proportional. Observe that a 'not all' requirement can be represented in a way which is almost identical to Partee (1988)'s denotation for the proportional readings of weak quantifiers. Partee's interpretation of a sentence of the form *few A B* under its proportional reading is given in (25).

(25) $\frac{|\, A \cap B \,|}{|\, A \,|} \leq k$ k a fraction or %

We can adapt (25) to represent the 'not all' requirement of a *nukw*-like determiner, as shown in (26).

(26) $\frac{|\, A \cap B \,|}{|\, A \,|} < 1$

Such a determiner would be in one sense even more similar to *most* than weak quantifiers like *many* and *few* are; both (26) and *most* lexically specify the proportion, while, with the proportional readings of *many* and *few,* the value for the variable k is context-dependent.

The proposal that the 'not-all' determiner whose meaning is represented in (26) is proportional is also supported by Partee's claim that one of the tests for

proportional *few* is that the relevant predicate cannot be true of *all* elements of a set. One of Partee's examples is given in (27). (27) contains cardinal *few,* and it 'could be true in a situation where all the faculty children were at the picnic, but there were few faculty children back then.'

(27) There were few faculty children at the 1980 picnic.

Proportional *few,* as found in the subject of an individual-level predicate in (28b), crucially does not allow all members of the set to satisfy the predicate.

(28) a. Few egg-laying mammals turned up in our survey, perhaps because there *are* few.

b. #Few egg-laying mammals suckle their young, perhaps because there *are* few.

Finally, Partee notes that the proportional reading of weak quantifiers is unavailable in unambiguously adjectival positions. If *nukw* were proportional, this would correlate with – perhaps even explain – the fact that *nukw* never appears in adjective position (see (8) above). Having said all this, we will see below that we cannot analyse *nukw* precisely as a generalized-quantifier-forming determiner with the semantics in (26). This is because St'át'imcets DPs do not denote generalized quantifiers but individuals (cf. Matthewson (1999)). This will in turn lead to the result that *nukw* is proportional, in the sense discussed here, but only by presupposition rather than truth-conditionally.

Summarizing what we have established so far about the semantics of *nukw,* we have seen that (i) *nukw* is not itself quantificational (the determiner is responsible for the existential force); (ii) *nukw* unambiguously indicates 'not all' in at least some of its uses; (iii) *nukw* is unspecified with respect to familiarity. Before moving to the analysis, I provide one final refinement of the generalizations, relating to discourse sensitivity. Observe that in (29) the phrase *i núkwa sk'wemk'úk'wmi7t* must denote a proper subpart not merely of the NP denotation but of the five *most salient* children.

(29) *Context: There are 20 children in the daycare. You are in a room with five of those children, and you notice that those five are all hungry.*

#Wa7 tayt [i *núkw*-a sk'wemk'úk'wmi7t].
IMPF hungry [DET.PL *núkw*-DET children]

'Some of the children are hungry.' [Only means: some but not all of the five in the room.]

I therefore conclude that a *nukw*-phrase must denote a proper subset of the set of contextually salient individuals satisfying the NP denotation.

2.4 Analysis of *nukw*

We have seen that *nukw* requires its DP to correspond to a proper subset of the set of contextually salient individuals satisfying the NP. The question now is how *nukw*-phrases are semantically composed. Recall that *nukw* always co-occurs with a determiner. We know from previous work on St'át'imcets that these determiners function like domain restrictors, in the sense that, as choice functions, the determiners narrow the set denoted by NP by picking a (singular or plural) individual from that set (see Matthewson (1999); cf. also Giannakidou (2004)). We might therefore suppose that, first, the determiner restricts the domain so that the DP denotes the contextually salient (singular or plural) individual, and, second, *nukw* further reduces the denotation to a proper subpart of the contextually salient individual. Of course, this order of composition would not accord with the syntax I proposed above, according to which *nukw* combines first with the determiner, rather than with a Det-NP phrase. We will now see that it also would give the wrong semantics.

In (30), *nukw* appears with a singular N. It is clear that the determiner has not first composed with the NP, as suggested in the previous paragraph: *ti núkwa míxalh* does *not* mean 'some but not all of a bear' or 'some but not all of the contextually salient bear'.

(30) I-cín'-as, wa7 ku7 láti7 [ti *núkw*-a
when.PAST-long.time-3CONJ be REPORT DEIC [DET *nukw*-DET
míxalh].
bear]
'Once upon a time, there was a bear.'

Singular examples therefore show that it is *not* that the determiner first restricts the denotation of the DP to the contextually salient group, and then *nukw* enforces a proper subset requirement. We can also confirm this result by comparing the *nukw* example in (30) with the cases in (31), which involve quantifiers which *do* combine with a DP:[8]

(31) a. ?[Tákem [ti míxalh-a]$_{DP}$]$_{QP}$ q'wexq'wíx.
[all [DET bear-DET]] black
'All of the bear is black.'

b. ?[Tqilh t'u7 tákem [ti míxalh-a]$_{DP}$]$_{QP}$ q'wexq'wíx.
[almost just all [DET bear-DET]] black
'Almost all of the bear is black.'

[8] Thanks to Henry Davis for suggesting this comparison.

The fact that *nukw* does not operate to further narrow an already restricted domain is in line with Giannakidou (2004), Etxeberria (this volume), Etxeberria (to appear), arguing that it is in principle impossible for the operation of domain restriction to happen twice.[9]

Having reasoned that *nukw* must compose with the determiner, there are now two options for how to implement the 'not all' requirement: as part of the truth conditions, or as a presupposition.[10] The former option would involve adopting a generalized-quantifier-style analysis and giving *nukw* a denotation of type <<et,e>,<<et>,<et,t>>>. This is illustrated in (32) (where C is the set of contextually salient singular or plural individuals).

(32) $[\![nukw]\!] = \lambda f \in D_{<et,e>} . \lambda g \in D_{<et>} . \lambda h \in D_{<et>} . \exists x [C(x) = g(x) = h(x) = 1 \ \& \ \neg [\forall y [C(y) = g(y) = 1 \rightarrow h(y) = 1]]]$.

This would straightforwardly yield a proportional reading, since it enforces a proportion between the cardinality of C ∩ NP and the cardinality of C ∩ NP ∩ VP. The problem with this approach is that it renders the determiner vacuous, and thereby loses the widest-scope/referential properties of St'át'imcets DPs (cf. section 2.3.1). As outlined in detail in Matthewson (1999), St'át'imcets DPs cannot be treated as generalized quantifiers, since we could not account for their scope properties under such an approach. The same widest-scope peculiarities hold of *nukw*-DPs, as will be shown in section 2.4.1.3 below. I therefore reject the approach in (32), and turn to the other option for implementing the 'not all' requirement: as a presupposition.

The presuppositional approach is given in (33). For any set A, +A is understood to be the individual that is the sum of all the members of A. The underlined portion is the presupposition; *nukw* is of type ≪et,e>,<et,e≫.[11]

(33) $[\![nukw]\!] = \lambda f \in D_{<et,e>} . \lambda g \in D_{<et>}$ and $\underline{f(g) < + (C \cap \{x : g(x) = 1\})}$. $f(g)$

This analysis says that *nukw* takes a determiner as its first argument, and an NP as its second. The presupposition checks what the result of applying the determiner in context to the NP is, and compares this to the sum of C ∩ NP. The presupposition then requires that the former be a proper part of the latter. For example, suppose the NP is *sk'úk'wmi7t* 'child'. The presupposition

[9] In fact, I do not consider *nukw* itself to be performing domain restriction; it is the determiner which provides C; *nukw* merely specifies what relation obtains between C and the denotation of the DP.

[10] For now, I am simply assuming that all uses of *nukw* involve a 'not all' requirement; in section 2.4.1.4 I will discuss the apparently non-proportional cases as in (22) or (24).

[11] I am grateful to Hotze Rullmann for discussion of how to formulate the presupposition of *nukw*.

requires that the child picked out by f is a proper part of the group of salient children. If the NP is *sk'wemk'úk'mi7t* 'children', the presupposition requires that the plurality of children picked out by f is a proper part of the sum of all the salient (singular or plural) children.[12]

If defined, the denotation of the entire *nukw*-phrase is identical to the denotation of the plain DP without *nukw*. Therefore, *nukw* does not affect truth conditions, but merely functions to enforce proportionality. In the remainder of this section I show that the predictions of the analysis in (33) are upheld.

2.4.1 *Predictions of the analysis*

2.4.1.1 *An implicature* The analysis in (33) includes a proportionality presupposition: the denotation of the *nukw*-DP is presupposed to be a proper part of the contextually salient set of individuals satisfying the NP description. In this section we investigate an interesting empirical consequence of the claim that the proportionality requirement is a presupposition (as in (33)) rather than part of the truth conditions (as in the GQ analysis in (32)).

As we have seen, the proportionality presupposition restricts the denotation of the *nukw*-DP; crucially, however, it does not say anything about whether the individuals denoted by the *nukw*-DP are the only NP-satisfying individuals who also satisfy the *VP*. This has the consequence that a sentence like (34) actually only claims that *at least* a proper subset of the contextually salient boys left.

(34) Qwatsáts [i *núkw*-a sqayqéqy'ecw].
leave [DET.PL nukw-DET boys]
'Some of the boys left.'

The *nukw*-phrase in (34) picks out a set of boys, which is presupposed to be a proper subset of the contextually salient boys, and asserts that this group left. However, this semantics does not rule out the *remaining* contextually salient boys also leaving. Thus, although *nukw* provides a proportionality presupposition, we seem to predict no observable proportionality effect in discourse.

However, the denotation in (33) does predict the right results for the St'át'imcets data. Let's work through an example. Suppose there are four contextually salient boys: Benjamin, Merlin, Adam, and Rafael. Suppose that

[12] It is the proper part requirement that differentiates a *nukw*-phrase from an ordinary choice function indefinite; the latter would allow the entire domain set to be returned as the value of the function.

the DP *i núkwa sqayqéqy'ecw* picks out Benjamin and Merlin, so the presupposition is satisfied. Now, suppose that all four of the boys left. (34) is still true, since the individual consisting of Benjamin and Merlin left. However, we can predict that (34) in this context *implicates* that Adam and Rafael did not leave. The reason for the implicature is that, if all four of the boys did leave, the simpler and shorter sentence in (35), which lacks *nukw,* would be true.

(35) Qwatsáts [i sqayqéqy'ecw-a].
leave [DET.PL boys-DET]
'The boys left.'

The fact that the speaker of (34) went to the trouble of using *nukw,* which presupposes non-maximality, strongly suggests that (35) is not true. We further see that (unlike the rejected analysis in (32)), (33) correctly predicts that we can cancel the implicature that not all contextually salient boys satisfy the VP denotation. This is shown in (36).[13]

(36) *Context: You are a teacher and you sometimes take some or all of your students to visit an elder. You are talking to this elder on the phone and you say to her:*

Cúy'-lhkan ts7as-ts [i *núkw*-a
going.to-1SG.SUBJ come-CAUS [DET.PL *nukw*-DET
sk'wemk'úk'wmi7t] áts'x-en-tsi-m.
children] see-DIR-2SG.OBJ-1PL.ERG
'I am going to bring some of the children to see you.'

Ts7ás-ts-kan kelh zam' [tákem i
come-CAUS-1SG.SUBJ FUT after.all [all DET.PL
sk'wemk'úk'wmi7t-a] áts'x-en-tsi-m.
children-DET] see-DIR-2SG.OBJ-1PL.ERG
'In fact, I'll bring all of the children to see you.'

We can summarize these results as follows. The fact that the DP picks out a subset of the contextually salient individuals satisfying the NP is a presupposition. However, the fact that only a subset of the contextually salient individuals satisfying the NP also satisfy the VP is an implicature.

2.4.1.2 *Unique cases correctly predicted to be bad* Recall that sentences containing *nukw* inside a singular DP which is known to have a unique referent are emphatically rejected:

[13] A sequence similar to (36) was rejected by one consultant. This accords with a general reluctance to allow overt cancellations of implicatures in St'át'imcets, and supports the idea that *nukw* does include a proportionality aspect of meaning (since otherwise, there would be no reason for any speaker to reject (34)).

(23) b. *Ka-lhéxw-a aylh [ta *núkw*-a snéqwem].
CIRC-appear-CIRC then [DET *nukw*-DET sun]
'A sun rose.'

The analysis predicts this effect. (23b) presupposes that the DP *ta snéqwema* in context denotes a sun which corresponds to a proper subset of the set of contextually salient suns. This presupposition conflicts with the state of our solar system; hence, the sentence results in laughter on the part of the consultant.

2.4.1.3 *Presupposition projection* I have claimed that the 'not all' aspect of the semantics of *nukw* is a presupposition. This predicts that the 'not all' aspect of meaning should project through negation and other operators, like presuppositions do. This prediction is upheld, as illustrated in (37).

(37) *Context: Talking about meals at residential school.*

Aoy t'u7 i *núkw*-a *pro* k-wa-s áma s-7ílhen.
NEG just DET.PL *nukw*-DET *pro* DET-IMPF-3POSS good NOM-eat
'Some of it wasn't good food.'
= 'For some but not all of it, it wasn't good food.'

(37) presupposes that the denotation of *i núkwa pro* corresponds to a proper subset of all the contextually salient food. It then denies that this proper subset was good food. As outlined above, this will not force the rest of the food to be good; however, it will certainly implicate that the rest of the food was good. Importantly, however, the 'not all' requirement cannot take scope under the negation. Thus, (37) cannot mean something like 'It is not the case that some but not all of it was good food'. If (37) could mean that, we would expect that (37) could be followed in discourse by (38). However, it cannot.

(38) (37) cannot be followed by:

#Tákem i s-7ílhen-a wa7 áma.
all DET.PL NOM-eat-DET IMPF good
'All of the food was good.'

In a sense, it is not at all surprising that the meaning of *nukw* takes wide scope with respect to negation in (37), especially given the non-quantificational status of *nukw*-phrases argued for above. As shown by Matthewson (1999), DPs containing the determiner *i . . . a* necessarily take widest scope in St'át'imcets with respect to any operator. On the other hand, quantified phrases in St'át'imcets can – in fact, must – take narrow scope with respect to negation (unless they are left-dislocated), as shown by Davis

(2005: 19f.). The data in (37)–(38) thus serve once again to support the referential analysis of *nukw*, and to rule out the generalized quantifier analysis of the 'not all' requirement which was rejected above.

2.4.1.4 *Out of the blue uses of* nukw Recall that *nukw* is good discourse-initially. An example was given in (21), repeated here.

(21) Wa7 tsut [i *núkw*-a úcwalmicw] k-wa-s tu7
IMPF say [DET.PL *nukw*-DET person] DET-IMPF-3POSS then
nilh i cácl'ep-mec-a k'al'em-mín-itas kw s-wa7
FOC DET.PL Fountain-people-DET wait-RED-3PL.ERG DET NOM-be
i wa7 sáysez'-wit lh-us pipántsek.
DET.PL IMPF play-3PL HYP-(IMPF)3CONJ summer
'Some people say that it was the Fountain people who they waited for, to play [sports] during summer.' [okay as beginning of story]

Discourse-initial uses of *nukw* are common with plural DPs, and are less common with singular DPs (Henry Davis, Jan van Eijk, p.c.). Consultants often prefer to translate out-of-the-blue singular *nukw*-phrases into English using *other*, which implies that a prior context has been accommodated. Examples of this are given in (39)–(40).

(39) Aoz t'u7 kw-en-s zúqwnucw [ku *nukw* ts'i7]
NEG just DET-1SG.POSS-NOM kill.animal [DET *nukw* deer]
lhkúnsa ku sq'it.
now DET day
'I didn't kill another deer this day.' (volunteered gloss)
Consultant's comment: 'You already killed one and you didn't this day.'

(40) *Context: Out of the blue.*
Wá7 [ta *núkw*-a sqweyíts] l-ta lep'cálten-a.
be [DET *nukw*-DET rabbit] in-DET garden-DET

Speaker 1: 'The other rabbit is in the garden.' (volunteered gloss)

Speaker 2: 'That would be like saying you already saw some by the house and then there's one by the garden.'

However, discourse-initial *nukw* with singular DPs is also sometimes ignored in translation, and is often accepted in elicitation contexts, without any indication of accommodation being required. For example, a third speaker accepted (40) and commented that it is acceptable 'because you're talking about just one'. Similarly, if a singular DP is substituted for the plural *i núkwa úcwalmicw* 'some people' in (21), the result is an acceptable sentence, as shown in (41).

(41) Wa7 tsut [ta *núkw*-a úcwalmicw] k-wa-s tu7 nilh
IMPF say [DET *nukw*-DET person] DET-IMPF-3POSS then FOC
i cácl'ep-mec-a k'al'em-mín-itas kw s-wa7
DET.PL Fountain-people-DET wait-APPL-3PL.ERG DET NOM-be
i wa7 sáysez'-wit lh-us pipántsek.
DET.PL IMPF play-3PL HYP-(IMPF)3CONJ summer
'Someone said that it was the Fountain people who they waited for, to play [sports] during summer.' [okay as beginning of story]

Another example of discourse-initial singular *nukw* is given in (42); cf. also (24b) above.

(42) Íkena7! wá7 [ta *núkw*-a xzum sk'ák'y'et] l-ta
eek be [DET *nukw*-DET big spider] in-DET
sácwemten-a!
bathtub-DET
'Eek! There's a big spider in the bathtub!'
Consultant's comment: 'That sounds ok if you saw one.' Do you have to have seen one before? 'No, because sometimes you see them so it's not presuming.'

How does the analysis presented here account for discourse-initial uses of *nukw*? Recall that although *nukw* is presuppositional, it crucially differs from English *other* in not requiring there to be any previously known alternate individual(s) in $C \cap NP$. To account for discourse-initial uses, we need only assume that, in out-of-the-blue contexts, C can be vacuously large (i.e. contain all individuals in the domain). In that case, the presupposition of *nukw* reduces to requiring that the denotation of the DP correspond to a proper subset of the denotation of the NP.

The claim that C can be vacuously large in discourse-initial contexts obviously has wider-ranging implications which deserve attention in future work. The idea does not seem implausible, however: it seems reasonable to assume that an out-of-the-blue context comes with no contextually narrowed domain.[14]

Note that in its ability to be vacuously large, C differs from the reference of definite descriptions in English. This accounts for the difference between *nukw* and English *some of the* with respect to discourse familiarity, as shown

[14] Anastasia Giannakidou (p.c.) asks whether we could avoid postulating vacuously large C by instead proposing that *nukw* itself is vacuous in the out-of-the-blue cases discussed here. However, it is not clear to me under the latter option how we would differentiate the cases where *nukw* would be vacuous from those where it is clearly not vacuous (i.e. all non-discourse-initial instances).

in (43). *Some of the* NP requires prior mention of a contextually salient set of NPs.

(43) *Context: Out of the blue; no prior knowledge of a set of rabbits.*
#Some of the rabbits are eating your lettuce.

The situation, then, is that, if there is a contextually salient set of individuals, C does some work, and C ∩ NP will already be reduced to a proper subset of the denotation of the NP predicate. *Nukw* will then require the denotation of the DP to be a proper subset of C ∩ NP. If there is no contextually salient set of individuals, the *nukw*-phrase is only required to denote a proper subset of the entire denotation of the NP predicate.

This account also seems to explain the difference in status between singular and plural *nukw*-DPs. The key to the explanation is that plain plural DPs in St'át'imcets can, and in fact prefer to, denote the entire set of individuals satisfying the NP. In fact, the most common way to express generic statements is to use a plain plural DP, as shown in (44).

(44) Sáq'w [i haláw'-a].
fly [DET.PL eagle-DET]
'Eagles fly.'

Since, in the absence of *nukw*, a discourse-initial plural DP could easily denote the entire set of NPs, *nukw* does some work when it appears with a plural DP and a vacuously large C. With singulars, however, the situation is different: by virtue of the singular determiner, the DP already denotes a proper subset of the entire set of NPs (with the exception of singleton predicates such as *snéqwem* 'sun', discussed above). This means that singular *nukw* in an out-of-the-blue context is essentially vacuous, and therefore is predicted to be dispreferred.

2.5 Consequences for existential sentences and familiarity effects

We have seen that the element *nukw* only ever appears inside a DP whose determiner contributes existential quantification to the sentence. We have also seen that DPs containing *nukw* are unambiguously proportional, in the sense of meaning 'some, but not all'. Finally, we have seen that *nukw*-DPs are underspecified with respect to familiarity; they are felicitous in any kind of context, from discourse-initial to familiar. I have argued that *nukw* is presuppositional: it presupposes that the DP denotes a proper subset of the intersection of C with the NP denotation. This in turn means that *nukw* presupposes that the denotation of the NP restriction is non-empty. However, *nukw* does *not* presuppose discourse-familiarity. That is, there need not be any familiar or

salient individuals satisfying the NP restriction. This distinction will be crucial below.

In this section we will examine the theoretical consequences of an existential, proportional, non-familiar element such as *nukw*. The first set of consequences has to do with the correct analysis of the definiteness effect in existential sentences (section 2.5.1). The second set of consequences has to do with the general absence of items which encode a familiarity requirement in St'át'imcets (section 2.5.2).

2.5.1 *Existential sentences*

Nukw provides a good testing-ground for theories about existential sentences, because it splits two properties which are often linked in the denotations of quantifiers: proportionality and presuppositionality (in the sense of familiarity). That is, quantifiers are often assumed to be proportional just in case they quantify over a presupposed (= familiar) set of individuals. We see this in the difference between English unstressed *some (s'm)* on the one hand, and stressed *SOME* or partitive *some of the* on the other. Unstressed *s'm* is neither proportional nor presuppositional, and it is straightforwardly good in existential sentences, as shown in (45a). *Some of the* and *SOME* are not only proportional (in the sense that they mean 'some but not all') but also presuppositional, in that neither is felicitous unless the relevant NP denotation is already in the domain of discourse. Both are degraded in existential sentences, as shown in (45b). For the link between proportionality and presuppositionality, see Herburger (1993), Musan (1995), Diesing (1992), among others.

(45) a. There are *s'm* rabbits in the garden.

b. *There are *some of the* rabbits/*SOME* rabbits in the garden.

The putative link between proportionality and presuppositionality has already been disproved for Dutch (de Hoop (1992), de Hoop (1995)). de Hoop argues that the quantifier *sommige* 'some' always gets a partitive reading, not a cardinal reading (see also, de Jong (1983)); it means 'some, but not all'. She further shows that *sommige* is disallowed in existential sentences:

(46) a. *Er zijn [*sommige* eenhoorns] [in dit bos].
there are [*some* unicorns] [in this forest]
'There are some unicorns in this forest.'
(Dutch; de Hoop (1992: 208))

b. *Er zijn [<u>sommige</u> eenhoorns] wit.
there are [<u>some</u> unicorns] white

*'There are some unicorns white.' (Dutch; de Hoop (1995: 427))

However, the proportionality of *sommige* is not what excludes it from existential sentences, since other explicit and implicit partitives *are* allowed in Dutch *there*-sentences, as shown in (47).[15]

(47) a. Er zijn [*twee van de* drie eenhoorns] wit.
there are [*two of the* three unicorns] white
* 'There are two of the three unicorns white.'
(Dutch; de Hoop (1995: 427))

b. Er zijn [*enkele* eenhoorns] wit, de rest is zwart.
there are [*some* unicorns] white the rest is black
* 'There are some unicorns white, the rest are black.'
(Dutch; de Hoop (1995: 427))

de Hoop's solution is to say that *sommige* is presuppositional, in the sense that it ranges over a group which must be familiar in the discourse, and that this is what is incompatible with the existential context (see also Comorovski (1988)). Other partitives, as in (47), are proportional but not presuppositional.

In a sense, *nukw* makes the flip side of de Hoop's point. While *sommige* is proportional and familiar and is disallowed in existential sentences, *nukw* is proportional and non-familiar, and is good in existential sentences. This might lead us to conclude that the defining criterion for phrases which are excluded from existential sentences involves familiarity.

However, things are not as simple as just outlined. In the remainder of this section I will show that the presuppositionality-based analysis of Zucchi (1995) makes incorrect predictions for *nukw*. I will also argue that the analysis of Keenan (2003) makes incorrect predictions for *nukw*. Finally, I will show that the analysis of McNally (1998) has the best chance of accounting for *nukw*.

Before proceeding, I will clarify the grammaticality status of *nukw*-phrases in existential sentences. One might think that the link between proportional readings and infelicity in existential sentences is already disproven in English. For example, McNally (1997: 10) claims that partitives are generally licit in existential sentences, and gives the following data:

(48) a. This time, there were *none of the objections* they had encountered on other occasions.

[15] Hotze Rullmann (p.c.) informs me that the judgements on Dutch partitives in existential sentences are somewhat controversial (as is also the case for English; see discussion shortly below). He confirms, however, that existential sentences with *sommige* are worse than those with other partitives.

b. There were *many of the same people* at both events.
(McNally (1997: 10))

Hoeksema (1996: 12–14) similarly claims that partitives are good in presentational existential sentences, as in (49a), and bad only in purely existential sentences, as in (49b).

(49) a. There were *several of us* in the room.

b. #There is *one of the two boys.* (Hoeksema (1996: 13))

Just as in Dutch (cf. footnote 15), the acceptability status of English partitives in existential sentences is somewhat controversial. I will set aside the debate about English here, since it is not my goal to give an analysis of English partitives. I will simply note that *nukw* in St'át'imcets appears to be freely and easily available in existential sentences. Thus, I am proposing that *nukw*-phrases in existential sentences have a grammaticality status corresponding to uncontroversially 'weak' phrases in English.[16]

2.5.1.1 *Zucchi (1995)* A brief and simplified summary of the analysis of Zucchi (1995) is as follows. Zucchi argues that DPs which are unacceptable in *there*-sentences are those which contain presuppositional determiners. Zucchi's notion of 'presuppositional' is that the relevant determiners presuppose that the denotation of their NP is not empty. He also assumes that, in an existential sentence, the coda (e.g. 'in the garden') provides the contextual domain for the interpretation of the postverbal NP. In (50), for example, the presupposition of the determiner *every* is that the set of students *in the garden* is non-empty.

(50) *There is every student in the garden.

Finally, there is a felicity condition on *there*-sentences: the common ground must include neither the proposition that the NP+coda is empty, nor that it is non-empty. (48) does presuppose that the set of students in the garden is non-empty, so the sentence is bad. Note that for the felicity condition to give the right results, it is crucial that the coda condition obtains (that is, it is crucial, as just outlined, that the determiner exercises its presupposition on the NP+coda sequence, rather than just on the NP).[17]

Zucchi's analysis is inapplicable to *nukw* for two major reasons: first, the coda condition does not hold for *nukw*; second, *nukw* is presuppositional

[16] For the same reason I am also discounting the possibility that *nukw*-phrases in existential sentences have a similar status to the acceptable uses of definite noun phrases in existential sentences in English (see, for example, Ward & Birner (1995), Abbott (1992), Prince (1992), among many others).

[17] See Giannakidou (1998), Giannakidou (1999), Giannakidou (2006) for arguments that *every* is nonveridical, and thus does not actually presuppose that its domain is non-empty.

under Zucchi's definition, yet is good in existential sentences. With respect to the coda condition, this condition would entail for example that in (24b), repeated here, *nukw* presupposes that the denotation of its plain DP is a proper subset of the contextually salient skunks *in our garden*.

(24) b. Á7hen! wa7 [ta *núkw*-a splaont] l-ta
look be [DET *nukw*-DET skunk] in-DET
lep'calten-lhkálh-a!
garden-1PL.POSS-DET
'Look, there's a skunk in our garden!'

However, (24b) does *not* presuppose that there is more than one skunk in our garden; on the contrary, it is entirely felicitous if there is only one skunk in our garden. This casts doubt on the idea that the coda restricts the domain of evaluation of *nukw* in St'át'imcets existential sentences.[18]

Turning now to Zucchi's core proposal about the semantics of the determiners which are excluded from existential sentences, we see also here that *nukw* is problematic for the analysis. Recall that *nukw* presupposes that the denotation of [Det NP] is a proper subset of the contextually salient set of individuals fitting the NP description. This entails that the set of individuals fitting the NP description is non-empty; *nukw* thus would come out as presuppositional in Zucchi's sense, and therefore would be incorrectly predicted to be ruled out from existential sentences.

2.5.1.2 *Keenan (2003)* Keenan (2003: 200) claims that the DPs which are acceptable in existential sentences are the set of (Boolean compounds of) DPs built from lexical determiners which are conservative on the second argument ($cons_2$). Lexical $cons_2$ determiners are defined in (51). P_E is the set of subsets of E (properties of individuals); $GQ_{E,X}$ is the set of functions from P_E into X. (In the simplest case, X = {true, false} and the result is an ordinary generalized quantifier.)

(51) A map D from P_E into $GQ_{E,X}$ is *conservative on the second argument* ($cons_2$) iff $A \cap B = A' \cap B \Rightarrow DAB = DA'B$, for all $A, A', B \subseteq E$.
(Keenan (2003: 200))

A determiner which is $cons_2$ relies on (a) the value of the second argument, and (b) the value of the second argument intersected with the first argument.

[18] I do not know whether the coda condition for existential sentences is completely absent in St'át'imcets, or merely does not apply to *nukw,* which the reader will recall has a unique syntax in the language. It is possible that a Zucchi-style analysis could successfully rule out strong quantifiers from St'át'imcets existential sentences – see (14d) above – and to do that, one would have to assume that the coda condition obtains (see the discussion in Zucchi (1995: 55)).

We can change the value of the first argument without changing truth, as long as the intersection of the two arguments remains constant. For example, *exactly two* is $cons_2$. If the women who are dancing are the same individuals as the chiefs who are dancing, then the two sentences in (52) necessarily have the same truth value. It doesn't matter if the set of women is not equivalent to the set of chiefs and does not even have the same cardinality as the set of chiefs.

(52) a. Exactly two women are dancing.
b. Exactly two chiefs are dancing.

On the other hand, *all* is not $cons_2$, as shown by the fact that (53a) and (53b) can have different truth values in a situation where the dancing women are exactly the dancing chiefs.

(53) a. All (the) women are dancing.
b. All (the) chiefs are dancing.

Is *nukw* $cons_2$? Imagine the following situation: there are four women at the party, Alfreda, Bernice, Clara, and Darla. Alfreda and Bernice are chiefs, but Clara and Darla are not. There are no other chiefs at the party. Alfreda and Bernice are dancing. The situation is schematized in (54).[19]

(54) A = {a,b,c,d} (women)
A′ = {a,b} (chiefs)
B = {a,b} (dancers)

If *nukw* were $cons_2$, then (55a) and (55b) should necessarily have the same truth value. However, in the situation described, (55a) is felicitous and true but (55b) is rejected by consultants.

(55) a. Wa7 q'wezílc [i *núkw*-a smelhmúlhats].
IMPF dance [DET.PL *nukw*-DET women]
'Some women are dancing.'
b. #Wa7 q'wezílc [i *núkw*-a kúkwpi7].
IMPF dance [DET.PL *nukw*-DET chief]
'Some chiefs are dancing.'

There is no available denotation for the DP *i núkwa kúkwpi7* in (55b) which allows the sentence to be true in this context. Since there are only two salient chiefs, and since the DP is marked as plural, the DP in context can only denote the sum of Alfreda and Bernice. Once it does this, the presupposition of *nukw*

[19] Thanks to Hotze Rullmann for help in constructing the relevant scenario.

cannot be satisfied, since the sum of Alfreda and Bernice is not a proper part of the sum of contextually salient chiefs.

One might object that we should set aside cases where the presuppositions of *nukw* are not satisfied when evaluating whether *nukw* is $cons_2$ (cf. von Fintel's 'Strawson entailment', Fintel (1999)). In that case, we get a slightly different result. Suppose that the situation is exactly as before, except that Clara is also a chief, and she is also dancing:

(56) A = {a,b,c,d} (women)
A′ = {a,b,c} (chiefs)
B = {a,b,c} (dancers)

This time, (55a) is felicitous and true, while (55b) is also technically true, as long as we assume that the plain DP inside (55b) can denote, for example, the sum of Alfreda and Bernice. However, (55b) is still rejected by consultants in this context, due to the strong implicature that there should be some contextually salient chief who is not dancing.

It is at this stage not completely clear to me whether *nukw* counts as $cons_2$. If we adopt the step of considering only sentences whose presuppositions are satisfied before judging *nukw,* then we would presumably have to allow the same escape route for other presuppositional determiners, including English *some of the.* This would then predict that *some of the* is $cons_2$ and should be felicitous in existential sentences. As observed above, the literature is divided on the facts with respect to English partitives, although the majority opinion seems to be that they are degraded.[20]

2.5.1.3 *McNally (1998)* McNally (1998) argues that there is no single generalization which accounts for existential sentences. Instead, there are two separate constraints operative, one with a stronger effect than the other. First, strong quantifiers are (usually) ruled out because the existential predicate requires the postverbal NP to either denote a property (or a 'non-particular'), or a quantifier over properties/non-particulars. This requirement is illustrated in (57). (57a) and (57b) contain the same determiner, but differ in their status because (57a) but not (57b) quantifies over particulars.

(57) a. *There were most books in his library.
b. There were most sorts of books in his library.
(McNally (1998: 358))

Second, definite descriptions are ruled out (less strictly) because of a pragmatic novelty requirement. McNally basically follows Prince (1981), Prince

[20] Giannakidou (2006) also discusses overgeneration problems for the Strawson entailment idea, in the realm of the licensing of polarity items.

(1988), among others, in claiming that the existential predicate pragmatically requires the postverbal NP to introduce a novel discourse referent. A crucial component of McNally's approach is that definite descriptions in English allow property denotations (following Partee (1987)). Definites are not ruled out by the non-particular restriction which rules out strong quantifiers, but only pragmatically by the novelty restriction.

McNally's theory seems to have the best chance so far of accounting for St'át'imcets existential sentences, since the way McNally divides up the facts correlates with the grammaticality status of St'át'imcets existential sentences. First, let's assume strong quantifiers are ruled out in St'át'imcets for the same reason they are in English. Adopting McNally's analysis would of course predict that, if a strong quantifier quantifies over non-particulars as in (57b), the sentence is acceptable. Unfortunately, this prediction is very difficult to test, since St'át'imcets lacks any nouns such as *sort, kind*, or *variety.*[21]

The second component of McNally's analysis is correctly predicted not to apply in St'át'imcets. That is, plain DPs and *nukw*-DPs are all licit in existential sentences because they differ from English definites in lacking a familiarity requirement, and therefore the pragmatic novelty constraint does not rule them out. We therefore see that the independent absence of familiar determiners in St'át'imcets immediately derives the split between strong quantifiers, which are bad, and ordinary DPs, which are all good. This lends support to McNally's division of the set of nominals which are unacceptable in English existential sentences into two separate categories.

There is one aspect of McNally's approach which may not be applicable to St'át'imcets. Recall that her analysis would require us to assume that all St'át'imcets DPs can be type-shifted to denote properties, just as English definites can. However, type-shifting of DPs does not seem to happen in St'át'imcets (unlike in English). For example, there is no independent evidence for Partee's *BE* type-shift (Partee (1987)) in St'át'imcets. On the contrary, there is a strict complementary distribution between the elements which can appear in argument positions (full DPs, containing a determiner) and the elements which can appear in predicate positions (NPs, containing no determiner; see Matthewson (1998), Matthewson (1999) for data). Adopting this aspect of

[21] Just as this article went to press, Henry Davis suggested that the following type of sentence could be used to test McNally's prediction:

(i) Wa7 [tákem ku wen'-wín'acw s-q'a7] l-ti kétsen-a.
be [all DET REDUP-similar NOM-eat] in-DET kitchen-DET
'There are all sorts of food in the kitchen.'

It appears that this prediction may be correct, but elicitation is preliminary at this stage and further investigation is necessary.

McNally's proposal, therefore, would leave us needing to explain why the DPs are unable to undergo the property type-shift when they appear in syntactic predicate position.[22]

2.5.1.4 *Summary* The discussion of existential sentences presented here is very preliminary and brief. Nevertheless, it seems that, out of the three different approaches discussed, McNally's is the one which has the best chance of accounting for existential sentences in St'át'imcets (although the type-shifting issue remains to be clarified). Under a McNally-style approach, all non-strongly-quantified DPs – including *nukw*-DPs – are licit in St'át'imcets existential sentences, because they lack a familiarity requirement. Note that McNally's account does not predict that English partitives pattern exactly like *nukw*. McNally (1998: 10) states that:

> I take partitives to be acceptable [in existential sentences] and assume they differ from non-partitives only in the felicity conditions on the familiarity or anaphoricity of the referents associated with the complement to *of*.

Of course, the complement to English *of* is a definite DP, and thus induces its own familiarity effects. McNally therefore predicts that, while English partitives are not ruled out by the pragmatic novelty restriction of existential sentences, they can still be infelicitous if the familiarity requirement of the embedded *the* is not satisfied. As has been reiterated throughout this chapter, *nukw*-phrases lack any such independent familiarity requirement.[23] This leads us into the final section, which discusses the lack of familiarity effects in the St'át'imc language as a whole.

2.5.2 *The absence of any familiarity effects in St'át'imcets*

The analysis presented in this chapter assigns a presupposition to *nukw,* but it is not a presupposition of familiarity. Indeed, the facts clearly speak against a familiar analysis for *nukw*; as we have seen, *nukw* is licit in out-of-the-blue or novel discourse contexts, as well as in partitives and anaphoric contexts. In this final section I place the non-familiarity of *nukw* in a wider context, by observing that St'át'imcets completely lacks any elements which could enforce partitivity (like English *some of the*) or anaphoricity (like English *other*). In fact, it is my contention that the entire language lacks any familiarity effects.

[22] Giannakidou (2004) has proposed that such type-shifts *do* exist in St'át'imcets. Giannakidou's proposal stems from an effort to find an analysis of St'át'imcets quantified DPs which parallels the standard analysis of English. See Matthewson (to appear) for a reply to Giannakidou's paper.

[23] In a sense, we are back at the spirit of de Hoop's claim that the reason why *sommige* is disallowed in existential sentences relates to its familiarity requirement.

There is a growing body of evidence that there are no elements in St'át'imcets which induce presuppositions about the discourse. There are no definite/familiar determiners (Matthewson (1998)); all determiners in St'át'imcets are felicitous in novel contexts (see for example (11) above). Furthermore, St'át'imcets clefts (unlike English clefts) do not presuppose familiarity, as shown by Davis et al. (2004). Thus, (58) and (59) are both felicitous discourse-initially; note that their English translations using clefts sound odd.[24]

(58) Ni s-pála7-s-a, nilh ti plísmen-a t'iq
DET NOM-one-3POSS-DET FOC DET policeman-DET arrive
áts'x-en-ts-as.
see-DIR-1SG.OBJ-3ERG
'Once it was a policeman who came to see me.'
(Davis et al. (2004: 113))

(59) *Context: I have been looking after three children, Peter, Jill, and Richard. Both Richard and Jill broke a plate. My husband comes home and the first thing I say to him is:*

Nilh s-Richard ti sek'w-en-táli-ha ta lháxts-a.
FOC NOM-Richard DET break-DIR-TOP-DET DET plate-DET
'It was Richard who broke a plate.' (Davis et al. (2004: 114))

Most strikingly, even presupposition triggers such as 'again', 'stop', 'also', or 'more' do not place the same restrictions on the common ground in St'át'imcets as they do in English (Matthewson (2006)). In particular, these typical presupposition triggers never give rise to von Fintel's 'Hey, wait a minute!' response, which is the most fieldwork-friendly way I know of to detect the presence of presuppositions. As illustrated in (60), St'át'imcets consultants do not challenge presupposition failures in context.

(60) *Context: Addressee has no knowledge of anyone planning a trip to Paris.*

A: Nas *t'it* áku7 Paris-a kw s-Haleni
go *also* DEIC Paris-DET DET NOM-Henry
lh-klísmes-as.
HYP-Christmas-3CONJ
'Henry is also going to Paris at Christmas.'

[24] (59) also illustrates the lack of an exhaustivity requirement in St'át'imcets clefts.

B: O áma.
oh good (Matthewson (2006))

These results can be compared with parallel discourses in English, which very frequently do give rise to 'Hey, wait a minute!'-style responses.

I analyse this failure of the 'Hey, wait a minute!' test as evidence that, although the relevant items are presuppositional, they do not force the content of the presupposition to be familiar to all discourse participants at the time of utterance. This is therefore another instance of St'át'imcets lacking any familiarity effects in the sense of requirements being placed on the common ground.

The consequences of my suggestion that an entire language lacks familiarity presuppositions are quite far-reaching. If my claims about St'át'imcets are correct, we may be forced to postulate a pragmatic parameter, according to which presuppositions have a different effect on the common ground in St'át'imcets than they do in English. I must leave further discussion of this idea for future research. I will simply close by observing that the initially puzzling array of behaviours displayed by *nukw* turn out to be perhaps not very surprising at all, if it is right that the language lacks any familiarity effects. *Nukw* looks very much like an element corresponding to English strong *some* or *other* would be expected to look, in a language which cannot enforce familiarity.

3

On *Every* type of quantificational expression in Chinese*

LISA LAI-SHEN CHENG

3.1 Introduction

There are two particular ways of expressing *every* in Chinese, both of which involve *dōu*, an often discussed element in Chinese linguistics, typically glossed as 'all'. The first way is to combine *měi,* typically glossed as 'every', with *dōu*, (see (1a)). Below I gloss *měi* and *dōu* simply as MEI and DOU, in order to be neutral in our discussion. The second way is by using reduplicative classifiers, as illustrated in (1b).[1]

(1) a. Měi (yī)-ge xuéshēng dōu lái-le.
MEI one-CL student DOU come-PERF
'Every student came.'

b. Tāmén ge-ge dōu hěn cōngmíng.
they CL-CL DOU very intelligent
'Every one of them is intelligent.'

The *měi-dōu* co-occurrence as well as the element *dōu* have often been discussed in the literature (see Lee (1986), Liu (1990), Cheng (1995), Huang (1996), J.-W. Lin (1998) among others). As for the reduplication classifiers, there are some recent discussions in Chinese journals (see Yang (2002), Yang (2004)).

I would like to reopen the discussion of *měi* and *dōu*, in view of Giannakidou & Cheng (2006) where *dōu* is treated as a maximality operator.

* I would like to thank Anastasia Giannakidou, Helen de Hoop, Riny Huybregts, Manfred Krifka, and Rint Sybesma for discussions and suggestions. I also thank the audience in the Workshop on DP structure, nominalization, and the role of DP, EACL 4, the 11th Symposium on Contemporary Linguistics, as well as audiences in Utrecht and Nijmegen. I thank Boya Li, Chin-hui Lin, and Guozheng Peng for making time to discuss their judgements with me.

[1] This is not the typical position for a classifier, see section 3.5.

In particular, I will investigate the *měi-dōu* co-occurrence as well as contexts in which *dōu* occurs without contributing a distributive interpretation.

The cases with reduplicative classifiers which express distributive/universal quantification are worth discussing, not only because of the co-occurrence with *dōu* but also because of interesting differences between Mandarin and Cantonese, which are not pointed out earlier in the literature. Mandarin differs from Cantonese in that in Mandarin, reduplicative classifiers cannot be used as typical numeral-classifiers, while Cantonese does not have such a restriction. I argue that the difference between the two languages follows from a difference in the property of the classifiers. Below I will first discuss *dōu*, as well as the co-occurrence between *měi* and *dōu*, before turning to the reduplicative classifiers.

3.2 The other sides of *dōu*

3.2.1 *The non-distributivity of* dōu

J.-W. Lin (1998) argued that *dōu* is the overt realization of the generalized distributive operator proposed in Schwarzschild (1996). This is based on a number of interesting examples and arguments, which I will not address here. The question that I would like to raise here is whether or not *dōu* is always a distributivity operator. Consider first the following sentences:

(2) a. Tāmén dōu yīqǐ lái.
they DOU together come
'All of them came together.'

b. Zhěng-zuò qiáo dōu dǎo-xiàlái-le. (T.-H. Lin (1998))
whole-CL bridge DOU fall-down-ASP
'The whole bridge collapsed.'

As the examples in (2) illustrate, the contribution of *dōu* is not distributive. In (2a), the adverbial *yīqǐ* 'together' ensures that it is not distributive. The interpretation of the sentence is that 'they all came together' and not '*Each of them came together'. Similarly, in (2b), the bridge collapses as a whole, and not that pieces of the bridge collapsed.

The point of these examples is to show that there are some cases in which *dōu* is NOT a distributive operator.[2] In section 3.2.2, I turn to another use of *dōu* (in combination with wh-phrases), and we see also from such cases that *dōu* is not a distributive operator.

[2] Lin, J.-W. (p.c.) suggests that this non-distributive reading can still be explained under his theory by modifying the 'cover'. Whether or not this is the correct direction to pursue depends on whether or not *dōu* is indeed a distributive operator.

3.2.2 *The co-occurrence of* dōu *with* wh-*phrases*

As is well known and also often discussed in the literature, *wh*-phrases in Chinese exhibit quantificational variability. Thus, aside from a typical interrogative reading (3a), a *wh*-phrase such as *shénme* 'what' can also have an indefinite (3b) or a universal reading (3c).

(3) a. Tā mǎi-le shénme. (interrogative)
he buy-PERF what
'What did he buy?'

b. Tā méiyǒu mǎi shénme. (existential)
he not.have buy what
'He didn't buy anything.'

c. Tā shénme dōu méiyǒu mǎi. (universal)
he what DOU not.have buy
'He didn't buy anything at all/whatsoever.'

In Cheng (1995), *dōu* is treated as a universal quantifier providing universal force to *shénme*, which is treated as an indefinite noun phrase (i.e. as a variable). Lin (1996) considers sentences such as (3c) to always involve a (non-overt) *wúlùn* 'no-matter' (see further discussion concerning *wúlùn* in Giannakidou & Cheng (2006)). In Giannakidou & Cheng (2006), the *wh*-phrase plus *dōu* combination is investigated further, in particular, taking into consideration *which*-phrases and the Free Choice reading. It is shown that *which*-phrases differ from bare *wh*-phrases in their non-interrogative distribution. Here, I review some of the arguments (see Giannakidou & Cheng (2006) for more detailed discussions).

3.2.2.1 *Free Choice* wh Bare *wh*-phrases differ from *which*-phrases in Chinese in that their appearance with *dōu* is less restricted. In contrast with (3c), (4a) is ungrammatical. However, under an intensional context, *which*-phrase plus *dōu* is licit (4b).

(4) a. *Tā *nà-běn shū* dōu méiyǒu mǎi.
he which-CL book DOU not.have buy
'He didn't buy any book.'

b. Tā ná-běn shū dōu bu xiǎng mǎi.
he which-CL book DOU not want buy
'He doesn't want to buy any book.'

This is the same under simple negation contexts, and in questions. (5a) contrasts with (5b) in that *nǎ-běn shū* 'which book' in (5a) cannot be interpreted non-interrogatively. As indicated by the translation, (5a) can only be

interpreted as a question. (5b), on the other hand, can be interpreted as a non-interrogative (see more details below). The difference between the two is episodic negation vs. non-episodic negation (5b).

(5) a. Tā méiyǒu mǎi nǎ-běn shū.
he not-have buy which-CL book
'Which book did he not buy?'
Not: 'He didn't buy any book.'

b. Tā bù xiǎng mǎi nǎ-běn shū.
he not want buy which-CL book
'He does not want to buy any book.'

Similarly, *which*-phrases cannot appear in episodic questions (6a), but they can appear in non-episodic questions (6b).[3]

(6) a. *Tā mǎi-le nǎ-běn shū ma?
he buy-PERF which-CL book Y/N
Intended: 'Did he buy any book?'

b. Tā xiǎng mǎi nǎ-běn shū ma?
he want buy which-CL book Y/N
'Does he want to buy any book?'

In other words, *nǎ*-CL phrases in Chinese do not behave like simple polarity items (compare with *any* in the English translation). They cannot appear in episodic questions and negation. They are Free Choice Items (FCIs) that are polarity-restricted in the sense of Giannakidou (2001).

In Giannakidou & Cheng (2006), it is argued that there are two kinds of FCIs, definite and indefinite. Below I go through some of the arguments for the difference between definite and indefinite FCIs in order to shed light on the interpretation of *dōu*.

3.2.2.2 *Definite vs. Indefinite FCIs* To start with, it is clear that FCIs in Greek can be indefinites. This can be seen from a sentence such as (7), where the FCI *opjosdhipote* can be preceded by the indefinite determiner *enas*. The indefinite nature of such FCIs can also be seen from the fact that such FCIs exhibit quantificational variation (i.e. some FCIs seem to be interpretable as exisitential, and some as universal), and some with indeterminate quantificational force, depending on the Q-adverb they combine with (as shown in Giannakidou (2001)).

[3] The sentence is ungrammatical in contrast with (5a) because the yes-no marker *ma* requires a non-*wh*-question, and *nǎ-běn shū* 'which book' here can only be interpreted as an interrogative *wh*-phrase.

(7) Dhen ime enas opjosdhipote ego ja na mou ferese etsi!
not be.1sg a FC-person I for subj me treat.2sg so
(Ime o aderfos su!)
(am the brother yours)
'I am not just anybody to be treated this way. (I am your brother!)'

Aside from nominal FCI of the kind in (7), Giannakidou & Cheng (2006) discussed another kind of FCI, which we can find in free relatives (FRs) in Greek and English (8a,b). The *wh-ever* FRs and the Greek FC-FRs share in common that *wh-ever* and the Greek *opjosdhipote* appear in a free relative (sentential) structure, and that, due to the FR structure, they can be auto-licensed (i.e. not restricted to non-episodic contexts). And further, *wh-ever* in English and *o-wh-FC* (without *-dhipote*) cannot appear as FC-nominals (i.e. without FR structure) as shown in (9a,b).

(8) a. Whoever saw a fly in his soup complained to the manager.

b. [Opjosdhipote idhe miga sti soupa tu]
[wh-ever person saw.3sg fly in-the soup his]
paraponethike sto diefthind
complained.3sg to.the manager

(9) a. *{Whoever/whichever customer} complained to the manager.

b. *Opjos fititis bori na lisi afto to provlima.
'Any student can solve this problem.'

Giannakidou and Cheng show that FCI-nominals differ from FC-FRs in terms of what appears to be an expectation of existence.

(10) a. If any student calls, I am not here.

b. Whichever student calls, I am not here.

The sentence (10a) with *any* is a neutral statement expressing my desire not to talk to anybody, and there is no expectation that somebody will actually call. The one with *whichever student* (10b), on the other hand, seems to favour (but not require) a context where there is indeed an expectation of call; in fact, it can (but doesn't have to) be an instruction to avoid talking to somebody undesirable. This expectation, which seems to not be as strong as a presupposition, makes sense only in the definite analysis of FRs because we tend to exclude the empty set from the plural FR collection we are forming. With an indefinite, there is no such inclination, hence the unmarked use of the FCI indefinite in a neutral context.

It is in this light that Giannakidou & Cheng made a distinction between definite and indefinite FCIs. The definite FCIs appear only in FRs in English and Greek.

Consider now the data in Chinese. I have shown above that *nǎ*-CL NPs are FCIs, and that they can appear with or without *dōu* (the latter case under non-episodic negation (5b) and yes-no question (6)). In some cases, it may be unclear what the contribution of *dōu* is. However, if we look at examples that are parallel to (10a,b), we see an interesting distinction between FCIs with *dōu* and FCIs without *dōu*.

(11) a. Rúguǒ (yǒu) nǎ-ge rén dǎ-diànhuà lái jiù suō
if have which-CL person telephone come, then say
wǒ bù zài.
I not be
'If anyone calls, say that I'm not here.'

b. (Wúlùn) nǎ-ge rén dǎ- diànhuà lái, wǒ **dōu** bù
no-matter which-CL person telephone come I all not
zài.
be
'Whoever calls, I'm not here.'

Though both sentences are grammatical, (11a) cannot be used in situations in which the phone is ringing. It thus seems that *dōu* contributes to the tendency observed for the definite plurals and FRs, namely the tendency to exclude the empty set. In fact, there is no necessary expectation of a call in (11a) while in (11b) there is. In other words, we obtain the same results as we have seen in Greek. (12a,b), with bare *wh*-forms, further illustrate this difference:

(12) a. Tā bù xiǎng qù nǎr.
he not want go where
'He does not want to go anywhere (in particular).'

b. Tā nǎr **dōu** bù xiǎng qù.
he where all not want go
'He does not want to go to any (of the) places.'

In (12a), the bare *wh*-word *nǎr* 'where' appears under negation. This sentence can be used in cases where there isn't anywhere in particular or special that he wants to go to (though he may indeed want to go some place or other). In contrast, (12b) means that there is absolutely no place, of a contextually determined set of places, that he wants to go to. Again, we have the flavour of wanting to exclude the empty set that comes with definite-like expressions.

The same contrast can be shown with (13a), in contrast with (13b):

(13) a. Tā bù xiǎng mǎi nǎ-běn shū.
he not want buy which-CL book
'He doesn't want to buy any book (in particular).'

b. Tā nǎ-běn shū dōu bù xiǎng mǎi.
he which-CL book all not want buy
'He does not want to buy any (of the) books.'

(13a), without *dōu,* can be interpreted as 'he does not want to buy any (kind of) books'; but (13b) can only be interpreted as 'there is no book (from a contextually determined set) that he wants to buy'.[4]

If this characterization of the difference between FCIs with *dōu* and FCIs without *dōu* is correct, it appears that the presence of *dōu* contributes to the definiteness and thus givenness. Chinese FCIs are thus similar to Greek FCIs in that we have both definite and indefinite FCIs. The difference between the two languages is that in Greek there is a difference between FC-nominal (indefinite) and FC-FR (definite), while in Mandarin Chinese both definite and indefinite FCIs have nominal structure, though *dōu* is present only in the former case.

3.2.2.3 Dōu *as an iota/maximality operator* Given that *dōu* contributes definiteness in the cases of FCIs in Chinese, it is natural to consider *dōu* to be on a par with a definite determiner, that is, it is an iota/maximality operator (see Giannakidou & Cheng (2006) for more details concerning the interpretation of *dōu* and Free Choice). If this is on the right track, then it raises the question whether *dōu* is always a maximality operator. Here I first turn back to the data we discussed earlier in relation to J.-W. Lin (1998)'s proposal, and, in section 3.3, I further discuss data that support the hypothesis that *dōu* is a definite determiner.

Recall the sentences in (2a,b), repeated here as (14a,b). The question we raised earlier concerns the contribution of *dōu*, since it does not seem to contribute distributivity.

(14) a. Tāmén dōu yīqǐ lái.
they DOU together come
'All of them came together.'

b. Zhěng-zuò qiáo dōu dǎo-xiàlái-le. (T.-H. Lin (1998))
whole-CL bridge DOU fall-down-ASP
'The whole bridge collapsed.'

[4] The interpretation that we get from the *wh+dōu* is similar to a topic reading in the sense that there appears to be an 'understood' set. This is more apparent in the sentence in (13b) than in (12b) in the sense that there seems to be a given set of books that the speaker is talking about.

If *dōu* is an iota/maximality operator, it entails that *dōu* takes the maximal member of the (given) set. In the case of *tāmén* 'they', the reading of 'all of them' naturally comes from *dōu* taking the maximal member of the plural pronoun set. As for *zhěng-zuò qiáo* 'the whole bridge', what *dōu* does is to emphasize the entirety of the bridge (that is, it creates the maximal sum of all the parts of the bridge). In other words, the presence of *dōu* in these sentences is consistent with the hypothesis that *dōu* is a maximality operator.

3.3 *Měi* ± *dōu*

3.3.1 Měi *with* dōu

The discussion above argues that *dōu* is not necessarily a distributive operator (as J.-W. Lin has claimed). In this section, I discuss the co-occurrence of *měi* and *dōu*. *Měi* plus *dōu* yields an interpretation comparable to *every* in English, an interpretation with distributivity. Considering the discussion we have above concerning FCIs with *dōu*, the fact that the combination of *měi* and *dōu* yields distributivity further supports the claim that *dōu* itself is not a distributive operator.

Consider first some examples illustrating the co-occurrence.

(15) a. *Měi* (yī)-ge xuéshēng *(dōu) lái-le.
MEI one-CL student DOU come-PERF
'Every student came.'

b. *Měi* (yī)-ge xuéshēng *(dōu) kàn-le nèi-běn shū.
MEI one-CL student DOU read-PERF that-CL-shu
'Every student read that book.'

c. *Měi* yī-ge-chúshī (dōu) zuò yī-daò cài.
MEI one-CL chef DOU make one-CL-dish
'Every chef makes a dish.'

As shown in (15a,b), *dōu* is obligatory with a *měi*-NP. (15c), however, illustrates one of the rare cases in which *dōu* can be optional: in such cases, the object noun phrase is an indefinite (an observation due to Huang (1996)). An analysis of treating either *měi* as a distributive operator or *dōu* as a (generalized) distributive operator (as in Lin (1996), J.-W. Lin (1998)) needs an extra mechanism for the obligatoriness of *dōu* in (15a,b) (see below).

Under the null hypothesis that the *dōu* that appears in FCIs and the *dōu* that appears with *měi* is the same element, we need to consider the possibility that *dōu* also contributes maximality in the *měi-dōu* co-occurrence. To see whether *dōu* also contributes maximality in the *měi-dōu* co-occurrence, we need to first understand the interpretation that *měi* contributes.

J.-W. Lin (1998) argues that *měi* is not inherently distributive.[5] Consider the interaction between *měi-yī-zǔ xiǎohái* 'every group of children' and *dōu* in (16) (example adapted from J.-W. Lin (1998), ex. (61b&a)):

(16) a. Měi yī zǔ xiǎohái dōu huà-le yī-zhāng huà.
MEI one group child DOU draw-PERF one-CL picture
'Every group of children drew one picture.'

b. Nèi-yī-zǔ xiǎohái dōu huà-le yī-zhāng huà.
that-one-group child DOU draw-PERF one-CL picture
'That group of children all drew a picture'.

As Lin points out, in (16b) the distribution is down to the individual child, while in (16a) this is not the case. Instead, in (16a), the distribution is over groups of children, and never to the individual child. Thus, he proposes that NPs with *měi* denote a plurality and that '*měi* denotes a function [which] takes a predicate of type <e, t> as its argument and returns the maximal collection of the individuals denoted by the predicate' (p. 238). In other words, in Lin's view, *měi*-one-CL-NP is comparable to a definite NP (i.e., with maximality). I think that Lin's intuition is basically correct. However, what he attributes to *měi*, I think, is actually what *měi* plus *dōu* contributes. In other words, the maximality is not given by *měi*; rather it is a result of having *dōu* (as we have already seen that *dōu* is a maximality operator with definite FCIs).

How about the plurality of *měi*-one-CL-NP? This then comes back to the question of what the contribution of *měi* is. I suggest that it simply provides a universal force (thus, it counts as a strong quantifier). To see that *měi* does not contribute distributivity by itself, we need to look at cases in which *měi* appears without *dōu*.

3.3.2 Měi *without* dōu

Consider first the data in (17a,b) (from Lü (1980)), in which *měi* is not used inside a noun phrase, but rather heads a conditional clause:

(17) a. Měi yǎn-chū sān tiān, xīu-xí yī tiān.
MEI perform three day rest one day
'Whenever/if (s)he performs for three days, (s)he rests for one day.'

b. Měi féng chūn-jié wǒmén dōu qìng-zhù.
mei get.to spring-festival we dou celebrate
'Whenever/if we have Spring Festival, we celebrate.'

[5] Recall that for J.-W. Lin, *dōu* is the distributive operator.

From the interpretation of the sentences in (17a,b), it is clear that *měi* provides a universal force (that is, it is a conditional universal quantifier).[6] In (17a,b), *měi* binds a situation/case variable (see Lewis (1975)), leading to the appropriate interpretation. We thus have, for (17a) for instance, the following interpretation: for every situation in which he performs for three days, he then rests for one day.

As we have already seen, there are other cases (with *měi* occuring in a noun phrase) in which *měi* does not occur with *dōu*, though the distributive reading is maintained. Consider examples in which *dōu* is optional, as in (18a,b):

(18) a. Měi yī-ge chúshī (dōu) zuò yī-daò cài.
MEI one-CL chef DOU make one-CL dish
'Every chef makes a dish.'

b. Měi yī-ge rén (dōu) xiě yī-fèn-bàogào.
MEI one-CL person DOU write one-CL-report
'Everyone writes one report.'

It should be noted that native speakers tend to consider the variant without *dōu* incomplete (and should be preceded by statements such as 'Our restaurant has a policy'). Further, as noted by Huang (1996), if the object NP is definite, the optionality disappears:

(19) a. Měi yī-ge chúshī *(dōu) zuò nèi-daò cài.
MEI one-CL chef DOU make that-CL dish
'Every chef makes that dish.'

b. Měi yī-ge rén *(dōu) xiě nèi-fèn bàogào.
MEI one-CL person DOU write that-CL report
'Everyone writes that report.'

The reading in (19b) is more felicitous if one thinks about the report as a report that one has to write for a particular course (in other words, getting an indefinite reading for the demonstrative). These data show that the distributive reading is not from *měi*, but rather from the indefinite object. This can be illustrated further in the examples in (20):

(20) a. Yī-ge-chóshī zuò yī-daò cài.
one-CL chef make one-CL-dish
'One dish per chef/Every chef makes a dish.'

[6] Huang (2005) also treats *měi* on a par with *every* in English, though she particularly adopted a skolemized definition of EVERY. See her work for how she handles the *měi-dōu* co-occurrence.

b. Yī-ge-rén xiě yī-fèn-bàogào.
one-CL-person write one-CL-report
'One report per person/Everyone writes one report.'

Since *měi* is not even present in these examples, the distributivity has to come from somewhere else (and note that *dōu* is also not present); instead, it is the presence of two indefinite noun phrases (the numeral can change from *yī* 'one' to other numerals).

The distributivity that we see in cases without *dōu* is probably a case of 'pseudo-distributivity' (cf. Beghelli (1997)). Pseudo-distributivity involves a covert distributive operator comparable to *each* in English, assuming the ingredients of distributivity à la Choe (1987), with a distributive key and a distributive share. In Chinese, when the distributive share is active (occupied by an indefinite NP), it can induce a covert distributive operator.

It should be noted that when an event is bounded, as in cases with perfective (21a,b), the cases with *měi* without *dōu* become a little degraded. Native speakers prefer to add to the beginning of the sentence elements such as *zhèr* 'here'. The question arises as to why elements such as *zhèr* can save sentences with *měi* without *dōu*. By adding elements such as *zhèr* 'here', the domain of *měi* 'every' is restricted (i.e. the universal quantifier in (21a) quantifies over the chefs who are here). This can be treated on a par with the sentences in (18a,b), in which native speakers naturally introduce a restriction to the *měi*-noun phrase. It further strengthens the idea that *dōu* is a maximality operator. With *měi* introducing sets of individuals, *dōu* operates on these sets and closes the domain. Without *dōu*, the *měi* sentences seem odd.

(21) a. ??Měi yī-ge chúshī zuò-le yī-daò cài.
MEI one-CL chef make-PERF one-CL-dish
'Every chef made a dish.'

b. Zhèr měi yī-ge chóshī zuò-le yī-daò cài.
here MEI one-CL chef make-PERF one-CL dish
'Every chef here made a dish.'

We have seen above that *dōu* appears to restrict the quantificational domain of *měi*. We now turn to a more detailed discussion of this function of *dōu*.

3.4 Domain restriction

In section 2, we have seen that *dōu* functions as a definite determiner, providing contextual domain restriction and giveness, in cases with *wh*-FCIs in Chinese (see examples in (12) and (13)). We saw above that in the

co-occurrence of *měi, dōu* is restricting the domain of quantification. This domain restriction function can be further illustrated by the classical paradigm of indefinite subjects:

(22) a. *Sān-ge xuéshēng lái-le.
three-CL student come-PERF

b. Yǒu sān-ge xuéshēng lái-le.
have three-CL student come-PERF
'Three students came.'

c. Sān-ge xuéshēng dōu lái-le.
three-CL student DOU come-PERF
'The three students all came.' (must be a specific set of students.)

A simple indefinite subject is typically considered to be degraded.[7] To save the sentence, one can add the verb *yǒu* 'to have', making an existential sentence, as in (22b), or *dōu* can be added (22c). Note that if *dōu* is a distributive operator, it is unclear why it can save the indefinite (leaving aside the question of whether there is any distributive reading in the sentence). In fact, (22c) is interpreted as a specific noun phrase; it is clear which three students we are talking about. In other words, *dōu* in (22c) introduces familiarity; it provides the contextual domain restriction.

Recent work on the 'explicit' strategy of domain restriction centres upon the role that definite determiners play in providing domain restriction (Giannakidou (2004), Etxeberria (2005)) (see also Fintel (1998), Stanley (2002), who are proponents of the view that domain restriction is done in the grammar, rather than in pragmatics). Below I review some of the discussions in Giannakidou (2004) and Etxeberria (2005).

3.4.1 *Nominal vs. determiner restriction*

From quantification expressions in different languages, two issues of contexual domain restrictions are particularly important. One is the question of whether the restriction is done overtly or covertly. The other is whether or not the restriction is on the nominal or on the quantificational determiner. Consider first overt vs. covert restriction. English is a typical example of covert contextual domain restriction (though of course an overt domain can be spelled out as well). Thus, in a sentence such as (23a), *every* does not have an overt restriction, while the domain is clearly restricted to 'my syntax class' in (23b).

[7] The level of acceptability varies, though in some cases it rests upon the reading. If the interpretation is three of the students (a more specific reading), emphasizing the numeral, the sentence is acceptable.

(23) a. Every student passed the exam.
b. In my syntax class, every student passed the exam.
c. ∀x [student$_c$] passed the exam.

For quantification expressions such as *every student*, the standard assumption (see, among others, Stanley (2002)) is that the nominal argument of *every*, in this case *student*, has a domain variable C (see (23c)) (yielding nominal domain restriction, see also Stanley & Szabó (2000)), which will refer to a contextually salient property. The nominal argument of *every* is thus a contextually salient set of students (i.e. the students in my syntax class).

Giannakidou (2004), Etxeberria (2005), Etxeberria (this volume) and Martí (2003), Martí (this volume) argue that the domain restriction can be composed with the quantificational determiner (i.e. the domain restriction is not restricted to the nominal argument). Their arguments concern strong quantifiers accompanied by a definite determiner. Consider the data in (24a,b).

(24) a. The Greek determiner 'each' = 'the + every' (Giannakidou (2004))

o	kathe
the$_{masc.sg}$	every
i	kathe
the$_{fem.sg}$	every
to	kathe
the$_{neut.sg}$	every

b. Basque (Etxeberria (2005))

[Ikasle	guzti-*(ak)]	berandu	etorri	ziren.
student	all-D.pl(abs)	late	come	aux.past.pl

'All of the students came late.'

As we can see in Greek and Basque, the definite determiner cannot be omitted with strong quantifiers. Giannakidou and Exteberria argue that since the definite determiner is at the outer layer of the determiner expression (i.e. the strong quantifier is first composed with the nominal argument), the contextual domain restriction provided by the definite determiner is composed with the strong quantifier, thus deviating from the idea that the domain variable is part of the nominal argument.

Giannakidou (2004) argues that we also see domain restriction on quantificational determiners in Lillooet Salish (see also discussion concerning this

issue in Etxeberria (this volume)): in (25), the determiner *i…a* restricts the quantificational determiner *zí7zeg*' 'each'.[8]

(25) Lillooet Salish (Matthewson (2001))

i zí7zeg'-a sk'wemk'úk'wm'it
det.pl each-det child.pl
'each child'

In short, in Greek, Lillooet Salish and Basque, we not only see overt contextual domain restriction provided by a (definite) determiner (see footnote 8), we also see that the restriction can be directly composed with the quantificational determiner.

3.4.2 *Domain restriction with* dōu

We have seen that, in the case of *měi* as well as in the case of indefinites with numerals, *dōu* seems to provide domain restriction. In the *měi* case, speakers want to specify some kind of location to restrict the domain (recall the earlier discussion of adding *zhèr* 'here'), or *dōu* has to appear. In the indefinite numeral case, the presence of *dōu* makes the indefinite specific (i.e. the domain is specified; see Martí (this volume) for discussions concerning domain restriction with existential quantifiers).

Consider now more data in Mandarin Chinese. (26a) is comparable to the examples above in English (23a), except for the fact that, in (26a), the phrase *zhè-ge bān* 'this class' is obligatory. It is thus revealing that, when *dōu* is present, this phrase is no longer obligatory. In other words, *dōu* plays the same role as the phrase *zhè-ge bān* 'this class' in (26a).

(26) a. Wǒ jiāo-guò *(*zhè-ge bān*) suǒyǒu de xuéshēng.
I teach-EXP this-CL class all DE student
'I have taught all the students in this class.'

b. Wǒ suǒyǒu de xuéshēng *dōu* jiāo-guò.
I all DE student DOU teach-EXP
'I have taught all the students (in some domain).'

[8] Though Lillooet Salish seems similar to Greek and Basque in the use of a determiner in restricting the quantificational domain of the quantificational determiners, the determiner *i…a* in Lillooet Salish is not a definite determiner (in contrast with Greek and Basque) (Matthewson (1999), Matthewson (2001)). Further, this determiner can also be first combined with the nominal, as in (i):

(i) zi7zeg' i sk'wemk'úk'wm'it-a (Matthewson (2001))
each D.pl child(pl)-D
'each of the children'

J.-W. Lin (1998), in developing an account for *měi-dōu* co-occurrence, pointed out that, besides *měi*, there are other quantifiers that also require the presence of *dōu*. Examples (27a–c) are from J.-W. Lin (1998).

(27) a. Měi-ge xuéshēng *(dōu) mǎi-le shū.
every-CL student DOU buy-PERF book
'Every student bought a book.'

b. Dàbùfèn de xuéshēng *(dōu) mǎi-le shū.
most DE student DOU buy-PERF book
'Most students bought a book.

c. Suǒyǒu de xuéshēng *(dōu) mǎi-le shū.
all DE student DOU buy-PERF book
'All the people bought a book.'

(27a–c) show that Mandarin Chinese is on a par with Greek and Basque in that strong quantifiers also need to have overt contextual domain restriction.[9] The element that can do this job in Mandarin Chinese is *dōu*, which has been analysed in Giannakidou & Cheng (2006) as an iota/maximality operator. We have seen that, in Greek and Basque, it is the definite determiner which provides the domain restriction. The fact that *dōu* also provides domain restriction gives us further supporting evidence that *dōu* is an iota operator; it is a definite determiner.

In contrast, weak quantifiers do not need to have *dōu*. But they may appear with *dōu*, as the examples below show. When they do, they are interpreted as domain-specific, almost as definites, as indicated in the translation.

(28) a. Hěnduō xuéshēng (dōu) mǎi-le shū.
many student DOU buy-PERF book
'Many students bought books.'

b. (Yǒu) sān-ge xuéshēng mǎi-le shū.
have three-CL student buy-PERF book
'Three students bought books.'

c. Sān-ge xuéshēng dōu mǎi-le shū.
three-CL student DOU buy-PERF book
'The three students bought books.'

As (28a–c) show, with weak quantifiers such as *hěnduō* 'many', and numerals, it is possible to have *dōu*, but its presence is not obligatory. This is similar to Basque and Greek as well.

[9] The Mandarin Chinese patterns the same as Basque in that strong quantifiers are required to be contextually restricted. See also Etxeberria (this volume).

3.4.2.1 *DP-external restriction* We noted above that languages differ as to whether it is the nominal that is being directly restricted by the domain restrictor (for example, as in the standard assumption or in Lillooet Salish (see footnote 8)) or it is the quantification determiner which is directly restricted, as in the case of Greek and Basque. To answer the question of which element is being restricted in Mandarin Chinese is actually not an easy task. The reason is that although *dōu* is on a par with definite determiners in Greek and Basque in terms of providing contextual domain restriction, and *dōu* can be considered to be a definite determiner qua its semantic contribution, it does not seem to appear in a determiner position inside the noun phrase; let alone the fact that Chinese is generally considered to be a language without any determiner.

Consider first data from Basque, which Etxeberria (2005) provides to show that the contextual domain restriction in Basque is DP-internal.

(29) *[[Ikasle gehien] eta [irakasle guzti]-ak] goiz iritsi
student most and teacher all-D.PL(abs) early arrive
ziren.
aux.PL.past
'Most of the students and all the teachers arrived early.' (intended)

(29) shows that a single determiner in Basque cannot license a conjoined noun phrase. This is due to the fact that the definite determiner is directly restricting the strong quantifier. It is thus not possible for one definite determiner to license two strong quantifiers.

The example in (30), however, shows that Mandarin Chinese differs from Basque in that one *dōu* can license a conjoined noun phrase.

(30) Dàbùfèn de xuéshēng hé měi-ge lǎoshī dōu zǎo dào.
most DE student and MEI-CL teacher DOU early arrive
'Most of the students and all the teachers arrived early.'

This shows that *dōu* in Mandarin Chinese is not attached directly to the strong quantifier, which we can also see overtly. Note that if *dōu* is directly attached to a noun (phrase), and the strong quantifier is merged subsequently to the noun phrase, the grammaticality of (30) would also not be expected. What we have here is more compatible with the traditional view that *dōu* is adjoined to the VP, that is, *dōu*, if it is a determiner, is DP-external. Being DP-external allows it to contextually restrict a conjoined DP.

This view is also compatible with the traditional view that Chinese has no determiner – the traditional view is equating determiners with DP-internal determiners.

The role of *dōu* as a contextual domain restrictor fits well with the discussion we had earlier concerning the semantic interpretation/contribution of *měi*. Since *dōu* appears to be required for contextual domain restriction for strong quantifiers, and under the analysis that *měi* is a universal quantifier, the co-occurrence between *měi* and *dōu* is thus expected.

Before we turn to reduplicative classifiers, a few words should be said about *dōu*'s determiner status, since it appears to be external to DP (as is also confirmed by data like (30)). The idea of a determiner external to DP is not new, as this has also been explored by Hallman (2000), Johnson (2000), and Sportiche (2001) (see also Gil & Tsoulas (this volume)). Though developing a complete analysis of the syntax of *dōu* is beyond the scope of this chapter, I would like to point out that the syntactic position of *dōu*, as well as the answer to the question of why noun phrases that are 'connected' to *dōu* have to move to a certain proximity of *dōu*, have not been satisfactorily given. Positing *dōu* as an external determiner may in fact provide us with a new look at an old problem in terms of the syntax of *dōu*.

3.5 Reduplicative classifiers

We have seen from example (1b) at the beginning of this chapter that there is another way to express *every* in Chinese, by using classifier reduplication.[10] In this section, I show that (a) reduplication yields an interpretation comparable to *měi* and the presence of *dōu* is again obligatory; (b) Mandarin Chinese does not allow numeral-classifiers to reduplicate,[11] while Cantonese Chinese does; (c) the difference between Mandarin and Chinese can follow from the nature of classifiers in these two languages.

Consider first a pair of examples in Mandarin Chinese, which illustrate that prenominal classifiers seem to resist reduplication.

[10] There are also examples with noun reduplication such as (ia). However, not all nouns can do this (see ib).

(i) a. rén-rén dōu hěn nǔ-lì
person-person DOU very hard.working
'Everyone works very hard.'

b. *shū-shū dōu hěn zhòng
book-book DOU very heavy
'Every book is very heavy.'

[11] I call the typical classifiers in Chinese 'numeral-classifiers', to distinguish them from the classifiers which are not related to the numeral, e.g. the ones used as adverbs.

(31) a. *?*Ge-ge* xuéshēng dōu xiě-le bàogào.
CL-CL student DOU write-PERF report
'Every student wrote a report.'

b. Xuéshēng *ge-ge* dōu hen yònggòng.
student CL-CL DOU very work.hard
'Students all work very hard.'

Note that Chinese does not have post-nominal classifers (that is, Chinese differs from languages like Japanese in not allowing numeral-classifier float, cf. Miyagawa (1989)). The reduplicative classifiers in Mandarin are adverbials, comparable to the reduplicated *tiān* 'day' in (32).

(32) Tāmén tiān-tiān (dōu) chī miàn-bāo.
they day-day DOU eat bread
'They eat bread every day.'

Here, *tiān-tiān* 'every day' is interpreted adverbially, and it is certainly not a classifier of *tāmén* 'they' (aside from the fact that pronouns do not occur with classifiers, it is also the wrong 'classifier' for 'people').

Reduplication as a strategy to yield a universal/distributive reading is certainly more widespread cross-linguistically, as shown by the examples in Kannada and Tamil in (33a,b) (data from Jayaseelan (2005), where CONJ = conjunctive marker).

(33) a. Ond(u)-ondu magu-nuu tanna taayi-anna
one-one child-CONJ self's mother-ACC
nooD-i-tu. (Kannada)
see-PAST-3n.sg
'Every child saw its mother.'

b. Ovv-oru kuzhandai-(y)um tan ammaa-vai
one-one child-CONJ self mother-ACC
paarta-adu. (Tamil)
saw-3n.sg
'Every child saw its mother.'

As we see in (33a,b), the numeral 'one' in the respective languages can be reduplicated, and together with the nominal plus a conjunctive marker, we have an expression equivalent to *every*. In Kannada and Tamil, when the reduplicative strategy is used, the typical operator (which Jayaseelan called *disjunctive marker*) used in combination with the conjunctive operator to form *every* is absent. In other words, the reduplicative numerals in Kannada and Tamil appear to do the same job as the typical universal operator.

We also find reduplicative numerals in less exotic languages such as Greek (Giannakidou, p.c.):

(34) Ena ena ta pedia xeretisan tin mitera tous.
one one the children greeted.3pl their mothers.
'The children greeted their mothers one by one.'

3.5.1 *Difference between Mandarin and Cantonese*

We have seen in (31a) that, in Mandarin Chinese, numeral-classifiers cannot be reduplicated (see (35a,b) also). On the other hand, if the classifiers appear as adverbials, then they must be reduplicated. Consider now more examples, which show that even adverbial classifiers are restricted in appearance.

(35) a. *Ge-ge rén dōu yǒu zìjǐ de líxiǎng.
CL-CL person DOU have self DE ideal
'Everyone has his own ideal.'
(data from Yang (2004))

b. *Ge-ge chúshī dōu zuò yī-dào cài.
CL-CL chef DOU make one-CL dish
'Every chef makes a dish./One chef per dish.'

(36) a. Háizimén ge-ge dōu hěn gāoxìng.
children CL-CL DOU very happy
'The children are all very happy.'

b. *Háizimén ge-ge dōu chīfàn-le.
children CL-CL DOU eat-PERF
'The children have all eaten.'

c. *Háizimén ge-ge dōu chī-le yī-wǎn fàn.
children CL-CL DOU eat-PERF one-CL rice
'The children have all eaten a bowl of rice.'
(data from Yang (2004))

(35b) shows that, even in cases where there is an indefinite noun phrase in the object position, it is not possible to have reduplicated classifiers. The contrast between (36a) and (36b,c) shows that adverbial reduplicated classifiers do not always yield legitimate results. Crucially, non-eventive predicates seem to allow reduplicated classifiers while eventive ones do not.

Yang (2004) and Yang (2002) both accounted for this restriction by stating that classifier reduplication yields 'general property' interpretation. Since general property interpretation is not compatible with events, sentences such

as (36b,c) are ruled out. This, however, cannot be the whole story, as we find reduplicative classifiers in Cantonese which are compatible with eventive predicates, as we see below.

As we see in (37a,b), Cantonese allows numeral-classifiers to reduplicate, and they have a reading equivalent to *every* (with an obligatory presence of *dōu*). Further, it should be noted that the reduplicated classifier in this case appears with an eventive predicate in (37b).

(37) a. Go-go jan^{4} dou^{1} jau^{5} zi^{6}gei^{2} ge^{3} lei^{5}soeng^{2}. (Cantonese)[12]
CL-CL person DOU have self GE ideal
'Everyone has his own ideal.'

b. Go-go cyu^{2} dou^{1} zou^{6}-zo yat^{1}-dip^{6} sung^{3}.
CL-CL chef DOU make-PERF one- CL dish
'Every chef makes a dish.'

This picture does not change even if we are using adverbial classifiers; that is, when we have adverbial reduplicated classifiers, they can also be used with eventive predicates (compare the grammatical (38b) with the ungrammatical (36c)):

(38) a. Di^{1} sai^{3}lou^{6} go-go dou^{1} hou^{2} hoi^{1}sam^{1}. (Cantonese)
CL$_{pl}$ child CL-CL DOU very happy
'The children are all very happy.'

b. Di^{1} sai^{3}lou^{6} go-go dou^{1} sik^{6}-zo yat^{1}-wun^{2} fan^{6}.
CL$_{pl}$ child CL-CL DOU each-PERF one- CL^{bowl} rice
'The children have each eaten a bowl of rice.'

Descriptively, what we can see from the difference between Mandarin and Cantonese is that reduplicative classifiers in Mandarin are not the same as *měi*, since there is no co-occurrence restriction of *měi* and eventive predicates. On the other hand, Cantonese classifier reduplication is similar to *měi*. It has the same function as a universal quantifier. In other words, we can say that reduplication of classifiers in Cantonese yields a set of individuals.

3.5.2 *Count-marker vs. classifier*

To understand the source of the difference between Mandarin and Cantonese, it is necessary to understand how classifiers in Mandarin differ from classifiers in Cantonese. In Cheng & Sybesma (1999), it is noted that ClassifierP (i.e. Classifier Phrase) in Mandarin must be selected by the numeral head. They stipulated this because Mandarin differs from Cantonese in that Cantonese

[12] The numbers after each morpheme in the Cantonese examples indicate tone.

allows classifier-noun sequence without any pre-classifier numeral or demonstrative, and that this sequence can denote definiteness, while Mandarin classifier-noun sequence cannot yield such an interpretation, as shown by the contrast between (39a) and (39b).

(39) a. *Běn shū hěn zhòng. (Mandarin)
CL book very heavy
'The book is very heavy.'

b. Bun^{2} syu^{1} hou^{2} cong^{5}. (Cantonese)
CL book very heavy
'The book is very heavy.'

Sybesma (2007) notes that (a) the distribution of [Cl(assifier)-N] phrases in Cantonese is largely the same as that of bare nouns in Mandarin, which can also denote definiteness; (b) the use of the general classifier (*ge*) is more widespread in Mandarin than in Cantonese (*go*); and (c) the nominal suffix *-zi*, originally a dimunitive suffix, is very common in Mandarin count nouns, while it is virtually absent in Cantonese. Consider, for instance, the following pair:

(40) a. yǐ-zi 'chair'(椅子) c. chē-zi 'car' (Mandarin)
b. yi^{2} 'chair' d. ce^{1} 'car' (Cantonese)

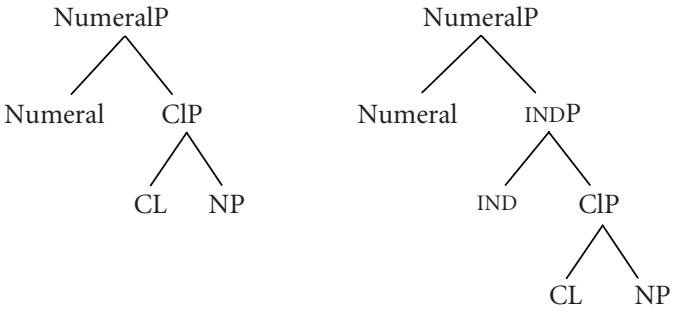
There are many many more pairs which illustrate this (see also Pirani (2007)). In Cheng & Sybesma (1999), classifiers are said to have the function of individuation. Sybesma (2007), taking into consideration the differences in count nouns between Mandarin and Cantonese, proposed that *-zi* in Mandarin marks the noun as count. That is, *-zi* has the function of individuation (cf. Borer (2005a)). Classifiers on the other hand are used to combine numerals with the nouns (cf. Doetjes (1997)). Cantonese, moreover, does not have a separate element which functions as an individualizer. As a consequence, the Cantonese classifier acts as both an individuator and a go-between of the numeral and noun.

Note that under this view, *-zi* suffixation (marking a noun as count/individuating) is a lexical process. This means that count nouns in Mandarin come out from the lexicon as individuated. In contrast, individuation in Cantonese is a syntactic process, since count nouns are not already marked as such in the lexicon. In both languages, classifiers are used to combine nouns with numerals.

In the spirit of Sybesma (2007), I propose that, aside from the CL(assifier) projection, there is also an IND(ividuation) projection. Cantonese classifiers

start out as individuators and move to CL. Mandarin, on the other hand, simply does not have IND, since classifiers are not individuators. The structures are presented in (41a,b).

(41) a. Mandarin b. Cantonese



Getting back to reduplicative 'classifiers' and the differences between Mandarin and Cantonese, if we take into consideration how the classifiers differ in these two languages, then in Cantonese, what we are reduplicating is an individuator. Thus, the reduplication can yield (sets of) individuals. On the other hand, in Mandarin, classifiers in the nominal domain simply cannot be reduplicated.

What is interesting is that, once these classifiers are used adverbially, they can be reduplicated. However, in Mandarin, it is the case that the reduplicated classifiers are still restricted in their interpretation and co-occurrence with predicates. Here, I can only speculate that, when classifiers in Mandarin are reduplicated outside of the nominal domain, they get a collective/group interpretation, and are thus compatible with predicates that denote group properties. This of course does not explain why these classifiers cannot be reduplicated in the nominal domain and yield the collective/group interpretation.

3.6 Conclusion

I have provided additional evidence above that *dōu* is comparable to (definite) determiners in other languages (such as Greek, Basque, and Lillooet Salish), in that it provides contextual domain restriction, and it is obligatorily present with strong quantifiers. This entails that Chinese actually has a definite determiner. However, this determiner is not in the nominal domain, but rather a determiner which is generated outside of the noun phrase. Such an external determiner has actually been proposed by Sportiche (2001) and Johnson

(2000) for English. If this analysis is on the right track, it implies that, even for languages which do not seem to have a determiner inside the noun phrase, there are elements in the sentence which take the determiner function.

The claim that *dōu* is an external determiner, providing contextual domain restriction, fares well with the interpretation of *měi* as well as the obligatory co-occurrence between *měi* and *dōu*. This way, we do not have to re-invent an interpretation of *měi* which must then be compatible with a distributive *dōu*.

Lastly, I have also shown that a reduplicative classifier in Cantonese is similar to *měi* in that it yields the same results as a universal quantifier, resulting in individuals. The co-occurrence between reduplicative classifiers and *dōu* is simply the same as typical strong quantifiers. The difference between Cantonese and Mandarin, I have argued, stems from a difference in the nature of the classifiers in these two languages. Although we need to further examine the use of reduplicative classifiers as adverbials, it is clear that Cantonese classifiers are individuators, which, when reduplicated, yield sets of individuals.

4

Contextually restricted quantification in Basque[1]

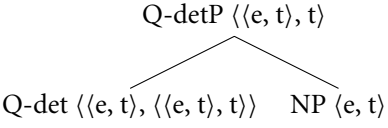
URTZI ETXEBERRIA

4.1 Introduction

Under the standard analysis of quantification, quantificational determiners (Q-det) of type ⟨⟨e, t⟩, ⟨⟨e, t⟩, t⟩⟩ combine with a Noun Phrase (NP) term (of predicative type ⟨e, t⟩) to create a generalized quantifier (GQ) of type ⟨⟨e, t⟩, t⟩ as in (1) (see Montague (1973), Barwise & Cooper (1981), Keenan & Stavi (1986)).

(1) a. $[_{\text{Q-detP}}$ every student]

b.



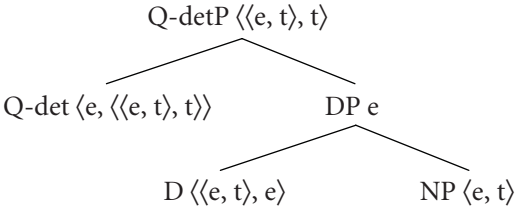
Despite the wide acceptance this analysis has had in the formal semantic tradition, there are languages that seem to lack the standard construction exemplified in (1). Matthewson (2001), based on her analysis on St'át'imcets (a Lillooet Salish language) quantifiers, proposes that quantification in natural language must proceed in two steps, rather than in one: first, the D combines

[1] I would like to thank Ricardo Etxepare, Fernando Garcia Murga, Anastasia Giannakidou, Brenda Laca, Utpal Lahiri, Luisa Martí, Lisa Matthewson, Louise McNally, Javier Ormazabal, Myriam Uribe-Etxebarria, Aritz Irurtzun, Maia Duguine as well as the organizers and participants of the conference *QP Structure, Nominalization & the Role of DP* (Universität des Saarlandes in Saarbrücken) for comments and discussion. Thanks also to two anonymous reviewers for useful comments. Finally, thanks to Anastasia Giannakidou and Monika Rathert for their patience and guidance. All remaining errors are my own, of course. This research has benefited from the University of the Basque Country project 9/UPV 00114.130-16009/2004, from the project FR2559 from the *Fédération Typologie et Universaux Linguistiques* at CNRS, as well as from a one-year (2005–2006) postdoctoral research grant by the Basque Government.

with the NP predicate to create an entity-denoting element of type *e*, and, in a second step, the created object is taken as an argument by the Q-det (of type ⟨e, ⟨⟨e, t⟩, t⟩⟩ in this case) to yield a GQ of the desired type ⟨⟨e, t⟩, t⟩. In opposition to what the standard analysis of quantification defends, note that in (2b) the complement of the Q-det is an element of type *e* (rather than ⟨e, t⟩).

(2) a. [$_{\text{Q-detP}}$ tákem i smelhmúlhats-a]
[All D.pl woman(pl)-D]
'All (of the) women'

b.



However, in a recent paper, Giannakidou (2004) demonstrates that Matthewson's central predictions face some serious problems and argues that (i) the Q-det internal determiner (D) is a nominal domain restrictor, and (ii) languages differ with respect to whether they overtly or covertly restrict their quantificational domain (see also Etxeberria (2004)). As a consequence, she concludes that the standard analysis of GQs (where quantifiers combine with elements of predicative type) can perfectly explain quantificational facts cross-linguistically (pace Matthewson (2001)).

This chapter proposes a novel compositional analysis of Basque strong quantifiers supporting a theoretical analysis along the lines of Giannakidou (2004). With that aim, Basque quantificational data is offered, which provides clear evidence for the need of both Q-det (Westerståhl (1985a), Fintel (1994), Martí (2003)) as well as nominal domain restriction (Stanley (2002), Stanley & Szabó (2000), cf. also Matthewson (2001)). This variation depends on whether the quantifiers are lexically strong (section 4.4.2.1) or partitives (i.e. strongly interpreted weak quantifiers) (section 4.4.2.2) respectively. Crucially in Basque, the D domain restrictor only appears with strong quantifiers, but it is excluded from weak quantifiers. This is evidence in favour of the fact that these elements are neither quantifiers nor contextually restricted (cf. Milsark (1979), Partee (1988), Cooper (1996), Fintel (1998)), but cardinality predicates.[2]

[2] For ease of exposition and following standard terminology, these elements are referred to as *weak quantifiers* throughout the chapter.

The chapter also presents the compositional behaviour of Basque weak quantifiers, which are proposed to be base-generated at the predicative type (section 4.4.3).

The chapter is organized as follows. In section 4.2, some unwanted consequences of the alternative analysis of generalized quantifiers will be presented. Section 4.3 explains the actual debate on contextual variables and presents Giannakidou's proposal where contextual variables are defended to be able to appear with the nominal or the quantifier. Section 4.4 presents Basque data and proposes and defends a novel analysis for both Basque strong and weak NPs which supports the standard analysis of generalized quantifiers.

4.2 Problems for the alternative analysis of quantification

Matthewson (2001)'s central predictions cannot be extended cross-linguistically (cf. Giannakidou (2004), Etxeberria (2005), Adams (2005), Martí (this volume) for an extended presentation of these problematic facts). I am summarizing the main problematic aspects of the analysis below:

4.2.1 *Q-dets do not take DP arguments*

One of the predictions of Matthewson's proposal (in (2b)) is that Q-dets should be able to combine with definites cross-linguistically. However, the prediction is not borne out.[3]

English:

(3) a. * every the boy
b. * most the boys
c. * many the boys
d. * three the boys
e. all the boys
f. only the boys

Catalan:

(4) a. * cada els nois
lit.: 'each the boys'
b. * la majoria els nois
lit.: 'most the boys'
c. * molts els nois
lit.: 'many the boys'
d. * tres els nois
lit.: 'three the boys'
e. tots els nois
'all the boys'
f. només els nois
'only the boys'

[3] Although I only give English, Catalan, and Greek examples, the same behaviour is shown by many other languages such as Dutch or Spanish.

Greek:

(5) a. * kathe to aghori
lit.: 'every the boy'

b. * merika ta aghoria
lit.: 'several the boys'

c. * tria ta aghoria
lit.: 'three the boys'

d. ola ta aghoria
'all the boys'

e. mono ta aghoria
'only the boys'

Note that the grammatical examples in (3)–(5), which fit in the configuration in (2b), are formed exclusively with *all* and *only*, elements that have been argued not to be quantifiers. *All* +DP has been defended to be a DP modifier with the semantics of an exhaustivity operator (Brisson (1998), Brisson (2003)), and *only* has been argued to be a propositional operator (e.g. Fintel (1997)). Observe that many of the ungrammatical constructions in the examples above become automatically grammatical as soon as the partitive *of* is introduced (e.g. *most of the boys*, *many of the boys*, *three of the boys*).

4.2.2 *Partitive 'of' has semantic import*

If Q-dets combine directly with entity-denoting elements of type *e*, *of* in partitive constructions such as *many of the girls* must be argued to be semantically vacuous (pace Ladusaw (1982), where *of* ensures that the Q-det receives an ⟨e, t⟩ type element as input), so that the cross-linguistic structure of quantification parallels St'át'imcets structure.

According to Matthewson (2001) the presence of the partitive preposition *of* in constructions such as (6) is only due to case reasons.

(6) a. Many of the politicians did not tell the truth.

b. Some of the policemen dedicated the whole day to fine drivers.

However, this assumption is cross-linguistically problematic: to begin with, contrary to what Matthewson predicts, *of* is optional in some constructions, and this should not be so if *of* was there only for case reasons.

(7) a. all (of) the boys

b. half (of) the boys

c. both (of) the boys

Zulu (cf. Adams (2005)) also provides evidence for the fact that it is undesirable to maintain that *of* is there just for case reasons.[4] In the following grammatical sentences the counterpart of *of* is optional and its presence/absence

[4] Thanks to Nikki Adams for bringing the Zulu data to my attention.

has semantic import. In case the only role of the partitive preposition *of* is to assign case to the NP, what case would it be assigning in (8b) that need not be assigned in (8a)? Note that we're playing with the same quantifier and the same NP in both examples.

(8) a. Aba-fana aba-ningi ba-ya-dla.
cl2-boy cl2-many cl2-pres-eat
'Many boys are eating.'

b. Aba-ningi **b**-aba-fana ba-ya-dla.
cl2-many cl2part-cl2-boy cl2-pres-eat
'Many of the boys are eating.'

Furthermore, according to Matthewson (2001), the fact that St'át'imcets (a language that lacks the partitive *of* element – cf. section 4.3.1) lacks overt case marking supports the claim that *of* (e.g. in English, Spanish, etc.) is there only for case reason. Zulu, just like St'át'imcets, lacks overt case marking but, pace Matthewson's assumption, still has a partitive as shown in (8b). In other words, if partitive *of* were just inserted for case reasons, we would not expect to see it in a language where case is not marked overtly.

4.2.3 *Q-det and D can vary their positions*

Matthewson's analysis predicts that DPs are complements to Q-dets: [Q-det [DP]]. However, languages show evidence for both [Q-det [DP]] and [D [Q-det]] constructions showing that not always is an *e* type DP complement to the Q-det.

Although the majority of the St'át'imcets quantifiers combine with a DP argument (9a-b), Matthewson also presents some data that does not fit her own quantificational structure; see (10a–b) – both with strong quantifiers.[5]

(9) a. tákem i smelhmúlhats-a [Q-det [DP]]
all D.pl woman(pl)-D
'all the women'

b. zi7zeg' i sk'wemk'úk'wm'it-a [Q-det [DP]]
each D.pl child(pl)-D
'each of the children'

(10) a. i tákem-a smúlhats [D [Q-det]]
D.pl all-D woman (Matthewson (2001: fn.5))
'all the women'

[5] The St'át'imcets definite determiner consists of two discontinuous parts, a proclitic (*ti* for singulars, *i* for plurals), which encodes deictic and number information, and an enclitic *…a* which attaches to the first lexical element in the phrase. See Matthewson (1999) for details.

b. i zí7zeg'-a sk'wemk'úk'wm'it [D [Q-det]]
D.pl each-D child(pl) (Matthewson (1999: (41c)))
'each child'

Examples where the Q-det appears under D can also be found in Greek, as exemplified in (11b) (cf. Giannakidou (2004)).

(11) a. oli i fitites [Q-det [DP]]
all D.pl students
'all the students'

b. o kathe fititis [D [Q-det]]
D.sg each student (Giannakidou (2004: (32b)))
'each student'

Basque (a head-final language) also provides evidence for the existence of these two structures. Lexically strong Q-dets (see section 4.4.2.1.), and not their nominal arguments, are composed directly with the D (pace Matthewson (2001)).

(12) a. mutil guzti-ak [[Q-det] D] (=[D [Q-det]])
boy all-D.pl
lit.: 'boy all the(pl)'

b. mutil bakoitz-a [[Q-det] D] (=[D [Q-det]])
boy each-D.sg
lit.: 'boy each the(sg)'

Observing all these problematic facts, what I'm going to be proposing in this chapter (following Giannakidou (2004) and providing extra evidence for her analysis) is that the Q-detP internal D acts as a contextual domain restrictor (see also Etxeberria (2004)) and that the domain restrictor can also appear on Q-dets, as shown by the examples (10), (11b) or (12). In cases where the D combines with the Q-det (such as Basque strong quantifiers), the Q-det and the D are argued to compose together creating a new complex quantifier that is contextually restricted (cf. section 4.4.2.1). If this proposal is correct, the standard analysis of GQs can be argued to perfectly explain quantificational facts across languages (pace Matthewson (2001)).

Before exposing our proposal in detail, the next section (4.3) presents one of the core assumptions of this chapter: contextual variables have a syntactic realization.

4.3 On where the contextual domain restriction applies

Contextual variables (realized as $_C$ in 13) receive a value from the context and play a major role in natural language quantification. In fact, there is a general assumption that all quantifiers have a (hidden) domain argument (at LF) whose value is contextually supplied.[6]

Let us observe a situation like the one in (13):

(13) [Speaker A is relating to speaker B the experiences of last night, when A and some of her students went out for a pizza]
A: Everybody$_C$ had a great time (Fintel (1994: 28))

In (13), the speaker A does not intend to convey the idea that everybody, literally, had a great time; instead, a sentence like (13) says something about a contextually restricted set of individuals, those who went out for a pizza last night with A.

One other general assumption is that quantificational domain restriction is always encoded syntactically (the 'explicit strategy' of contextual restriction (Neale (1990)). However, there is a theoretical debate as to where exactly the contextual variable applies. According to some authors, the covert domain variable is placed in the nominal expression (Stanley (2002), Stanley & Szabó (2000), cf. also Matthewson (2001)), while some others defend that the covert domain variable is part of the Q-det (Fintel (1994), Martí (2003)).

In this chapter, I will argue (in line with Giannakidou (2004)) that both nominal and Q-det restriction must be allowed in order to explain quantificational facts cross-linguistically (see section 4.4 for Basque data in favour of this argument). Furthermore, cross-linguistic data show that the default is to implement the contextual variable (implicitly or explicitly) on the nominal; restriction on the Q-det, on the other hand, will only be assumed if there is evidence for it (e.g. the use of a definite determiner).

4.3.1 *Domain restriction placed on the nominal expression*

In opposition to Matthewson's proposal, Giannakidou (2004) takes the data from St'át'imcets (and of those languages that directly embed a DP under a Q-det) to suggest that, in order for a quantifier to combine with a nominal argument, this must be first contextually restricted.[7] The basic assumption

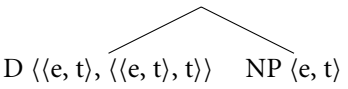
[6] There are other possible analyses that try to explain quantificational domain restriction (see among others Kratzer (2004), Carlson & Storto (2006); see also Cappelen & Lepore (2002), Cappelen & Lepore (2005)).

[7] Cf. Matthewson (2005) where it is argued that the reanalysis of St'át'imcets data offered by Giannakidou does not account for the facts since Giannakidou (2004)'s analysis predicts that DPs

made by Giannakidou is that definite description can undergo predicative shift (Partee (1987)).

Thus, in St'át'imcets restriction will be fulfilled overtly in the nominal via D, which will embody saliency and supply the contextual variable $_C$ yielding a generalized quantifier with a contextually specified set as its generator set.

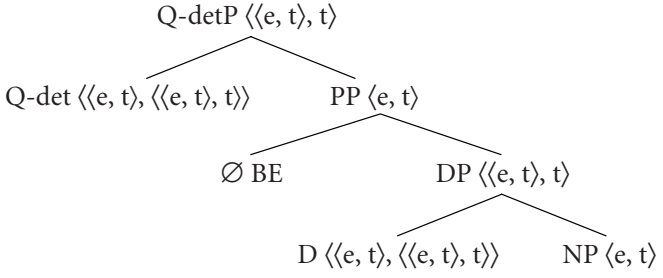
(14)



Once we get the combination in (14), Partee (1987)'s type-shifting operator BE shifts the GQ of type ⟨⟨e, t⟩, t⟩ to an element of predicative type ⟨e, t⟩ for the Q-det to be able to combine with it. Assuming that type-shifters are syntactic elements, in St'át'imcets, the BE type-shifter will be covert and its function will be that of a partitive (see (15)). This analysis allows us to keep the standard GQ theory while accounting for St'át'imcets facts: Quantifier Phrases will be partitives in this language.

(15) a. [tákem i Ø smelhmúlhats-a]
[all D.pl (of) woman(pl)-D]
'all of the women'

b.



Additional evidence in favour of this analysis comes from the fact that there are no overt partitive forms in St'át'imcets (see Matthewson (2001)). In languages with overt partitive *of* forms the covert shift (realized covertly by BE in St'át'imcets) will be blocked since overt type-shifters block covert shifts (Chierchia (1998b)).[8] This correctly predicts that in languages with overt

in St'át'imcets are definite, and, according to Matthewson, they are not. Cf. Giannakidou (2004) and Matthewson (2005) for discussion.

[8] Matthewson (2005) argues against the possibility of having the covert type-shifter BE in St'át'imcets because according to her there is no language-internal evidence for it, and claiming that BE exists in the language makes incorrect predictions, that is, that main predicates could have Ds on them, which they cannot. However, claiming that BE doesn't apply in St'át'imcets would be a strange gap in the language. The type-shifting approach (including the modifications by Chierchia in terms of

partitives direct embedding of DP under Q-det will not be possible and that quantificational domain restriction will be taken care of by overt partitive constructions. This assumption is going to be crucial for the proposal that is going to be put forward in this chapter.

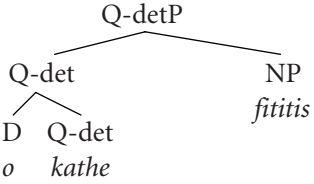
4.3.2 *Domain restriction placed on the Q-det*

Apart from the possibility of restricting the nominal, as is the case in St'át'imcets (where restriction happens overtly) or in languages such as English, Spanish, Greek, or Basque (where restriction happens overtly on the nominal by means of the partitive construction), there are also cases where restriction must be postulated to appear in the Q-det itself, favouring the proposal by Fintel (1994) or Martí (2003) (Stanley (2002), Stanley & Szabó (2000)). This is exactly what appears to be happening with Greek *o kathe* or with St'át'imcets *i zí7zeg'-a*. See section 4.4.2.1. for Basque.

(16) a. o kathe fititis [D [Q-det]] (=11b)
D.sg each student
'each student'

b. $[_{\text{Q-detP}} o_{\text{D}} + kathe_{\text{Q-DET}} [_{\text{NP}} fititis_{\text{N}}]]$

c. o kathe fititis = [kathe (C)] (fititis) 'each student'

d.


As expressed in (16), the D attaches to the Q-det to form a new complex Q-det that contains the variable $_{\text{C}}$ and is contextually restricted. Note that when domain restriction happens in the Q-det, no further definite is allowed, proving that restriction is already accomplished and that the construction in (17) would yield a type mismatch.[9]

(17) * o kathe o fititis
D.sg each D.sg student
lit.: 'the each the student'

covert versus overt type-shifters) would allow BE and block it only if there is an overt element doing what BE does. The question to answer then is: do we have evidence that perhaps D, or something else, does this in St'át'imcets?

[9] Section 4.4.2.1 shows that the reason why contextual restriction cannot happen more than once is due to redundancy.

As we've seen, there are two alternative analyses that try to account for the compositionality of quantification in natural languages: the standard analysis of generalized quantifiers (following Giannakidou (2004)'s innovation) and the alternative analysis as expressed by Matthewson (2001). In what follows I retake this debate from the point of view of Basque quantification; I will first analyse the properties of Basque quantifiers and then I will show that these properties provide clear evidence for the necessity of the contextual domain restrictor appearing on the nominal and on the Q-det (but not on both at the same time). Thus, the Basque quantificational system supports a theoretical analysis along the lines of the recent proposal by Giannakidou.

4.4 The classification of Basque quantifiers and the theory of quantification in natural languages

4.4.1 *The classification of Basque quantifiers*

I will start by focusing on three crucial properties of (Basque) quantifiers: (i) the possibility of co-occurrence with the definite determiner, (ii) the possibility to appear in existential sentences, and (iii) the possibility of being presuppositional.[10]

4.4.1.1 *Not all Basque quantifiers co-occur with the definite determiner* One crucial difference between Basque nominal quantificational expressions is that some of them must necessarily appear with the definite determiner *-a/-ak* as we can see in the examples (18) and (19).[11]

(18) a. [Ikasle **guzti-ak**] berandu etorri ziren.
[student all-D.pl.abs] late come aux.pl
'All (of) the students came late.'

b. * [Ikasle **guzti**] berandu etorri ziren.

(19) a. [Ikasle **bakoitz-ak**] goxoki bat jan zuen.
[student each-D.sg.abs] candy one eat aux.sg
'Each student ate a candy.'

b. * [Ikasle **bakoitz**] goxoki bat jan zuen.

Some other Basque quantifiers, on the other hand, do not appear with the definite determiner no matter whether the determiner is placed in the nominal or in the quantifier.

[10] See Etxeberria (2002b), Etxeberria (2004), Etxeberria (2005) for an extended analysis of these properties.

[11] The reader is referred to Etxeberria (2005), Etxeberria (2008) for more details on the behaviour of Basque definite determiner in simple (non quantificational) DPs.

(20) a. [**Zenbait** politikari] berandu iritsi ziren.
[some politician] late arrive aux.pl
'Some politicians arrived late.'

b. * [**Zenbait**(-**ak**) politikari(-**ak**)] berandu iritsi ziren.

(21) a. [Politikari **asko**] berandu iritsi ziren.
[politician many] late arrive aux.pl
'Many politicians arrived late.'

b. * [Politikari(-**ak**) **asko**(-**ak**)] berandu iritsi ziren.

4.4.1.2 *Existential sentences* Those quantifiers that must necessarily appear with the definite determiner are not accepted in existential sentences as exemplified in (22a); and as opposed to the sentences in (22b).

(22) a. * Badira koadro **guzti-ak/bakoitz-a** erakusketa honetan.
yes-be.pl painting all-D.pl/each-D.sg exhibition this-in
'* There are all of the paintings/each painting at this exhibition.'

b. Badira koadro **batzuk/asko** erakusketa honetan.
yes-be.pl painting some/many exhibition this-in
'There are some/many paintings at this exhibition.'

4.4.1.3 *Presuppositionality* Those quantifiers that appear with the definite determiner are presuppositional in that they presuppose the set denoted by the NP to be a non-empty salient domain. These quantifiers are also veridical since veridicality also relies on a presupposition that the domain be non-empty (cf. Giannakidou (1999)). In fact, in the sentences in (23), the set of *akats* 'mistake' (or *ikasle* 'student' in (23b)) is presupposed to be a non-empty domain.

(23) a. Akats **guzti-ak** aurkitzen badituzu, sari bat emango
mistake all-D.pl.abs find if-aux reward one give
dizut.
aux
'If you find all of the mistakes, I'll give you a reward.'

b. Ikasle **bakoitz-ak** liburu bat irakurtzen badu, sari bat
student each-D.erg book a read if-aux reward one
emango diot.[12]
give aux
'If each student reads a book, I'll give (each student) a reward.'

[12] Due to its inherent distributive properties, *bakoitz* is grammatical only in those situations where there is an element (a distributee which cannot be the event variable) deeper in the structure over which to distribute (see Etxeberria (2002a), Etxeberria (2008)).

In opposition to what happens with those quantifiers that appear with the definite determiner, the ones that do not take *-a*/*-ak* do not presuppose that the set denoted by the NP (*akats* 'mistake') is a non-empty domain.

(24) a. Akats **asko** aurkitzen badituzu, sari bat emango dizut.
mistake many find if-aux reward one give aux
'If you find many mistakes, I'll give you a reward.'

b. Akats **batzuk** aurkitzen badituzu, sari bat emango dizut.
mistake some find if-aux reward one give aux
'If you find some mistakes, I'll give you a candy.'

Note that, in fact, continuations that would question the non-emptiness of the domain are fine with *asko* 'many', *batzuk* 'some', etc. as shown in (24′) while they result in contradiction with those quantifiers that can appear with the definite determiner as the example in (23′) clearly shows.

(23′) Akats **guzti-ak** aurkitzen badituzu, sari bat emango dizut. # Baina gerta liteke bat-ere akats-ik ez egotea.
mistake all-D.pl.abs find if-aux reward one give aux but happen aux one-too mistake-part no be-nom
'If you find all of the mistakes, I'll give you a reward. # But there may be no mistakes at all.'

(24′) Akats **asko** aurkitzen badituzu, sari bat emango dizut. Baina gerta liteke bat-ere akats-ik ez egotea.
mistake many find if-aux reward one give aux but happen aux one-too mistake-part no be-nom
'If you find many mistakes, I'll give you a reward. But there may be no mistakes at all.'

Thus, observing these properties, Basque quantifiers can be classified as follows (cf. Etxeberria (2002b), Etxeberria (2005)):

(25) a. Strong quantifiers: *guzti* 'all', *den* 'all', *gehien* 'most', *bakoitz* 'each'.[13]

[13] There is an element that Basque linguistics literature has analysed as a universal quantifier: *oro* 'all' (cf. Euskaltzaindia (1993), Artiagoitia (2003)). See Etxeberria (2005), Etxeberria (2008) for a different analysis, where *oro* is treated as ambiguous between a real quantificational interpretation and a reading where it functions as a DP exhaustive modifier (à la Brisson (1998), Brisson (2003)). This element will not be treated in this chapter.

b. Weak quantifiers: *batzuk* 'some', *zenbait* 'some', *hainbat* 'some',[14] *asko* 'many', *gutxi* 'few', *ugari* 'abundant', numerals, *numeral N baino gehiago* 'more than numeral N', *numeral N baino gutxiago* 'less than numeral N', etc.

Following a cross-linguistic pattern, the Basque quantifiers that have been described and classified as weak in (25) can also obtain a proportional reading. In such a case they must appear with both the D and the overt version of the partitive *-tik* 'of'.

(26) a. [Ikasle-eta-tik **gutxi**] berandu iritsi ziren.
[student-D.pl-abl few] late arrive aux.pl
'Few of the students arrived late.'

b. [Ikasle-eta-tik **asko**] berandu iritsi ziren.
[student-D.pl-abl many] late arrive aux.pl
'Many of the students arrived late.'

c. [Ikasle-eta-tik **batzuk**] berandu iritsi ziren.
[student-D.pl-abl some] late arrive aux.pl
'Some of the students arrived late.'

These partitive quantifiers are necessarily proportional and the partitive *ikasleetatik* (lit.: 'student the.pl of') in (26) denotes the set of contextually relevant *students* (cf. Ladusaw (1982)). Furthermore, note that these partitive constructions show the same behaviour as lexically strong quantifiers when it comes to existential sentences, where they cause ungrammaticality.

(27) a. * Badira zientzilari-**eta-tik zenbait** laborategi honetan.
yes-be.pl scientist-D.pl-abl some laboratory this-in
'* There are some of the scientists at this laboratory.'

b. * Badira zientzilari-**eta-tik asko** laborategi honetan.
yes-be.pl scientist-D.pl-abl many laboratory this-in
'* There are many of the scientists at this laboratory.'

[14] *Batzuk*, *zenbait*, and *hainbat* are translated as 'some'. However, there is a subtle distinction between the three. While *batzuk* can be used when we refer to a set of just two members, the other two seem to make reference to a bigger plurality (*batzuk* can also be used to make reference to a plurality of more than two members; so its meaning would be 'a contextually given number equal to or bigger than two').

(i) Lagun batzuk etorri dira, Mikel eta Jon hain zuzen ere.
friend some come aux Mikel and Jon so correctly too
'Some friends have come, precisely Mikel and Jon.'

(ii) *?Zenbait/Hainbat lagun etorri dira, Mikel eta Jon hain zuzen ere.
some/some friend come aux Mikel and Jon so correctly too
'Some friends have come, precisely Mikel and Jon.'

They also behave as strong quantifiers when it comes to being presuppositional, since they presuppose the set denoted by the NP they appear with to be a non-empty domain as the examples in (28) show.

(28) a. Akats-**eta-tik** **zenbait** aurkitzen badituzu, 5 euro irabaziko
mistake-D.pl-abl some find if-aux euro win
dituzu.
aux
'If you find some of the mistakes, you'll win 5 euros.'

b. Akats-**eta-tik** **asko** aurkitzen badituzu, 5 euro irabaziko
mistake-D.pl-abl many find if-aux euro win
dituzu.
aux
'If you find many of the mistakes, you'll win 5 euros.'

As was the case with strong quantifiers (cf. examples (23–23′)), continuations that would question the non-emptiness of the domain denoted by the NP result in contradiction with partitives.

(28′) Akats-**eta-tik** **zenbait** aurkitzen badituzu, 5 euro irabaziko
mistake-D.pl-abl some find if-aux euro win
dituzu. # Baina gerta liteke bat-ere akats-ik ez egotea.
aux but happen aux one-too mistake-part no be-nom
'If you find some of the mistakes, you'll win 5 euros. # But there may be no mistakes at all."

Now that Basque nominal quantificational expressions have been classified, the next section concentrates on observing how the Basque nominal quantificational system contributes to the general theory of quantification.

4.4.2 *The theory of quantification considering Basque data*

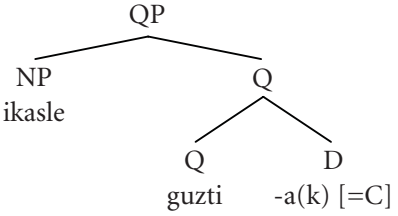
I take the Basque quantificational data presented in the previous section to provide clear evidence for the necessity of both Q-det domain restriction and nominal domain restriction. These data support the conclusions that (i) the Q-detP internal D is a domain restrictor,[15, 16] (ii) Q-det domain restriction and nominal domain restriction (by means of partitive constructions) are needed to explain cross-linguistic quantification, and (iii) the standard analysis of GQ can correctly explain quantificational facts cross-linguistically.

[15] The idea of considering the Basque definite determiner a contextual domain restrictor can be related to the fact that there exists evidence that Basque *-a* is historically derived from the distal demonstrative *hura* (cf. Azkarate & Altuna (2001); cf. also Manterola (2006)), and demonstratives are very much contextually linked elements. See Etxeberria (2005) for an extended analysis of these facts.

[16] In the same spirit, Cheng (this volume) argues that Chinese *dōu* plays the same role as definite determiners in languages such as Greek, Basque, and St'át'imcets in that it provides contextual domain restriction inside quantificational phrases (in particular, for strong quantifiers).

4.4.2.1 *Q-det domain restriction in Basque: Lexically strong quantifiers* Unlike in Greek, English, or Spanish, all of the Basque lexically strong Q-dets (*guzti* 'all', *den* 'all', *gehien* 'most', *bakoitz* 'each') compose directly with D yielding [NP [Q-det D]] as the only possible grammatical order. This chapter, in line with Giannakidou's ideas, proposes that the syntactic structure of a Basque lexically strong quantifier is as in (29a).

(29) a. ikasle guzti-ak
student all-D.pl



b. ikasle guztiak = (ikasle) [guzti (C)]

c. $[\![\text{guzti}]\!] = \lambda P\, \lambda Q\, .\, \forall x\, P(x) \rightarrow Q(x)$

d. $[\![\text{-ak}]\!] = \lambda Z_{et,ett}\, .\, \lambda P_{et} \lambda Q_{et}.\, Z\, (P \cap C)\, (Q)$; Z is the relation denoted by the Q-det

e. $[\![\text{guzti-ak}]\!] = \lambda P\, \lambda Q\, .\, \forall x\, (P(x) \cap C(x)) \rightarrow Q(x)$

The result is again restricting the first argument of Z (i.e. Q-det), the NP: so, as it is expressed in (29c), if $Z = \lambda P\, \lambda Q \cdot \forall x\, P(x) \rightarrow Q(x)$, then after *-ak* application we get (29e) which contains a C-restricted P domain (compare 29c with 29e) (see Etxeberria & Giannakidou (2008b) for further discussion).

Then, these strong quantifiers suggest that the quantifier and the D compose together by means of an adjunction procedure (or by incorporating the D to the quantifier) as it has been argued for Greek quantifiers of the same kind in Giannakidou (2004). Hence, the domain restriction introduced by the D creates a new complex quantifier which contains the contextual variable $_C$ and is contextually restricted.[17]

[17] One of the reviewers suggests that, since Q-dets in Basque cannot appear without the definite determiner, it could be the case that there is no compositional process between these two elements at all. This could be a possibility; however, note that Basque strong quantifiers can be combined with demonstratives which would appear in the same position as the definite determiner, as shown in (ia).

(i) a. [Ikasle guzti hauek] berandu etorri ziren.
[student all dem.pl.abs] late come aux.past.pl
'All (of) these students came late.'

b. * [Ikasle guzti] berandu etorri ziren.

I don't think we would like to claim that there is no compositional process in the combination of a quantifier with a demonstrative.

Note that when contextualisation happens at the Q-det level (as is the case with Basque lexically strong quantifiers), the addition of another definite results in ungrammaticality, an ungrammaticality that could be explained in terms of type mismatch, since the Q-det would receive an *e* type argument rather than an ⟨e, t⟩ type argument, as predicted by the standard analysis of generalized quantifiers.

(30) a. * ikasle-**ak** guzti-**ak**
student-D.pl all-D.pl
'the all the students'

b. * ikasle-**ak** den-**ak**
student-D.pl all-D.pl
'the all the students'

c. * ikasle-**ak** gehien-**ak**
student-D.pl most-D.pl
'the most the students'

d. * ikasle-**a** bakoitz-**a**
student-D.sg each-D.sg
'the each the students'

Now, the overt partitive form is also out as shown in (31) below. However, if we assume Ladusaw (1982)'s account of partitives where they provide elements of type ⟨e, t⟩ (cf. section 4.4.2.2), the ungrammaticality of these sentences is unexpected because in this case the partitive structure does not produce any kind of type mismatch as was the case in the examples in (30). In other words, the partitive *ikasleetatik* (lit.: 'student the.pl of') would yield the correct argument (an ⟨e, t⟩ type predicative argument) for the quantifier to quantify over; but still, the constructions in (31) are out.

(31) a. * ikasle-**eta-tik** guzti-**ak**
student-D.pl-abl all-D.pl
'the all of the students'

b. * ikasle-**eta-tik** den-**ak**
student-D.pl-abl all-D.pl
'the all of the students'

c. ?? ikasle-**eta-tik** gehien-**ak**
student-D.pl-abl most-D.pl
'the most of the students'

d. * ikasle-**eta-tik** bakoitz-**a**
student-D.pl-abl each-D.sg
'the each of the students'

Observing the data so far, it is possible to notice that contextually restricting more than once does not yield a type mismatch. The reason these sentences are ungrammatical is (as predicted by this analysis) that domain restriction is already fulfilled by means of the D that composes with the strong Q-dets. The reason why contextual restriction cannot happen more than once should be considered a case of redundancy: what would it mean to contextually restrict more than once? Not much, since contextually restricting does not add any descriptive content, unlike, for example, adjectival or other modification which adds a different description with each application and narrows down the NP domain in an informative way. Notice in this respect that modifying a noun with the same adjective is also redundant unless a different meaning is created:

(32) an old old book

In (32) only one of the adjectives is interpreted as a restrictor. The other is interpreted as a degree modifier like 'very', yielding a meaning: *a very old book*. Hence reduplication of identical modifiers is also prohibited in the usual case; it is then only normal to expect it with contextual restriction. Only here we have ungrammaticality because there is no other available lexical meaning for D; that is, there is no degree meaning like 'very' with D, in contrast with what we see with gradable adjectives like 'old' in (32).[18]

Note that in this chapter (see also Etxeberria 2005) the D is defended to act as a modifier when it plays the role of the contextual domain restrictor (cf. (29d)); but this modification, unlike adjectival or other modification which supplies descriptive content, cannot apply more than once.

(33) a. Jonek txakur polit polit guzti-**ak** erosi zituen.
Jon.erg dog cute cute all-D.pl.abs buy aux
'Jon bought all of the cute, cute dogs.'

b. * Jonek txakur polit polit-**eta-tik** guzti-**ak** erosi zituen.
Jon.erg dog cute cute-D.pl-abl all-D.pl.abs buy aux
'* Jon bought the all of the cute, cute dogs.'

In (33a) only one adjective *polit* is interpreted as a restrictor, the other is interpreted as a degree modifier with the meaning of 'very'. Following the proposal put forward in this chapter (see also Etxeberria 2005), contextual restriction will be applied via the definite determiner. Now, since Ds (or the partitive constructions) supply no descriptive content other than the

[18] Thanks to Anastasia Giannakidou (p.c.) for discussion on this point.

context set $_C$, it cannot apply more than once without redundancy; hence, the ungrammaticality of (33b).[19, 20]

Note that the proposal put forward in this chapter avoids a problem that Matthewson (2001)'s analysis would have to face when applied to Basque nominals. The Basque definite determiner (*-a/-ak*) does not only create *e* type elements but can also appear (assuming Partee (1987)'s type-shifting

[19] Note that the constructions in (31) become grammatical when *ikasleetatik* (lit.: 'student the.pl of') and the lexically strong Q-dets (*guzti* 'all', *den* 'all', *gehien* 'most', *bakoitz* 'each') are pronounced with a pause in between, i.e. separated by a comma, as shown in (ib-c).

(i) a. * Ikasle-eta-tik guzti-ak berandu iritsi ziren.
students-D.pl-abl all-D.pl.abs late arrive aux
'Lit.: The all of the students arrived late.'

b. Ikasle-eta-tik, guzti-ak berandu iritsi ziren.
students-D.pl-abl all-D.pl.abs late arrive aux
'Of the students, all (of them) arrived late.'

c. Ikasle-eta-tik, berandu iritsi ziren guzti-ak.
students-D.pl-abl late arrive aux all-D.pl.abs
'Of the students, all (of them) arrived late.'

However, the constructions in (ib–c) and the ones in (31) cannot be said to be identical; when pronounced with a pause, apart from being grammatical as the example in (ib) shows, quantifiers are allowed to float, as in (ic), but with no pause, the sentences are completely out as the example in (ia) shows. What these examples suggest is that in fact we are not talking about the same construction:

– The ones in (ia) and (31) would be real quantifiers and they behave as such in that (as predicted) they do not accept further restriction on the nominal, since domain restriction has already taken place in the Q-det.
– In the examples in (ib) and (ic), on the other hand, there seems to be a left dislocation of the partitive and the elements do not form a single constituent. Specifically (ic) seems to be a case of split topicalization, similar to what we see in examples like (ii) where the bare nominal *books* and *many* are discontinuous: (ii) Books, I bought many.

[20] Martí (this volume) argues against the idea that domain restriction cannot apply but once. Martí defends that Spanish plural indefinite *algunos* 'some' differs from Spanish plural indefinite *unos* 'some' in that only the former is contextually restricted by means of what Martí claims to be a contextual domain restrictor: *alg-* (absent with *unos*). Since *algunos* can also appear in partitive constructions (e.g. *algunos de los estudiantes* 'some of the students') and since we're arguing that partitives also introduce contextual domain restriction, *algunos* would appear to be contextually restricted two times inside partitives: by *alg-* (on the Q-det) and by the partitive (on the nominal expression).

The problem with Martí's analysis is what to do with the Spanish singular indefinites *algún* 'a' and *un* 'a' which appear to be both contextually unrestricted; something unexpected if *alg-* is always a contextual domain restrictor. Example (i) is taken from Martí (this volume), I only change the plural forms *algunos* and *unos* that appear in her examples for the singulars *algún* and *un*.

(i) Upon arriving at the school and seeing several groups of boys fighting, the principal, sick and tired of seeing the same scene every day, mumbled to himself: 'What a way to begin the day!'. In a panic, he realized that …

a. … *algún* chaval estaba demasiado cerca de la carretera.
boy was too close of the road

b. … *un* chaval estaba demasiado cerca de la carretera.
boy was too close of the road
'… a boy was too close to the road.'

operations) at the quantificational or at the predicative type, as expected (see Etxeberria (2005), Etxeberria (2008)).

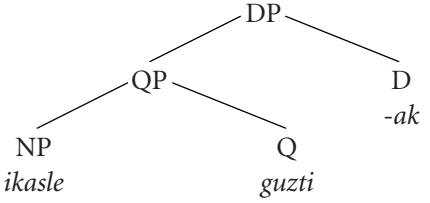
(34) **a. Quantificational: ⟨⟨e, t⟩, t⟩**
Irakasle guzti-ak eta ikasle-**a** goiz iritsi dira.
professor all-D.pl and student-D.sg early arrive aux
'All (of) the professors and the student have arrived early.'

b. Predicative: ⟨e, t⟩
Esther bizkaitarr-**a** da.
Esther Bizkaian-D.sg is
'Esther is (a) Bizkaian.'

Now, let us entertain two alternative analyses for Basque lexically strong quantifiers, which will be shown to be incorrect.

4.4.2.1.1 First incorrect alternative analysis: strong quantifiers create DPs The first of these alternative analyses could be to assume that instead of a quantifier phrase (as in (29a)), what Basque lexically strong quantifiers create are DPs with the structure in (35).

(35)



Let us assume, just for the sake of argument, that the structure in (35) is the correct one. If this was the case, it should be possible to conjoin two QPs, that is, two [NP+Q] sequences in (35), under the same single D in the same way that it is possible to conjoin two NPs or two adjectival phrases (AdjP) under the same D as shown in (36).

NP conjunction

(36) a. [$_{DP}$ [$_{NP}$ Ikasle] eta [$_{NP}$ irakasle]-ak] azterketa garaian
[student and teacher]-D.pl.abs exam period-ines
daude.
aux
'The students and teachers are in exams period.'

Clearly, both the examples in (i) are contextually unrestricted and neither *algún* nor *un* necessarily makes reference to one of the boys who were fighting; in order to do so, we use the partitive. Thus, these examples would show that *alg-* does not behave as a contextual domain restrictor (it clearly doesn't in the singular case in (ia)) and that the reason why the plural indefinite *algunos* is contextually restricted is due to some other reason.

AdjP conjunction

(36) b. Maia-k [$_{DP}$ [$_{AdjP}$ zaldi haundi] eta [$_{AdjP}$ elefante txiki]-ak] ikusi ditu.
Maia-erg [horse big and elephant small]-D.pl.abs see aux
'Maia has seen the big horses and small elephants.'

But contrary to what this alternative analysis predicts, conjoining two strong quantifiers under the same D is completely unacceptable as the ungrammaticality of the following Basque examples clearly show.

(37) a. * [$_{DP}$ [$_{QP}$ Ikasle gehien] eta [$_{QP}$ irakasle guzti]-ak] goiz iritsi ziren.
student most and teacher all-D.pl.abs early arrive aux
'Most of the students and all of the teachers arrived early (intended).'

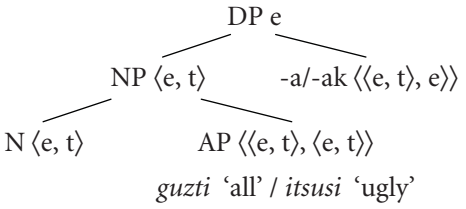
b. * [$_{DP}$ [$_{QP}$ Neska bakoitz] eta [$_{QP}$ mutil guzti]-ek] sari bat irabazi zuten.
girl each and boy all-D.pl.erg prize one win aux
'Each girl and all of the boys won a prize (intended).'

Then, as predicted by the analysis put forward in this chapter, what these sentences come to show is that (i) Basque lexically strong quantifiers create Q-detPs and not DPs headed by the definite determiner, and that (ii) the Basque definite determiner (at least in quantificational phrases) is behaving as a contextual variable that composes together with the Q-det, its function being that of contextually restricting the quantificational domain.

4.4.2.1.2 Second incorrect alternative analysis: Strong quantifiers are adjectives A second tentative analysis would be to treat Basque lexically strong quantifiers as adjectives; in fact, some authors do still maintain that what I here treat as lexically strong quantifiers are not quantifiers but simple adjectives. Following this line of reasoning Trask (2003: 106) claims that 'certain words with quantifier-like meanings are strictly adjectives, including *guzti-guzi* "all", *bakoitz* "each", *gehien* "most" . . .'

However, the implementation of such a claim in terms of type theory would give us something along the following lines.

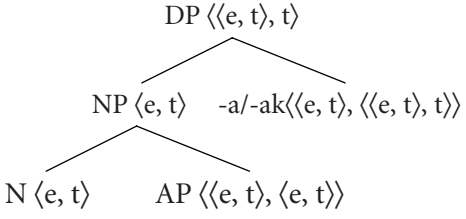
(38)



In (38) the common noun of type ⟨e, t⟩ combines with the adjective (standardly assumed to be) of type ⟨⟨e, t⟩, ⟨e, t⟩⟩ to create another one-place predicate of type ⟨e, t⟩, which, combined with the article *-a/-ak*, would give an individual of type *e* as a result. The reason why I say that *-a/-ak* creates an individual of type *e* is because I assume, following standard assumptions, that the definite determiner, when applied to an NP, gives an individual *e* (either maximal if the NP is plural, or unique if the NP is singular; see Link (1983); cf. Etxeberria (2005) for Basque).

One of the problems that this analysis would have to face is that it is already an established fact that Basque strong quantifiers create GQs, i.e. sets of sets of type ⟨⟨e, t⟩, t⟩ (cf. Etxeberria (2004), Etxeberria (2005) for evidence). If that is the case, and if we continue assuming that Basque lexically strong quantifiers are 'strictly adjectives', the definite determiner *-a/-ak* would have to be the element that forces the whole phrase to be a generalized quantifier and it would thus have to be of type ⟨⟨e, t⟩, ⟨⟨e, t⟩, t⟩⟩ as example (38) shows, rather than ⟨⟨e, t⟩, e⟩.[21]

(39)



In the compositional structure introduced in (39) the combination of the common noun and the adjective yields a one-place predicate of type ⟨e, t⟩ (just as in (38)). However, if we have a model composed of four boys like the one defined in (40), the combination of *mutil* 'boy' and *gehien* 'most' does not denote a single set of type ⟨e, t⟩ (pace example (39)):

(40) M = {a, b, c, d}

[21] This could of course be the case if we were to assume Russell (1905)'s treatment of definites. But Etxeberria (2005) has shown that the Basque definite determiner creates elements of individual type *e*, its different interpretation being a consequence of its type-shifting possibilities.

but rather, it would denote a set of sets as described in (41).

(41) *mutil gehien* = {{a, b, c}, {a, b, d}, {a, c, d}, {b, c, d}, {a, b, c, d}}

A second problem that this analysis would have to face is that Basque lexically strong quantifiers do not behave the way simple adjectives do. Adjectives can interchange their position while the sentence continues being equally grammatical (example (42) is taken from Euskaltzaindia (1993: 119)).[22]

(42) a. herri txiki polit-a.
village small nice-D.sg
'the small nice village'

b. herri polit txiki-a.
village nice small-D.sg
'the nice small village'

A lexically strong quantifier on the other hand cannot change positions with an adjective as example (43) shows.

(43) a. herri txiki guzti-ak
village small all-D.pl
'all (of) the small villages'

b. * herri guzti txiki-ak
village all small-D.pl

It could be argued that the lexically strong quantifiers are *degree* adjectives (a concept that is quite closed to quantification) since in Basque this kind of adjective must always appear last in the adjectival string. A simple way to express degree is by means of the process of reduplication. Note that only the adjectives that appear last in the adjectival string can be reduplicated.

(44) a. ur bero zikin-zikina
water hot dirty-dirty
'dirty-dirty hot water'

b. * ur zikin-zikin beroa
water dirty-dirty hot

(45) a. ur zikin bero-beroa.
water dirty hot-hot
'hot-hot dirty water'

[22] Euskaltzaindia (1993: 119): '*Zer gertatzen da izen baten ondoan izenondo bat baino gehiago jarri nahi dugularik? Zer ordenatan jartzen dira hauek? [. . .] badirudi hiztunak zein hartzen duen garrantzi-izkoentzat huraxe jartzen duela izenaren ondoan*' (What happens when we want to put more than one adjective beside a noun? What order do they follow? [. . .] it seems as though the speaker puts the adjective she believes to be more important beside the noun).

b. * ur bero-bero zikina.
water hot-hot dirty

But if we assume that lexically strong quantifiers are degree quantifiers because they must always occupy the last position in the adjectival string, what would they be degrees of? In a sentence like *ikasle guztiak berandu etorri dira* 'all (of) the students came late' the quantifier *guzti* does not measure the degree of being student. Moreover, (46) is not ungrammatical, contra prediction.

(46) ur zikin-zikin guzti-a
water dirty-dirty all-D.sg
'all the dirty-dirty water'

Further evidence against the claim that these elements are adjectives comes from their impossibility to appear in positions where adjectives are allowed, e.g. predicative positions (see Higginbotham (1987)).

(47) a. Lapurr-ak azkarr-ak ziren.
thief-D.pl smart-D.pl be.pl
'The thieves were smart.'

b. * Lapurr-ak **guzti-ak/den-ak/bakoitz-a** ziren/zen.
thief-D.pl all-D.pl/all-D.pl/each-D.sg be.pl/be.sg
'The thieves were all/all/each.'

So far, then, we have seen for the domain restrictor appearing with the quantifier; now the question is whether Basque shows evidence in favour of the domain restrictor appearing with the nominal expression. With that aim, the next subsection concentrates on partitive contructions, which in fact provide such evidence.

4.4.2.2 *Nominal domain restriction in Basque: Strongly interpreted weak quantifiers (partitives)* In opposition to what happens with the quantifiers in the previous subsection, the strongly interpreted weak quantifiers must appear with partitive forms to be interpreted proportionally. As is the case in English, Greek, or Spanish, Basque nominal restriction happens overtly by means of the D plus the partitive *-tik* 'of'.

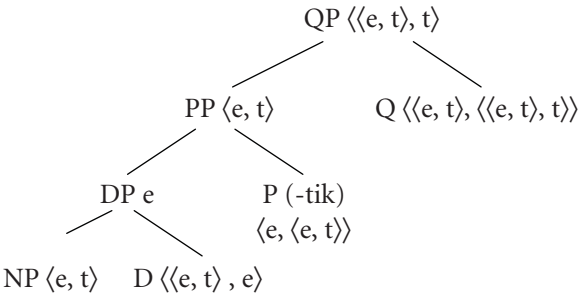
(48) a. [Ikasle-eta-tik **gutxi**] berandu iritsi ziren. (=26a)
[student-D.pl-abl few] late arrive aux.pl
'Few of the students arrived late.'

b. [Ikasle-eta-tik **asko**] berandu iritsi ziren. (=26b)
[student-D.pl-abl many] late arrive aux.pl
'Many of the students arrived late.'

c. [Ikasle-eta-tik **batzuk**] berandu iritsi ziren. (=26c)
[student-D.pl-abl some] late arrive aux.pl
'Some of the students arrived late.'

In Basque, the overt partitive form *-etatik* (which necessarily forms strong quantifiers) is composed of the D *-a* that is not seen due to assimilation with the plural marker *-eta* (the usual plural marker is *-k*),[23] and the ablative marker *-tik*.[24] Thus, the composition of a partitive quantifier will be the one in (49) where the partitive *-etatik* is taken to be providing the nominal domain restriction. First, the combination of the NP and the D creates an object of type *e* which is taken as an argument by the Basque partitive suffix *-tik* to return an element of type ⟨e, t⟩ so that the quantifier takes the proper argument. From this last combination, we get a GQ of the usual type ⟨⟨e, t⟩, t⟩.

(49)



As evidence for the fact that D is actually included in the partitive form *-etatik* note that, in Basque, case is marked by means of suffixes and it is possible to distinguish between the indefinite and the definite paradigms morphologically. *Etxe* means 'house'.

(50)

	indefinite	definite sg.	definite pl.
Ergative	*etxe-k*	*etxe-ak*	*etxe-ek*
Ablative	*etxe-ta-tik*	*etxe-tik*	***etxe-eta-tik***

It is known that partitive constructions like the ones we are considering denote the set of all contextually relevant houses (in this case) and we are arguing that for such constructions the definite determiner is necessary. Now, in principle it would seem possible to create a partitive construction with the indeterminate form of the ablative, but, as the example in (51a) shows, this is completely impossible.

[23] See Azkarate & Altuna (2001) for the historical analysis of the plurality marker *-eta*. See also Manterola (2006).

[24] See Eguzkitza (1997).

(51) a. * etxe-ta-tik asko
house-pl-abl many

b. etxe-eta-tik asko
house-D.pl-abl many

Thus, *-eta* must be taken as a portmanteau morpheme that marks both number and definiteness features in a single morpheme.[25] As was the case with Basque lexically strong quantifiers, and as predicted by the fact that these quantifiers are also contextually restricted (by means of the overt partitive), further definites will not be allowed.[26]

(52) a. * ikasle-eta-tik asko-**ak**
student-D.pl-abl many-D
'the many of the students'

b. * ikasle-eta-tik gutxi-**ak**
student-D.pl-abl few-D
'the few of the students'

c. * ikasle-eta-tik zenbait-**ak**
student-D.pl-abl some-D
'the some of the students'

Note also the difference between the structure offered for the quantifiers of St'át'imcets (see example (15)) and the one we are offering for Basque partitives. Recall that St'át'imcets does not possess overt partitive forms and that a covert type-shifter has been proposed in order for the Q-det to combine with an argument of the correct type, i.e. predicative type ⟨e, t⟩. On the contrary, Basque does possess an overt partitive form (*-tik* 'of') and this excludes the

[25] Cf. Etxeberria (2005) for an extended explanation of these facts.

[26] One interesting case is the Spanish counterpart of *most* which happens to be necessarily partitive but quite unexpectedly (since contextual restriction is defended to happen only once); it also needs a D at the beginning. This property makes *la mayoría de DP* different from the rest of Spanish strong quantifiers (i.e. *cada chico* 'each boy', *todo chico* 'every boy', *muchos de los chicos* 'many of the boys').

(i) La mayoría de los estudiantes suspendieron el examen.
the.sg majority of the.pl students failed the exam
lit.: 'The most of the students failed the exam.'

Something similar seems to be happening with Greek *i perissoteri* (Giannakidou 2004: 13) 'which exhibits the D QP order while at the same time optionally allowing a definite argument'. Giannakidou solves the problem of Greek *i perissoteri* appealing to definite reduplication. However, this solution does not seem to be applicable to Spanish since the first D does not depend on the second (internal to the partitive) D and it might well be the case that they are different (see ex. (i)). What seems to be going on in Spanish is that *mayoría* is not a quantifier but a noun, and that the first D in *la mayoría de los NP* is there just for syntactic reasons since bare nouns (particularly singular ones) are not allowed in Spanish (cf. Bosque (1996)).

possibility of covertly type-shifting the contextually restricted noun as the examples in (61) clearly show.

(53) a. * ikasle-**ak** Ø asko
student-D.pl many
'many the students'

b. * ikasle-**ak** Ø gutxi
student-D.pl few
'few the students'

c. * ikasle-**ak** Ø zenbait
student-D.pl some
'some the students'

Thus, it seems correct to conclude that (i) Basque provides clear evidence for the need of both Q-det as well as nominal domain restriction depending on whether the quantifiers are lexically strong or partitives;[27] (ii) contextual restriction happens only once: when domain restriction happens in the Q-det, partitive forms (that restrict the nominal expression) are not allowed and vice versa; and (iii) the standard analysis of generalized quantifiers (with Giannakidou (2004)'s innovation) is correct (pace Matthewson (2001)).

4.4.3 *Weak quantifiers are not contextually restricted*

Up until now, we have argued that natural language quantifiers must be contextually restricted, and have shown that this restriction is realized overtly by means of the D in some languages, e.g. Basque. Now, recall from section 4.4.1.1 that Basque weak quantifiers do not appear with the D (as opposed to strong ones that must appear with it) as exemplified in (54)–(55) (repeated from (20)–(21)).

(54) a. [**Zenbait** politikari] berandu iritsi ziren.
[some politician] late arrive aux.pl
'Some politicians arrived late.'

b. * [**Zenbait**(-**ak**) politikari(-**ak**)] berandu iritsi ziren.

[27] One of the reasons why lexically strong quantifiers and partitives show a different behaviour (in that the former restrict the Q-det while the latter restrict the noun by means of a partitive structure) may be due to the fact that Basque lexically strong quantifiers historically derive from adjectives (cf. Trask (2003: 128) and adjectives in Basque do necessarily appear with *-a*/*-ak*. Nowadays, lexically strong quantifiers do not behave like adjectives and denote GQs (see section 4.4.2.1; see also Etxeberria (2004), Etxeberria (2005)). Thanks to Joseba Lakarra for discussion on this point.

(55) a. [Politikari **asko**] berandu iritsi ziren.
[politician many] late arrive aux.pl
'Many politicians arrived late.'

b. * [Politikari(-**ak**) **asko**(-**ak**)] berandu iritsi ziren.

Since the D domain restrictor does not appear with weak quantifiers, Basque shows in the overt syntax (cf. Etxeberria (2005)) that, in fact, so-called weak quantifiers are unrestricted, and that as a consequence they must not be considered (real) quantifiers generated at the quantificational type ⟨⟨e, t⟩, ⟨⟨e, t⟩, t⟩⟩ (cf. Milsark (1979), Partee (1988), Kamp & Reyle (1993), Geenhoven (1998), Landman (2003)).

Hence, weak quantifiers are proposed to be cardinality predicates which are base-generated as being of predicative type ⟨e, t⟩. As a matter of fact, note that in opposition to strong quantifiers, they are grammatical in predicative position as exemplified in (56) vs. (57) and (58).

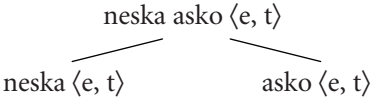
(56) Gonbidatu-ak [ikasle asko/batzuk/gutxi] ziren.
guest-D.pl student many/some/few be.pl
'The guests were many/some/few students.'

(57) * Gonbidatu-ak [ikasle **guzti-ak/den-ak/bakoitz-a**] ziren/zen.
Guest-D.pl [student all-D.pl/all-D.pl/each-D.sg] be.pl/be.sg
'The guests were all of the students/all of the students/each student.'

(58) * Gonbidatuak [ikasle-**eta-tik** **asko/batzuk/gutxi**] ziren.
guest.D.pl [student-D.pl-abl many/some/few] be.pl
'The guests were many of the students/some of the students/few of the students.'

The proposal that this chapter puts forward is that the combination of a cardinal-weak quantifier like *asko* with an NP predicate like *neska* (which following standard assumptions is also of type ⟨e, t⟩) will be carried out through intersection (cf. Landman (2003)), yielding an element of type ⟨e, t⟩ as a result. This is the way they are interpreted when in predicative position and their structure will be the one in (59) (to be specified below).

(59)



Furthermore, the reason why weak quantifiers do not appear with the D is due to the fact they are syntactically base-generated in number phrase, below the DP projection.[28] It is precisely this property (together with the fact that

[28] Cf. Etxeberria (2005) for a detailed analysis.

they are unrestricted) that prevents weak-cardinal quantifiers from appearing with Ds. But this cannot be the whole story since numerals (which are also weak quantifiers) can be combined with the D, in opposition to the rest of the Basque weak quantifiers (cf. Etxeberria (2005), Etxeberria (2008)).

(60) Zazpi ikasle-ek goxoki-ak jan zituzten.
seven student-D.pl.erg candy-D.pl.abs eat aux.pl
'The seven students ate (the) candies.

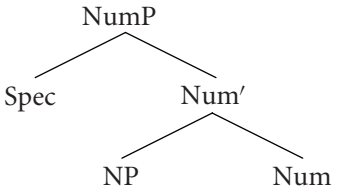
The difference between pure cardinal words (numerals) and the rest of (Basque) weak quantifiers is semantic in nature: while the former can be definite and referential due to the fact that they are specified for number, the latter cannot. When we utter something like *zazpi ikasle* 'seven students' we are speaking about a set of seven students (not seventy-two) and when we want to refer to them as a plural specific/referential set we make use of the D. On the other hand, the rest of weak quantifiers cannot make reference to a specific set the way numerals can, since their exact number is clearly unspecified (as asserted in Milsark (1979)), hence the impossibility to be combined with the D (cf. Etxeberria (2005), Etxeberria (2008) for extensive discussion on this). The only construction where these unspecified weak quantifiers allow D is the partitive construction where their interpretation is the proportional one and their behaviour is parallel to that of strong quantifiers (cf. section 4.4.2.2).

Although not overtly discussed in the chapter, there is a correlation between (i) the impossibility of D with weak quantifiers (except for numerals) and (ii) the possibility of using the partitive. The question that remains is why it is that the latter (the use of the partitive) is only allowed for weak quantifers in Basque and in languages in general, where partitivity seems to be the only means to D-restrict weak quantifiers. The reason why this is so is because weak quantifiers in their cardinal interpretation are of type ⟨e, t⟩ (as proposed in this subsection; see example (59)), hence not the right input to D-restriction (which needs ⟨⟨e, t⟩, ⟨⟨e, t⟩, t⟩⟩ type elements as shown in (29)).

Thus, following (59), the syntactic structure of a weak-cardinal expression in predicative position is the one in (61). This structure is of predicative type ⟨e, t⟩.[29]

[29] Note that I am assuming a head-final structure for Basque. The Spec position will always be to the left. See among others Ortiz De Urbina (1989), Laka (1990), Elordieta (2001), and Artiagoitia (2000). Ortiz De Urbina (1989) and Laka (1990) claim that left-periphery projections (focus, negation, wh-head, etc.) are head-initial; this differentiation creates an asymmetry in Basque syntax. On the contrary, Haddican (2001), Haddican (2004), Haddican (2005) suggest, following Kayne (1994), that Basque is always head-initial.

(61)



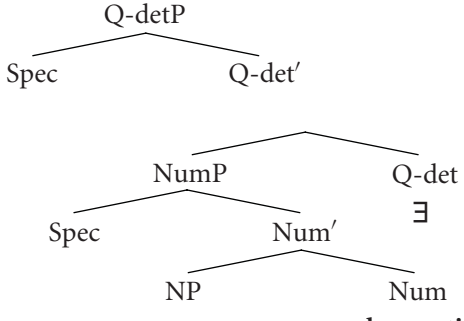
weak quantifiers

However, the predicative interpretation is not the only interpretation that cardinal weak quantifiers (without overt partitives) may get and they can also appear in argument position. In this position ⟨e, t⟩ type objects are not allowed and either an entity type *e* element or a quantificational type ⟨⟨e, t⟩, t⟩ element is needed. When in argument position, weak cardinal quantifiers can get a cardinal or a proportional interpretation as the example (62) illustrates (cf. Partee (1988)).

(62) Ikasle asko-k goxoki-ak jan zituzten.
student many-erg candy-D.pl eat aux.pl
'Many students ate candies.'
→ CARDINAL: many in number
→ PROPORTIONAL: many (of the) students

In order to get the cardinal interpretation we will make use of a silent existential quantifier. This existential quantifier (∃) will be of quantificational type ⟨⟨e, t⟩, ⟨e, t⟩, t⟩⟩ and, in combination with *ikasle asko* (which is of type ⟨e, t⟩; see ex. (59)), will create a generalized quantifier of the usual type ⟨⟨e, t⟩, t⟩ that then can combine with the VP to give a truth value. This implicit existential quantifier will be placed in Q-det and the logical form that we will get for a subject of a sentence like (62) will be (63).

(63) [[∃x [ikasle(x) & asko(x)]]



weak quantifiers

Therefore, in argument position the cardinal interpretation of indefinite noun phrases is derived from predicative interpretations through a type-lifting process by means of a silent existential quantifier (see Landman (2003)). This operation takes a set of individuals x and maps it onto a generalized quantifier, that is, the set of all sets that have a non-empty intersection with x.

For the proportional reading on the other hand, I adopt Büring (1996), where the covert partitive phenomenon is approached from a pragmatic point of view. In contrast to the Semantic (Ambiguity) Approach (cf. Partee (1988), Diesing (1992), de Hoop (1992)), where the cardinal and the proportional readings are claimed to be fixed from the lexicon, Büring argues that weak quantifiers are not ambiguous: their proportional (and therefore presuppositional) interpretation depends on the Topic/Focus/Background Structure (TFBS) and consequently there is no need to postulate a covert partitive structure when no overt partitive is overt.

Thus, following Büring (1996), I assume that sentences of the kind in (64a) involve two accents, the first of which is not a focus accent but a contrastive topic accent. Such a sentence triggers the reconstruction of a particular set of potential contexts: the ones obtained by substituting the weak quantifier in subject position *batzuk* 'some' in (64a) for its contextually relevant alternatives given in (64b).

(64) a. Ikasle [BATZUK]$_T$ [GARAGARDO-A]$_F$ edan zuten.
student some.erg beer-D.abs drink aux
'SOME students drank BEER.'

b. What did some students drink? What did all of the students drink? What did five students drink? What did few students drink? What did many students drink?

No matter which of the previous contexts might have been the actual discourse-topic, all of the alternatives in (64b) give rise to elements able to occupy a topic position and as a consequence the existence of a group of students is presupposed. Thus, it is possible to know upon hearing (64a) – even in a discourse-initial context – that it requires a discourse context that has to do with students. The partitive interpretation of *ikasle batzuk* in (64a) results from the fact that the noun, but not the weak quantifier, is part of the background, that is to say, the partitive/presuppositional reading emerges as a result of the contexts required by the sentence.

As evidence in favour of this analysis, note that Basque weak quantifiers in non-topic/focus position can only obtain weak cardinal readings.

(65) Amaia-k irakurri ditu liburu asko.
Amaia-erg read aux book many
'Amaia has read many books.'
√ CARDINAL: many in number
* PROPORTIONAL: many (of the) students

In (65), the subject appears in (preverbal) focus position and *liburu asko* 'many books' is part of the 'theme' (cf. Vallduví (1993) and references therein); hence, it is part neither of the topic nor the focus of the sentence.

This subsection has given evidence for the fact that weak-cardinal quantifiers must be contextually unrestricted. This property is something that Basque shows in the overt syntax since, in opposition to strong quantifiers, weak ones do not appear with the definite determiner, which this chapter defended to introduce a contextual domain restrictor.

4.5 Conclusions

One of the most important theoretical conclusions of this chapter is that natural language quantification is contextually restricted by implicit or explicit domain variables. Furthermore, we must allow for nominal as well as Q-det restriction; Basque is in this concern a language whose generalized quantifiers provide clear evidence for the need of both ways of restriction depending on whether they are lexically strong or partitive quantifiers. Lexically strong quantifiers must be taken as evidence for Q-dets composing with D; strongly interpreted weak quantifiers, on the other hand, create partitive forms, and as in English, Greek, or Spanish nominal restriction happens overtly by means of the partitive construction.

Another conclusion is that the assumption that the Q-detP internal D determiner is a nominal domain restrictor (Giannakidou (2004)) makes it unnecessary to revise the standard generalized quantifier theory. In fact, as we've seen in section 4.4, Basque data provide further support in favour of this conclusion.

With respect to weak quantifiers, it has been defended that weak quantifiers are contextually unrestricted and that Basque shows this difference between strong and weak quantifiers in the overt syntax since, in opposition to strong quantifiers, they do not appear with the definite determiner. Hence, weak quantifiers have been argued to be cardinality predicates and to be generated at the predicative type ⟨e, t⟩ semantically (Geenhoven (1998), Landman (2003)), and in the functional projection NumP syntactically.

Finally, concerning the proportional partitive interpretation of weak quantifiers when there is no overt partitive '*of the*', I have adopted Büring (1996), where the covert partitive phenomenon is approached from a pragmatic point of view, that is, the proportional interpretation of weak quantifiers depends on the Topic/Focus/Background Structure. Therefore, this reading will not be due to the presence of a covert partitive construction (pace Partee (1988)).

5

Contextual restrictions on indefinites: Spanish *algunos* vs. *unos*[1]

LUISA MARTÍ

5.1 Introduction

In this chapter I argue that the Spanish plural indefinite *algunos*, an existential quantifier (see Martí (2008) and cf. Gutiérrez-Rexach (1999a), Gutiérrez-Rexach (1999b), Gutiérrez-Rexach (2001) and others), introduces a contextual variable. I blame *alg-* for the context dependence of *algunos*, absent with *unos*. The chapter builds on the analysis of *unos* and *algunos* that I propose in Martí (2008) and adds an additional layer to the 'indefinite hierarchy' defended there. In order to determine exactly where in the indefinite hierarchy context dependence should be located, I use data from Brazilian Portuguese that contrasts in certain crucial respects with the Spanish data.[2]

The chapter thus argues that existential quantifiers, just like other quantifiers, can be contextually restricted (cf. Fintel (1994), Martí (2003), among others). It also shows that indefinite contextual restriction can be overt in some languages, extending to indefinites the proposal by Etxeberria (2005), Etxeberria (this volume), Giannakidou (2004), Etxeberria & Giannakidou (2008a) and Matthewson (2001) that quantificational domain restriction can be effected overtly in some languages – though in the case of *algunos*, and perhaps generally for indefinites, this does not come about via the definite

[1] Thanks to Klaus Abels, Ana Paula Quadros, Isabel Pérez Jiménez, two anonymous reviewers and the organizers and participants of the workshop 'QP structure, nominalizations and the role of DP' (Universität des Saarlandes in Saarbrücken, Germany, in December 2005), most of all Urtzi Exteberria, Anastasia Giannakidou (who gave very detailed written comments on this material), Monika Rathert, and Arnim von Stechow. All errors are of course my own.

[2] The variery of Spanish represented here is the one spoken in Madrid, Spain, and its surroundings. For speakers of other varieties, as pointed out in Martí (2008), there might be fewer differences between *unos* and *algunos*.

determiner. The chapter also contributes to the debate (in addition to the references above, see Stanley (2002)) about where in the quantificational phrase context dependence is located: with the quantifier itself, or with the noun that accompanies the quantifier. If *alg-* is responsible for context dependence, then the option of locating context dependence on the quantifier must be allowed. And, if we are to properly draw the distinction between *unos* and *algunos*, context dependence cannot ever come from the noun in Spanish.

The organization of the chapter is as follows. In section 5.2, I introduce the basic context dependence facts. This section also contains an argument that the difference between *algunos* and *unos* is not presuppositional. In section 5.3, I introduce the basics of the decompositional analysis in Martí (2008) and show that a simple extension of that analysis allows us to capture the facts from section 5.2. I also discuss Brazilian Portuguese in this section. In section 5.4, I discuss consequences of this proposal for our views on domain restriction and quantification and for the proposal made in Etxeberria (2005), Etxeberria (this volume), Giannakidou (2004), Etxeberria & Giannakidou (2008a). This section also contains a brief discussion on *algunos de los* ('some of the'). Given the well-known subtlety of the judgements involved here, special care has been taken in the collection of the data; section 5.5 discusses the procedure that was followed. Section 5.6 is the conclusion.

5.2 The context dependence of *algunos* and the context independence of *unos*

The semantics of the Spanish plural indefinites *algunos* and *unos* has received some attention in the recent literature (see Alonso-Ovalle & Menéndez-Benito (2002), Gutiérrez-Rexach (1999a), Gutiérrez-Rexach (1999b), Gutiérrez-Rexach (2001), Laca & Tasmowski (1996), Martí (2008) and Villalta (1994)).[3] Consider (1):

(1) a. Llegaron *algunos*/*unos* chicos a la oficina.
arrived boys to the office
'*Algunos*/*unos* boys arrived to the office.'

b. Hay *algunos*/*unos* libros sobre la mesa.
are books on the table
'There are *algunos*/*unos* books on the table.'

[3] Alonso-Ovalle & Menéndez-Benito (2003) study the properties of the singular version of *algunos*, *algún*. The analysis below makes certain predictions about *algún* (and *un*, the singular version of *unos*) which I don't investigate here.

As the translations in these examples show, it is often difficult to tease apart the semantic contribution of *unos* from that of *algunos*. As we will see in this chapter, however, and as has been shown before, there are a number of interesting differences between the two. This section of the chapter concentrates on context dependence: the absence of it in the case of *unos*, and its presence with *algunos*. Section 5.2.1 presents the crucial facts. Section 5.2.2 argues that presuppositionality is not what differentiates *unos* from *algunos*.

5.2.1 *The data*

Let us start by considering the examples in (2) (cf. (1a)):[4, 5]

(2) {Teachers A and B are on an excursion with a group of children, of whom they are in charge. Teacher A comes running to teacher B:}

a. Teacher A: ¿Te has enterado? *Algunos* niños se han
cl have found.out children cl have
perdido en el bosque.
got.lost in the forest

b. Teacher A: ¿Te has enterado? *Unos* niños se han perdido en el bosque.
'Have you heard? *Unos*/*algunos* children got lost in the forest.'

In (2a), teacher A says that some of the children he and teacher B are in charge of got lost in the forest. (2b) says something different: teacher A says that some children got lost in the forest, but he doesn't mean the children he and teacher B are in charge of. This is a subtle difference between (2a) and (2b) that can be sharpened by considering the continuations in (3) and (4):

(3) {After a few hours, teachers A and B discover that none of the children from their group had actually got lost; it was children from a neighbouring village:}
Teacher A: We are so fortunate that what I said turned out to be false – we don't have to give bad news to any parent!

(4) Teacher A: But at least all of our kids are back.

The Spanish version of (3) is a felicitous continuation for (2a), though not for (2b). The Spanish version of (4) is a felicitous continuation for (2b), though not for (2a). This confirms our initial intuitions about (2). (2a) can be followed

[4] Thanks to Michal Starke for discussion of a similar example. Some of the examples in the text are adapted from Gutiérrez-Rexach (2001).

[5] 'Cl' stands for 'clitic'. *Me* is the 1st person singular clitic; *te* is the 2nd person singular clitic, and *le*, the 3rd person singular one. *Les* is the plural version of *le*, and *se* is another clitic that has several functions in the language.

by (3) because it ends up being false that some of the children from their group had got lost and this is compatible with some other children getting lost, such as those from the neighbouring village; it cannot be followed by (4) because (4) contradicts it: if some of their children have got lost, it cannot be that all of them are back. The behaviour displayed by *algunos* here is context-sensitive behaviour: the group of children that the teachers are in charge of is salient in the context of (2a)[6] and *algunos* is sensitive to that. *Unos*, on the other hand, seems to be context-insensitive. Even though the same group of children is salient in the context of (2b), it is not possible to follow (2b) with (3) but it is possible to follow it with (4) – suggesting that in (2b) *unos niños* does not establish a relationship with a previously established discourse entity.

The examples in (5) and (6) make the same point; (5) is constructed on the basis of an attested example:

(5) Question asked by reader in online interview: In which areas of the world is the AIDS problem the worst?

a. Answer by doctor: In Sub-Saharan Africa, doubtlessly . . .

Hay *algunos* países que podrían
there.are countries that could
desaparecer si no se les presta ayuda para
disappear if not cl cl offer help for
combatir la enfermedad.
fight the disease

b. Answer by doctor: In Sub-Saharan Africa, doubtlessly . . .
#Hay *unos* países que podrían desaparecer si no se les presta ayuda para combatir la enfermedad.

'There are *unos*/*algunos* countries that could disappear if they don't receive help to fight the disease.'

(5) is based on an online interview in *El País*. In this interview, a doctor who specializes in AIDS is asked questions by readers. (5a) is adapted from an answer provided by this doctor; by *algunos países*, the doctor means 'some countries in Sub-Saharan Africa'. In (5b), we try to replace *algunos* with *unos*, but that produces infelicity. The doctor seems to be talking about countries other than Sub-Saharan African countries. But that doesn't address the question asked by the reader: where are these countries? Again, whereas *algunos* seems to have no problem establishing a relationship with a previously introduced entity, such as Sub-Saharan African countries, *unos* seems incapable of

[6] By, for example, being explicitly mentioned, or by being inferred.

doing so and, when doing so would be relevant and called for, *unos* gives rise to infelicity.

(6) Upon arriving at the school and seeing several groups of boys fighting, the principal, sick and tired of seeing the same scene every day, mumbled to himself: 'What a way to begin the day!'. In a panic, he realized that …

a. … *algunos* chavales estaban demasiado cerca de la carretera.
boys were too close of the road

b. … *unos* chavales estaban demasiado cerca de la carretera.
'… *unos*/*algunos* boys were too close to the road.'

We observe in (6a) that the boys who are too close to the road are some of those who are fighting, which constitutes an entity previously introduced in the discourse. In (6b), the boys who are too close to the road are not some of those who are fighting.[7]

Leonetti (1999: 842) offers (7):

(7) Se han salvado doce pasajeros. {#*Unos*/*Algunos*} estaban
cl have saved twelve passengers were
durmiendo en el momento del accidente.
sleeping in the moment of.the accident
'Twelve passengers were saved. *Unos*/*algunos* were sleeping at the time of the accident.'

[7] A modification of (6) changes things for *algunos*; using the existential construction allows *algunos* not to establish a link with a previously introduced entity (see Gutiérrez-Rexach (2001)'s example (58) for more examples of this kind):

(i) {same as in (6)}

a. … había *algunos* chavales demasiado cerca de la carretera.
there.were boys too close of the road

b. … había *unos* chavales demasiado cerca de la carretera.
'… there were some boys too close to the road.'

In (ia), the boys who are too close to the road can be some of those who are fighting, but they don't have to be. *Algunos* is possible also in at least some generic statements (e.g. *Algunos unicornios tienen cuernos de apariencia metálica* '*Algunos* unicorns have horns of metallic appearance', from Martí (to appear)), and these kinds of statements call for unrestrictiveness.

How can (ia) be reconciled with the generalization in the text? Notice that it will not do to say that *algunos* is sometimes context-sensitive and sometimes not, since this would predict, contrary to fact, that (4) should be a good continuation for (2a) (the context-independent version of *algunos* would make it good). Other hypotheses that are worth exploring are that domain restriction with indefinites works differently from domain restriction with 'strong' quantifiers, or that, given the syntactic difference between (6a) and (ia), the syntactic context can affect the context dependence of indefinites (with the additional possibility that these two hypotheses are actually the same: the way that domain restriction is different with indefinites is that the syntactic context can manipulate it). More work is obviously needed in this area. Thanks to Anastasia Giannakidou for discussion of this issue.

With *algunos* in (7) there is no problem establishing a link with the previously introduced entity, the twelve passengers. The second sentence means that some of those twelve were sleeping when the accident happened. It is not possible to use *unos*: a link with a previously introduced entity is impossible with it, but a coherent interpretation of the discourse in (7) would seem to require it.

We can further appreciate the difference between *unos* and *algunos* by considering contexts which make no entity available for future reference. In such contexts, it is impossible to use *algunos*, though sentences with *unos* are felicitous:

(8) {A and B are mathematicians at the university in Saarbrücken. A comes running to B. Children are something that hasn't been on their minds or conversations for a long time:}

a. A: ¿Sabes qué? #¡*Algunos* niños han conseguido resolver la conjetura de Poincaré!

b. A: ¿Sabes qué? ¡*Unos* niños han conseguido resolver la conjetura de Poincaré!
'You know what? Some children have managed to solve Poincaré's conjecture!'

(9) {A and B work at an agency for the prevention of car accidents. A is already at work, and B is just now arriving, and he is quite agitated. Children are something that hasn't been on their minds or conversations for a long time:}

a. B: ¡Dios mío! #¡*Algunos* niños están jugando demasiado cerca de la carretera!

b. B: ¡Dios mío! ¡*Unos* niños están jugando demasiado cerca de la carretera!
'Oh my God! Some children are playing too close to the road!'

5.2.2 *Presuppositionality*

In this section I argue that presuppositionality is not a difference between *unos* and *algunos*, that is, that *alg-* is not presuppositional (in addition to being context-dependent or as an alternative to context dependence). What we have seen so far is that, in an example such as (2a), *algunos niños* is interpreted as 'some of the children salient in the context'. I now show that the extra information not represented explicitly on the surface string does not come about via a presupposition. I also show here that another potential presupposition,

that the set denoted by the head noun be non-empty (cf. Gutiérrez-Rexach (2001)), is not a presupposition but an entailment, of both *unos* and *algunos*.

In order to understand the tests that I will use, consider first the behaviour of the presupposition of *both*. *Both* triggers the inference that the cardinality of the set denoted by the head noun is two. For example, (10) triggers the inference that there are exactly two girls:[8]

(10) Both girls have three A's.

This inference we call a presupposition. There are at least two other inferences that can be drawn from (10): first, if Mira is one of the girls, then she has three A's; second, both girls have exactly three A's. The first of these two inferences we call an entailment, and the second an implicature. How can we tease presuppositions apart from entailments and implicatures? Presuppositions are special in that they cannot be cancelled (implicatures can) and in that they do not pass the *wonder*-test (entailments do). (11b) shows that presuppositions cannot be cancelled:

(11) Of course both girls have three A's!

a. #In fact, Mira has two.

b. #In fact, there is only one girl.

c. In fact, Mira has four.

Implicatures can be cancelled ((11c)), though entailments, like presuppositions, cannot be cancelled ((11a)). To distinguish entailments from presuppositions, we can use the *wonder*-test:

(12) Bill wonders whether both girls have three A's.

a. He is not sure that Mary does.

b. #He is not sure there are two girls.

That is, when Bill wonders about something, he wonders about its entailments, not its presuppositions. Entailments pass this test, not presuppositions.

Let us start by testing *unos*. According to the results of the tests in (13) and (14), *unos* does not induce the presupposition that the set denoted by the head noun, *gorilas asiáticos* 'Asian gorillas' is non-empty:

(13) Trajeron *unos* gorillas asiáticos al zoo. #De hecho, no queda ninguno.
'They brought some Asian gorillas to the zoo. In fact, there are none left.'

[8] See, for example, Chierchia & McConnell-Ginet (1990), chapter 1 for more on these kinds of tests.

(14) Juan se pregunta si habrán traído *unos* gorilas asiáticos al zoo. No está seguro de que quede ninguno.
'Juan wonders whether they brought ('futuro perfecto') some Asian gorillas to the zoo. He is not sure there are any left.'

This piece of information is rather an entailment, since it behaves like one: it cannot be cancelled ((13)), but it can be wondered about ((14)). *Algunos* patterns like *unos* here:

(15) Trajeron *algunos* gorilas asiáticos al zoo. #De hecho, no queda ninguno.
'They brought some Asian gorillas to the zoo. In fact, there are none left.'

(16) Juan se pregunta si habrán traído *algunos* gorilas asiáticos al zoo. No está seguro de que quede ninguno.
'Juan wonders whether they brought ('futuro perfecto') some Asian gorillas to the zoo. He is not sure there are any left.'

Thus, both *unos* and *algunos* induce the entailment that the set denoted by the head noun is non-empty. The inappropriateness of the continuations in (13) and (15) is likely due to the existential import of the two indefinites.

Now we test whether *algunos N* induces the presupposition that there are salient Ns in the context. That is, for a sentence like (2a), the presupposition induced by *algunos* would be that there are children in Teacher A and B's group; for (5a), that there are countries in Sub-Saharan Africa; for (6a) that there are boys fighting. Note that it is unclear how exactly these presuppositions would be derived without at some point assuming that there is something (e.g. a variable) that is sensitive to contextual information (because the presuppositions will change with the context). But since it is possible to show that these bits of information do not behave like presuppositions, we do not have to worry about this problem.

Consider (5a), repeated as (17), and its two modifications in (18) and (19):

(17) Question asked by reader in online interview: In which areas of the world is the AIDS problem the worst?

Answer by doctor: In Sub-Saharan Africa, doubtlessly . . .
Hay *algunos* países que podrían desaparecer si no se les presta ayuda para combatir la enfermedad.
'There are some countries that could disappear if they don't receive help to fight the disease.'

We test whether the following modified versions of (17) are felicitous. The modifications have to do with the fact that, given real-world knowledge, it

would be rather strange to deny or wonder about the existence of certain countries, but not about the existence of governments with the necessary resources to fight AIDS:

(18) Question asked by reader in online interview: In which areas of the world is the AIDS problem the worst?

Answer by doctor: In Sub-Saharan Africa, doubtlessly . . .
Hay *algunos* gobiernos con los recursos necesarios que se están preparando para prestar ayuda. #De hecho, no existen gobiernos con tales recursos en el África Subsahariana.

'There are some governments with the necessary resources that are getting ready to help. In fact, there exist no governments with such resources in Sub-Saharan Africa.'

(19) Question asked by reader in online interview: In which areas of the world is the AIDS problem the worst?

Answer by doctor: In Sub-Saharan Africa, doubtlessly. Our attempts at containment in this area have so far failed, and . . .
los políticos de los países ricos se están preguntando si *algunos* gobiernos con los recursos necesarios estarían preparados para prestar ayuda. No están seguros de que existan gobiernos con tales recursos en el África Subsahariana.[9]

'Politicians in rich countries are wondering whether some governments with the necessary resources would be prepared to help. They are not sure there exist governments with such resources in Sub-Saharan Africa.'

We understand the doctor's answer to mean that policitians wonder whether some governments with the necessary resources in African Sub-Saharan countries would be prepared to help, and that they are wondering about this because they are not sure whether such governments exist. Hence, it is possible to wonder about this piece of information, and this, together with (18), tells us that the information that there exist governments with the necessary resources

[9] The continuation 'In fact, there exist no governments with the necessary resources' is impossible in (18), and in (19) it is possible to follow up with 'They are not sure there exist governments with such resources', suggesting, again, that *algunos* does not presuppose that the set denoted by the head noun is not empty. It just entails this bit of information.

in Sub-Saharan Africa is an entailment, not a presupposition, of the sentence with *algunos*.

5.3 Context dependence and the indefiniteness hierarchy

In this section I propose an analysis in which *alg-* is responsible for the context dependence of *algunos*. Since *unos* does not contain *alg-*, it straightforwardly follows that *unos* is not context-dependent (unless context dependence came from somewhere else; see section 5.4 for more on this). The analysis builds on the proposal in Martí (2008), which already captures some other differences between the two indefinites.

The data from Spanish is informative in that it tells us that context dependence must be built somewhere high in the indefinite hierarchy, but consideration of Spanish alone does not help in determining the exact location of this dependence. Data from Brazilian Portuguese will allow us to do just that.

The organization of this section is as follows. In section 5.3.1, I summarize the relevant aspects of the proposal in Martí (2008). In section 5.3.2 I show how to extend that analysis so as to capture the context dependence facts. In section 5.3.3 I consider the Brazilian Portuguese data. Section 5.3.4 summarizes the main points of this section.

5.3.1 *The indefiniteness hierarchy*

In Martí (2008), I investigate a number of additional properties of *unos* and *algunos* and propose the indefiniteness hierarchy to account for them. In addition, I compare Spanish with Brazilian Portuguese *uns* and *alguns*, which differ from their Spanish counterparts in certain interesting respects. And I also compare the behaviour of *un(o)s* and *algun(o)s* with bare plurals. The empirical generalizations defended in that paper are as follows:

(20) Spanish bare plurals are semantically singular. *Un(o)s*, *algun(o)s* and Brazilian Portuguese bare plurals are, on the other hand, semantically plural.

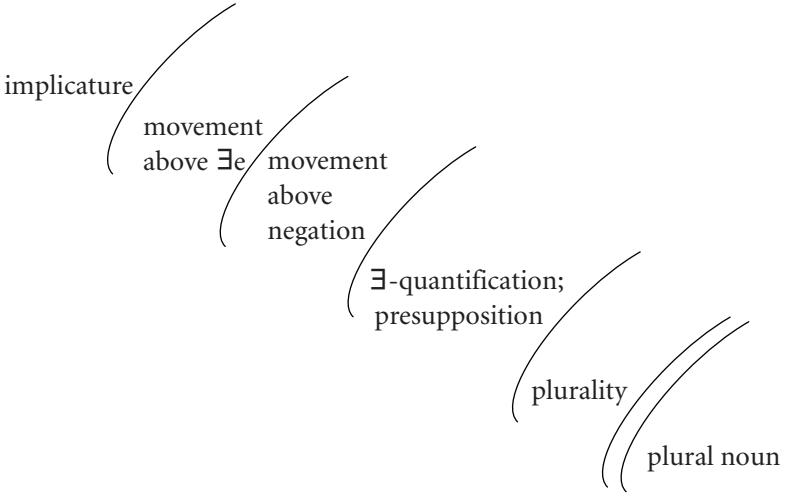
(21) *Un(o)s* and *algun(o)s* are positive polarity items. Bare plurals in either language are not.

(22) *Algun(o)s* induce a partitive implicature. *Un(o)s* and bare plurals in either language do not.

(23) *Algun(o)s*, *uns* and bare plurals in Spanish event-distribute. *Unos* and bare plurals in Brazilian Portuguese do not.[10]

The hierarchy in (24) is proposed in order to account for these facts. This hierarchy is a structured template that contains the basic building blocks for indefinites, and, ideally, it is cross-linguistically valid.[11] The analysis hinges on the idea that lexical items can spell out different parts of the structure in (24):

(24)



The relevant presupposition introduced at the presupposition and existential quantification layer is a presupposition that, in the spirit of Nilsen (2004) (cf. Baker (1970)), is at the heart of positive polarity; if an item has this presupposition, it is a positive polarity item and it cannot scope under negation. Items may move above negation or above the point in the structure where event variables are existentially closed. The implicature introduced at the implicature layer is what I call a partitive implicature. To appreciate what this implicature is, consider the contrast between *unos* and *algunos* in (25) (from Martí (2008)):

(25) a. *Algunos* alumnos míos de Historia llegaron tarde a clase.

b. *Unos* alumnos míos de Historia llegaron tarde a clase.

'*Algunos*/*Unos* history students of mine arrived late for class.'

[10] An example of an event distribution reading is as follows. Consider (2a) again. In the event distribution reading of this sentence, the children get lost in the forest one by one, not as a group. There are different events of getting lost, one per child.

[11] The shape of indefinites in language after language suggests that we want to pursue such an approach: it is very easy to find languages whose indefinites are decomposable into smaller parts. See Haspelmath (1997).

(25b) makes no claim as to whether there were other history students of mine who arrived late for class. Either way could be the case, according to (25b). Hence, I claim, *unos* does not induce a partitive implicature. (25a), on the other hand, implicates there were other history students of mine who were on time. Martí (2008) shows that this meaning component of *algunos*, absent with *unos* (and with bare plurals), behaves like an implicature.

Bare plurals in either language spell out just the plural noun part at the bottom of the hierarchy. This means that bare plurals cannot make use of any of the tools that are introduced higher in the hierarchy. For example, bare plurals cannot contain a presupposition layer in their structure; thus, bare plurals in either language are not positive polarity items. *Uns* and *unos* include this presuppositional level, which also introduces existential quantification. Thus, reaching this level automatically makes the item a positive polarity item and an existential quantifier.[12] One of the consequences of adopting the hierarchy is that, if an item spells out up to a particular level, that item must also spell out lower levels of the hierarchy. In the case of *uns* and *unos*, this means that they must also be semantically plural, since the plurality layer is below the existential quantification and presupposition layer. And they are.[13]

Whether an indefinite also spells out the movement above negation layer is correlated with whether it is capable of escaping the harmful effects on negation (recall that spelling out the presupposition layer entails that the item in question is a positive polarity item). Because *alguns* and *algunos* spell out the entire hierarchy, they also spell out this layer and this entails, correctly, that they obligatorily scope above negation (the narrow scope reading is ruled out because they are positive polarity items). Because they also spell out the movement above ∃e layer, they can give rise to event distribution readings, which, I assume, can come about by scoping above the point in the structure where existential binding of event variables occurs.[14] Of course, *algunos* and *alguns* are semantically plural. And so on.[15]

For the sake of completeness, here are the lexical entries I propose for these items (abstracting away from positive polarity, which is added as a

[12] This is not to say that bare plurals in either language do not have existential import. They do, but this comes about via existential closure, not by becoming an existential quantifier.

[13] Whether bare plurals in either language are semantically plural or not is proposed to be an idiosyncratic property of the nouns themselves, not to be derived from the hierarchy.

[14] Though this is not the only way these readings can come about; the fact that Spanish bare plurals are semantically singular is blamed for the fact that they seem to give rise to event distribution readings; for details, see Martí (2008).

[15] See Martí (2008) for the fully fledged discussion of how the facts in (20)–(23) are accounted for. My purpose in the text is to give an idea of how the hierarchy works more than to indicate exactly how all of these properties follow from it.

presupposition in (26) and hence (28)) ('Mol' stands for 'molecular/plural individual'):

(26) $[\![\textbf{unos}]\!] = \lambda P_{<et>}.\lambda Q_{<et>}.\exists x[Mol(x) \,\&\, P(x) \,\&\, Q(x)]$

(27) $[\![\textbf{alg-}]\!] = \lambda R_{<et,<et,t>>}.\lambda P_{<et>}.\lambda Q_{<et>}.R(P)(Q)$
Implicature: $R(P)(\{x: Q(x) = \phi\})$

(28) $[\![\textbf{algunos}]\!] = \lambda P_{<et>}.\lambda Q_{<et>}.\ [\![\textbf{unos}]\!](P)(Q)$
Implicature: $[\![\textbf{unos}]\!]\ (P)(\{x: Q(x) = \phi\})$
$= \lambda P_{<et>}.\lambda Q_{<et>}.\exists x[Mol(x) \,\&\, P(x) \,\&\, Q(x)]$
Implicature: $\exists x[Mol(x) \,\&\, P(x) \,\&\, Q(x) = \phi]$

Unos spells out up to the movement above negation layer. *Alg-* spells out the implicature and movement above *∃e* layers. Thus, *algunos* spells out the entire structure down to plurality. In both cases, the plural noun spells out the noun layer. And bare plurals also spell out just this noun layer.

An important feature of this kind of approach, one that makes it particuularly attractive, is that it makes sense of the fact that *un(o)s* is on the surface one of the building blocks of *algun(o)s*: in this analysis that is not only a morphological (or morpho-syntactic) fact but a semantic fact. Bare plurals are interesting from this perspective because they are the next step down: if you remove *unos*, you have the bare plural left, and the properties of the bigger NP are a superset of the properties of the smaller NP.

5.3.2 *Building context dependence into the indefiniteness hierarchy*

It is easy to build the context dependence of *algunos* into this system. We add an additional layer to the hierarchy in (24), call it the context dependence layer, and we say that *alg-* also spells out this layer. One way of doing just this is to modify the entry for *alg-* as in (29):

(29) $[\![\textbf{alg-}]\!] = \lambda R_{<<et,<et,t>>,<et,<et,t>>>}\ \lambda P_{<et>}.\lambda Q_{<et>}.R(P\cap C)(Q)$
Implicature: $R(P\cap C)(\{x: Q(x) = \phi\})$

'C' is a contextual variable of the kind commonly assumed to occur with quantifiers such as English *every* (see Fintel (1994), Martí (2003), among many others). It is a pronoun-like element that needs to fix its reference. It picks a contextually salient set of individuals as its referent. In the case of, for example, (2a), that would be the set of individuals who are children and are in Teachers A and B's care.[16] Since *unos* does not spell out the context dependence layer, its lexical entry does not manipulate a contextual variable and hence it is not context-dependent.

[16] I make the implicature sensitive to this contextual variable as well because in an example like (2a), the idea is that there are some children of those that are in Teachers A and B's care who didn't get lost in the forest.

5.3.3 *Where is context dependence located in the hierarchy?*

There are two main options for the location of context dependence: either at the very top of the hierarchy, or somewhere below that and above the movement above negation layer. Consideration of the Spanish facts doesn't allow us to go further than this. But if we look at whether Brazilian Portuguese *alguns* is context-dependent, we can do more: since it turns out not to be context-dependent, but it is otherwise just like *algunos*, it must be that the context dependence layer is at the top of the structure in (24).[17] *Alg-* in Brazilian Portuguese spells out up to just below the context dependence layer; *alg-* in Spanish includes the context dependence layer.

Let us look at the Brazilian Portuguese data. The examples here are parallel to those from section 5.2:

(30) {Teachers A and B are on an excursion with a group of children, of whom they are in charge. Teacher A comes running to teacher B:}

a. Teacher A: Você ouviu? *Algumas crianças* se perderam
you heard children clitic lost
na floresta.
in-the forest

b. Teacher A: Você ouviu? *Umas crianças* se perderam na floresta.
'Have you heard? *Algumas*/*umas* children got lost in the forest.'

(3) {After a few hours, teachers A and B discover that none of the children from their group had actually got lost; it was children from a neighbouring village:}
Teacher A: We are so fortunate that what I said turned out to be false – we don't have to give bad news to any parent!

(4) Teacher A: But at least all of our kids are back.

(30a) cannot be followed by (the Brazilian Portuguese equivalent of) (3), repeated here. The new developments in (3) do not make the statement in (30a) false: that statement says that some children (contextually salient or not) got lost in the forest and some other children didn't. On the other hand, (30a) can be followed by (the Brazilian Portuguese equivalent of) (4), also repeated here: the statement that all of the teachers' children are back is compatible with some other group of children having got lost in the forest.[18]

[17] European Portuguese *alguns* behaves just like Spanish *algunos*.

[18] Some speakers might need stress on *nossas* 'our' in the Brazilian Portuguese version of (4):

(i) Mas pelo menos todas as NOSSAS crianças estão de volta.
'But at least all of our children are back.'

Stress doesn't improve things for (4) when used as a continuation for (2a) (the Spanish version of (30a)).

(31) and (32) are the Brazilian Portuguese versions of (8) and (9), respectively:

(31) {A and B are mathematicians at the university in Saarbrücken. A comes running to B. Children are something that hasn't been on their minds or conversations for a long time:}

a. A: Você sabia que *alguns* meninos conseguiram resolver o
you know that children managed solve the
desafio de Poincaré?
conjecture of Poincaré?

b. A: Você sabia que *uns* meninos conseguiram resolver o desafio de Poincaré?
'Did you know that some children have managed to solve Poincaré's conjecture!'

(32) {A and B work at an agency for the prevention of car accidents. A is already at work, and B is just now arriving, and he is quite agitated. Children are something that hasn't been on their minds or conversations for a long time:}

a. B: Santo Deus! *Alguns* meninos estão brincando perto
holy God children are jumping close
demais da estrada!
too of-the road

b. B: Santo Deus! *Uns* meninos estão brincando perto demais da estrada!
'Oh my God! Some children are jumping too close to the road!'

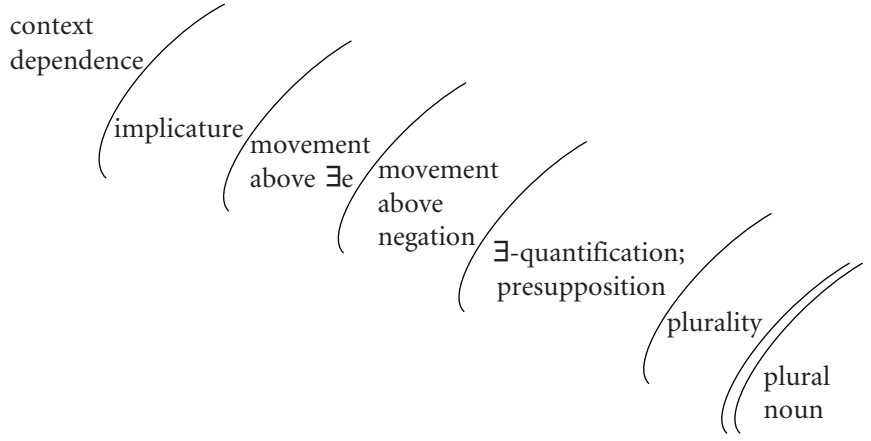
Recall that these contexts provide no set of children that can serve as referent for an ensuing pronominal item. In contrast with Spanish *algunos*, *alguns* (and *uns*, of course) is felicitous in such contexts.

Brazilian Portuguese *alguns* behaves in every other respect just like Spanish *algunos* (see Martí (2008)). Thus, *alguns* is ideal in that it allows us to see where in the indefiniteness hierarchy context dependence should be located. If context dependence is located at the top of the hierarchy, then we can understand this minimal difference between *alguns* and *algunos*: whereas *algunos* spells out the entire hierarchy, *alguns* spells out everything up to the context dependence layer. Locating context dependence anywhere lower than that would not allow us to explain the behaviour of *alguns*: since it induces a partitive implicature, it

would have to spell up to at least the implicature layer, but that would include the context dependence layer too.[19]

The proposal, then, is to modify (24) as in (33):

(33)



The lexical entry for Brazilian Portuguese *alg-* is in (34); the one for Spanish *alg-* is repeated here for convenience:

(34) $[\![\textbf{alg-}]\!] = \lambda R.\lambda P_{<et>}.\lambda Q_{<et>}.R(P)(Q)$ (Brazilian Portuguese)

Implicature: $R(P)(\{x: Q(x) = 0\})$

(29) $[\![\textbf{alg-}]\!] = \lambda R.\lambda P_{<et>}.\lambda Q_{<et>}.R(P \cap C)(Q)$ (Spanish)

Implicature: $R(P \cap C)(\{x: Q(x) = 0\})$

5.3.4 *Summary*

In this section I have shown that a straightforward extension of the indefiniteness hierarchy in Martí (2008) allows us to account for the behaviour of *algunos* and to explain why *unos* is different: *algunos* is context-dependent because it spells out the context-dependence layer in the hierarchy; *unos* is not because it doesn't spell out that layer of the hierarchy. We know what it would take for *unos* to be context-dependent: it would also have to be able to move above *∃e*, the point at which event variables are existentially closed; that is, it would have to give rise to event distribution readings. Consideration

[19] Matthewson (this volume) could provide us with another reason for building context sensitivity at the top of the hierarchy: St'át'imcets *nukw* induces a partitive implicature (it means something like 'some of') and it is context-sensitive. This would indicate that *nukw* spells out the top two layers of the hierarchy and is quite similar to Spanish *alg-*.

of the Brazilian Portuguese data allowed us to know about the indefiniteness hierarchy, since we were able to conclude that the context dependence layer occurs at the very top of the structure.

Interesting questions remain to be answered about the indefiniteness hierarchy. How cross-linguistically valid is it? Can it explain the properties of all indefinites, including those that are formed in many languages on the basis of interrogative words? If not, what has to be added or modified? Answering these questions is of course outside the scope of this chapter. But data like those presented in this chapter can help us elucidate further aspects of the hierarchy and ultimately determine how valid it is in the explanation of the behaviour of indefinites in different languages.

5.4 Consequences for domain restriction

The discussion in the previous sections suggests that indefinite contextual restriction can be overt, at least in some languages. The chapter thus contributes to the programme in Etxeberria (2005), Etxeberria (this volume), Giannakidou (2004), Etxeberria & Giannakidou (2008a) and Matthewson (2001). Quantificational domain restriction can be effected overtly: domain restriction can be overt with existential quantifiers as well as with 'strong' quantifiers, and the definite determiner is not always what is used to achieve domain restriction.

Etxeberria (2005), Etxeberria (this volume), Giannakidou (2004), Etxeberria & Giannakidou (2008a), Martí (2003), and Stanley (2002) discuss the issue of where inside the quantificational noun phrase domain restriction is located. If I am right in treating Spanish *alg-* as introducing context dependence, then we have an argument that the grammar must make it possible for context dependence to reside on the quantifier. Furthermore, in a language like Spanish, it cannot be the case that context dependence ever resides covertly in the noun, for otherwise *unos* NPs would be predicted to behave in exactly the same way as *algunos* NPs: this behaviour would be the responsibility of *alg-* in the case of *algunos* NPs, and the responsibility of the noun in the case of *unos* NPs. A similar consequence ensues for Brazilian Portuguese: context dependence cannot reside in nouns in this language, for otherwise both *alguns* and *uns* would be predicted to be context-dependent, contrary to fact.

This, of course, does not close the door to the possibility that in other languages the context dependence of quantificational phrases comes from nouns, or from both quantifiers and nouns. Let us examine some of the recent claims that have been made about the location of context dependence inside quantificational phrases. Matthewson (2001) suggests, on the basis of

data from St'át'imcets (Lillooet Salish), that, universally, domain restriction is introduced by a determiner that combines with nouns, i.e. that, in all languages, domain restriction is located on nouns. (35) shows some of the crucial data from St'át'imcets; the discontinuous determiner *i . . . a* (*ti . . . a* in the singular) is obligatory throughout ('det' stands for 'determiner'; 'pl' for 'plural'):

(35) *St'át'imcets*

a. tákem **i** smelhmúlhats-**a**
all det.pl woman(pl.)-det
'all the women'

b. zí7zeg' **i** sk'wemk'úk'wm'it-**a**
each det.pl child(pl.)-det
'each of the children'

The claim is that the determiner *i . . . a* introduces domain restriction in addition to producing an argument of type <e> for the quantifiers *tákem* 'all' and *zí7zeg'* 'each'. Matthewson (2001: 159) claims that 'St'át'imcets provides us with overt evidence about the nature and the position of the domain restriction of quantifiers', that is, domain restriction is effected on the noun, a position that Stanley (2002) has also adhered to (see Cheng (this volume), for an argument that Chinese *dou* introduces domain restriction and is also a definite determiner). The data considered in the present chapter show three things. First, domain restriction and the definite determiner are not necessarily related, since Spanish *alg-* is not a definite determiner and yet it introduces context dependence. Second, and perhaps more importantly, we must allow domain restriction to be located with the quantifier in order to explain the properties of *algunos*. And, third, and also quite importantly, in languages like Spanish and Brazilian Portuguese, (covert or overt) nominal restriction (exemplified overtly by St'át'imcets in (35)) must be disallowed, since otherwise we make the wrong predictions for *un(o)s* and *alguns*. The issue here is not only the question of how to reconcile Spanish/Brazilian Portuguese and St'át'imcets but, more generally, what the right approach is to the variation we find in the different languages, and within particular languages. The data discussed in this chapter pose a challenge for Matthewson's (Matthewson (2001), sections 3 and 7) no-variation hypothesis that 'there are certain fundamental semantic structures or properties which all languages should share' (p. 156), one of those structures or properties being nominal domain restriction.

Giannakidou (2004) has also recently challenged the conclusions in Matthewson (2001). She takes the definite determiner to introduce domain

restriction, like Matthewson, but argues, on the basis of Greek data, that both the St'át'imcets option in (35) and the Greek option in (36) must be allowed:

(36) *Greek*

a. **o** kathe fititis
det.masc.sg every student
'each student'

b. *kathe fititis, *kathe **o** fititis

As Giannakidou reminds us, it seems necessary to say that even in St'át'imcets, domain restriction can be located on quantifiers, as the following data suggest:

(37) *St'át'imcets*

a. **i** tákem-**a** smúlhats
det.pl all-det woman
'all the women' (see Matthewson (2001: 151, footnote 5))

b. **i** kalhélhs-**a** míxalh
det.pl three.det bear
'three bears' (Matthewson (1999: 96, her (29)))

Etxeberria (2005), Etxeberria (this volume) shows that the quantifier option must be allowed for Basque as well:

(38) *Basque*

a. mutil guzti-**a**k
boy all-det.pl
'all the boys'

b. *mutil guzti, *mutil-**a**k guzti

c. ume bakoitz-**a**k
child each-det.pl
'each child'

d. *ume bakoitz, *ume-**a**k bakoitz

Basque seems to make a distinction between 'strong' and 'weak' quantifiers, since with the latter, it is the nominal option that is chosen:[20]

[20] Etxeberria claims that weak quantifiers in their 'cardinal' (non-proportional) reading are incompatible with the definite article and hence with domain restriction. That is, in (i), only cardinal interpretations are possible; in (39), only proportional interpretations are possible:

(i) *Basque*
a. zenbait politikari
some politician
'some politician(s)'

(39) *Basque*

a. ikasle-**etatik** zenbait
student-det.pl some
'some students'

b. *ikasle zenbait-**ak**/-**etatik**

c. ikasle-**etatik** asko
student-det.pl many
'many students'

d. *ikasle asko-**ak**/-**etatik**

To sum up, in the formulation of a parameter that would tell us why the different languages make the choices that they make, then, it must be the case that (i) domain restriction is allowed on quantifiers (perhaps across the board) (Greek, Basque 'strong' determiners, *algunos*, St'át'imcets), (ii) domain restriction on the noun is allowed in some languages but not in others (yes in Basque and St'át'imcets, no in Spanish or Brazilian Portuguese). Notice that these consequences are independent of the particular way we choose to model context dependence (with or without a variable, with the variable in the syntax or not, etc.).

The idea that domain restriction is tied to the definite article raises the question of what the right analysis of *algunos de los* 'some of the' is. *Algunos* can be combined with *of the*, and in the works cited above this would be taken as an indication that (a) *algunos* by itself is not domain restricted, and (b) *los* effects (nominal) domain restriction. This analysis would seem to be supported by the fact that *algunos de los* behaves like Greek and Basque 'strong' quantifiers – in terms of presuppositionality and veridicality, impossibility to appear in existential constructions or to participate in generic statements, etc. We have seen evidence above, however, that (a) is not correct. Now I want to briefly look at the behaviour of *algunos de los* and ask whether (b) is the case. Note that, if (b) is true, then there would be two contextually sensitive

b. *zenbait-**a**-k politikari

c. politikari asko
politician many
'many politicians'

d. *politikari asko-**a**-k

Etxeberria takes the fact that the Basque definite article, *-a-*, is absent with weak quantifiers in their cardinal reading to be an indication that the hallmark of these readings is lack of domain restriction. The behaviour of *algunos* described in this chapter would seem to suggest that this cannot be true: no matter what the reading, *algunos* is always accompanied by domain restriction (i.e. *algunos* is always accompanied by *alg-*). Cardinal readings, it would seem, can be readings derived from LFs that contain contextual variables. Further research is needed to clarify this issue.

items in *algunos de los*. This is relevant because both Giannakidou (2004) and Etxeberria (Etxeberria (2005), Etxeberria (this volume)) ban 'double' domain restriction.

Algunos de los is interpreted as relating to an existing discourse referent. We can see this by observing the effect that using *algunos de los* has in an example like (40):

(40) {Teachers A and B are on an excursion with a group of children, of whom they are in charge. Teacher A comes running to teacher B}
Teacher A: ¿Te has enterado? *Algunos de los* niños se han perdido en el bosque.
'Have you heard? Some of the children have got lost in the forest.'

(40) can be followed by the Spanish version of (3), repeated here, and it cannot be followed by the Spanish version of (4), also repeated here:

(3) {After a few hours, teachers A and B discover that none of the children from their group had actually got lost; it was children from a neighbouring village:}
Teacher A: We are so fortunate that what I said turned out to be false – we don't have to give bad news to any parent!

(4) Teacher A: But at least all of our kids are back.

This indicates that *algunos de los* must refer back to a previously introduced entity.

Algunos de los, as opposed to *algunos*, cannot appear in the existential construction:

(41) a. *Hay *algunos de los* libros sobre la mesa.
'There are some of the books on the table.'

b. *Había *algunos de los* chavales demasiado cerca de la carretera.
'There were some of the boys too close to the road.'

c. *Hay *algunos de los* países que podrían desaparecer si no se les presta ayuda para combatir la enfermedad.
'There are some of the countries that could disappear if they don't receive help to fight the disease.'

An obvious candidate to blame for the behaviour of *algunos de los* in (41) is *los*, the definite article. There is evidence that *los* in *algunos de los* introduces the presupposition that the set denoted by the head noun is non-empty. Consider (42) and (43) and compare them with (18) and (19), respectively:

(42) Question asked by reader in online interview: In which areas of the world is the AIDS problem the worst?

Answer by doctor: In Sub-Saharan Africa, doubtlessly . . .
Algunos de los gobiernos con los recursos necesarios se están preparando para prestar ayuda. #De hecho, no existen gobiernos con los recursos necesarios (en el África Sub-Sahariana).
'Some of the governments with the necessary resources are getting ready to help. In fact, there exist no governments with enough resources (in Sub-Saharan Africa).'

(43) Question asked by reader in online interview: In which areas of the world is the AIDS problem the worst?

Answer by doctor: In Sub-Saharan Africa, doubtlessly. Our attempts at containment in this area have so far failed, and . . .
los políticos de los países ricos se están preguntando si *algunos de los* gobiernos con los recursos necesarios estarían preparados para prestar ayuda. #No están seguros de que existan gobiernos con tales recursos (en el África Subsahariana).
'Policitians in rich countries are wondering whether some of the governments with the necessary resources would be prepared to help. They are not sure there exist governments with such resources (in Sub-Saharan Africa).'

Algunos de los presupposes that the set denoted by the head noun is non-empty (the presupposition comes in two flavours, depending on whether context dependence is taken into account or not). This, as we have seen in section 5.2.2, is different with *algunos*. Following Zucchi (1995) and others, we can say that there is an incompatibility between this presupposition and the existential construction, whichever way we may want to actually formulate the incompatibility. Note that (44) is out:

(44) *Hay los libros sobre la mesa.
'There are the books on the table.'

According to this analysis, then, *algunos de los* introduces a presupposition that is lacking in *algunos* and that is blamed on *los* on the basis of independent evidence.

That *los* has this role to play does not, of course, mean that it doesn't also effect context dependence. There is independent evidence that it indeed introduces context dependence as well, just like, for example, English *the*:

(45) *Los* alumnos suspendieron el examen.
the students failed the exam
'The students failed the exam.'

The sentence in (45), just like its English counterpart, is not interpreted as a statement about the biggest set of students there is (that is, the whole set of such individuals), but as a statement about a particular subset thereof, the subset of students that is relevant or salient in the context in which (45) occurs.

We have evidence, then, that *algunos de los* induces presuppositions that are lacking in *algunos* and also that *los* itself introduces context dependence. Since both *alg-* and *los* introduce context dependence, there is double context dependence in *algunos de los* and such an option must be allowed by the grammar, contra Giannakidou and Etxeberria.[21] Another conclusion we can draw from these considerations is that, in order to distinguish *unos* from *algunos*, we need to ban covert, not overt, nominal restriction. Overt nominal restriction, as in *algunos de los*, seems to be fine.

5.5 Data collection

This chapter is based on a pilot study run with two native speakers of Iberian Spanish (both of them from the Madrid area, one of them the author) and two native speakers of Portuguese (one of Brazilian Portuguese, the other of European Portuguese). There is a more comprehensive and better experiment in preparation that will test the judgements presented here with more native speakers and with more developed questionnaires.

The questionnaire used in the pilot study elicited judgements about truth conditions or about contextual appropriateness, the most commonly used ways to probe semantic intuitions. In the items in the questionnaire, a context is first described to the speaker, after which the test sentence (known independently to be grammatical) is provided, and the subject is asked to judge whether the sentence is true in the given context or an appropriate description of the events in this context. Other times, certain questions about the contribution of the sentences are asked. For example, in (6), repeated here,

[21] As Anastasia Giannakidou correctly points out, if it turns out that domain restriction on *algunos* is of a different kind from domain restriction on definites and strong quantifiers (recall footnote 7), then it might be that the ban on double domain restriction is a ban on two (or more) occurrences of the *same kind* of domain restriction.

speakers were asked whether the boys that were too close to the road were also fighting or not:

(6) Upon arriving at the school and seeing several groups of boys fighting, the principal, sick and tired of seeing the same scene every day, mumbled to himself: 'What a way to begin the day!'. In a panic, he realized that . . .

a. . . . había *unos chavales* demasiado cerca de la carretera.

b. . . . había *algunos chavales* demasiado cerca de la carretera.
'. . . there were some boys that were too close to the road.'

For more remarks on methodology see, for example, Beck (2005), Matthewson (1999), Matthewson (2001), Matthewson (2004), and Martí (2003).

5.6 Conclusion

It has long been recognized that quantificational expressions in natural language are context-sensitive, but the attention has generally focused on so-called 'strong' quantifiers like English *every*. In this chapter I have looked instead at the context sensitivity of indefinite quantifiers. Spanish is a good language to look at because, if I am right, it has two kinds of morphologically related indefinites: a context-dependent one, *algunos*, and a context-independent one, *unos*.

Having argued for a treatment of *algunos* in which *alg-* introduces context dependence, I turned to consider the consequences of this proposal for our views on domain restriction and quantification. The chapter contributes in important ways to the overt restriction programme initiated by Etxeberria (2005), Etxeberria (this volume), Etxeberria & Giannakidou (2008a), Giannakidou (2004), and Matthewson (2001), since it opens the possibility that existential/'weak'/indefinite quantifiers can also bear an overt mark of domain restriction. The analysis of the Spanish (and Brazilian Portuguese) data seems to suggest that Matthewson (2001)'s approach to cross-linguistic quantification, based on the structure of quantificational phrases in St'át'imcets, cannot be right. *Algunos* shows that the grammar must allow domain restriction to be a property of quantifiers, and *un(o)s* and *alguns* show that the grammar must make it possible for a language to ban nominal domain restriction. I suggested above that we need to revisit the debate about the cross-linguistic nature of quantification and domain restriction in the light of these data.

What exactly the principles or universal properties are that are involved in domain restriction, as well as exactly what the parameters are, remain open questions. One aspect of the case presented here that needs further consideration is the fact that *algunos* has unrestricted as well as restricted uses, and what

this means for our ideas about domain restriction – perhaps, as suggested by Anastasia Giannakidou, domain restriction is different in 'strong' vs. 'weak' quantifiers. Another important issue is what relation holds between domain restriction and other properties (e.g. presuppositionality, specificity[22]). These are issues that can only be solved by deepening our understanding of quantification in the languages discussed here as well as in other languages, an enterprise that this chapter, like many of the other works discussed in it, has aimed at contributing to.

[22] Anastasia Giannakidou points out that Greek *kapjos* and *kati* seem to be different from each other in ways similar to *algunos* and *unos* but that *kapjos* is a specific indefinite. This raises the possibility that *algunos* is also a specific indefinite, instead of or in addition to being domain-restricted. I leave this hypothesis for later consideration.

6

Issues in quantification and DP/QP structure in Korean and Japanese*

KOOK-HEE GIL AND GEORGE TSOULAS

6.1 Introduction

We have witnessed in recent years a blossoming of work on quantification and its consequences for the structure and interpretation of the DP. This kind of work, often based on lesser known or less well studied languages, is now taking shape and is becoming a major influence on the current thinking not only on the structure of the DP and QP but also on the proper analysis of the structural and semantic configurations underlying quantification.[1]

In the present chapter our goal is to combine several lines of research regarding the structure and interpretation of the DP/QP, which have been recently pursued, often quite independently. Empirically, our main concern here will be with languages such as Japanese and Korean and we will essentially focus on the following three basic and interconnected issues:

(1) a. The structure of nominal phrases with special reference to the syntax of classifiers.

b. The proper treatment of indeterminate-based quantification.

c. The issue of the basic denotation of Ns in those (and other similar) languages.

* We are very much indebted to the editors of this volume for the invitation to present this work and for their extreme patience down to the last minute with our delays in getting the final manuscript in. There is nothing more that we could have expected. Anastasia Giannakidou commented extensively on the first draft and we thank her for her penetrating and extremely helpful comments (we should be writing another chapter to take into account all the points she raised). We are also indebted to the audience at the Saarbrucken conference for their comments and especially to Hagit Borer, Angelika Kratzer, and Manfred Krifka. We would also like to thank Gennaro Chierchia for discussion on the NMP and other issues related to the work reported here.

[1] The other chapters in this volume testify to this statement better than we could express it here.

Our basic argument here will be that the apparent structural poverty that these languages display is indeed, to an important extent, an accurate reflection of the actual structures involved in the N/D projection and in quantification. Secondly, we will argue for a more universal character reassignment of the roles of those functional heads that are more often thought of as DP-internal to elements belonging to the functional field above vP. In this way we also draw on a separate strand of research dealing with the nature and content of the functional field(s) that dominate major cyclic (phasal) nodes.

The specific perspective that we have chosen in order to approach the phenomena in question, though by no means unique, is particularly well suited, we believe, to bring to the fore issues that are particularly important to us that have not always been considered in conjunction in this manner, and which shed some light on issues that are generally important to the concerns of the present volume as a whole.

The chapter is structured as follows: section 6.2 provides the general background against which the problematic facts investigated here can be appreciated, namely the *nominal mapping parameter*, and indeterminate-based quantification. Section 6.3 spells out the problem and section 6.4 discusses and offers a critique of some existing approaches to the general issues discussed here. Section 6.5 concentrates on the need for an elaborate structure for the Korean and Japanese DP. Section 6.6 outlines an alternative analysis and shows how the problematic facts are accounted for within a slightly different set of assumptions and, finally, section 6.7 concludes the chapter.

6.2 Setting the stage

Let us begin by gathering some of the basic principles and ancillary assumptions that will serve as the basic ingredients from which the paradox that forms the core of our investigation will emerge. Let's begin with the issue of the basic or lexical denotations of nouns in Korean and Japanese. Several proposals in current research have converged on the idea that the lexical denotations of nouns in languages such as Japanese and Korean most resemble those of mass nouns in English. This statement, empirically, entails (at least) that these languages will lack plural (and perhaps number in general) morphology and that they will have a generalized classifier system.[2]

In order to see more concretely what the conceptual properties of this idea amount to and their consequences for the grammar of DP/QP, we will start

[2] Other properties too may be connected directly or indirectly to this idea. They are, however, generally dependent on the particular implementation of the proposal and as a result we can safely leave them aside for now.

by presenting a specific version of the proposal, namely the one in Chierchia (Chierchia (1998b), Chierchia (1998a), Chierchia (2003)). This proposal is based on the so-called *nominal mapping parameter* (NMP, henceforth), which we present in the next section. The NMP will provide a background to the chapter. The second background issue concerns the basic processes at work in the formation of quantifiers in Japanese and Korean, namely the use of so-called *indeterminate pronouns*.

6.2.1 *The nominal mapping parameter*

In a series of works, Chierchia has developed and defended the idea that parameterization concerns not only morpho-syntactic properties, encoded in functional heads, but also semantic ones. Specifically, he has formulated a semantic parameter concerning, at its root, the denotation of nominal categories in various languages (Chierchia (1998b), Chierchia (1998a), Chierchia (2003)).[3] The parameter, however, is stated in terms of its overt reflexes, and thus manages to bypass important issues of learnability. In other words, the child will only set the parameter to one of its premissible settings (see (3)) if she comes across positive evidence such as the lack of plural morphology, the use of bare nominals in argument positions, and a generalized classifier system.

The parameter is stated in terms of the combination of two Boolean features (2):

(2) a. [± arg]
b. [± pred]

Each of the value combinations in (3) is a possible setting of the parameter. These settings reflect whether within a given grammatical system nominal expressions can be used bare in argument ([± arg]) or predicate ([± pred]) positions. Individual languages may instantiate any of the following sets of values:

(3) a. [+arg, −pred]
b. [−arg, +pred]
c. [+pred, +arg][4]

[3] See also Gillon (1987), Gillon (1992) for some antecedents.

[4] The fourth logical possibility, i.e. [−arg, −pred] is excluded since such a language could not use its nouns . . . ever! This sounds like a good *prima facie* reason to exclude this value from the possible settings of the parameter. It is, however, not a logical necessity. We will return to this point briefly at the end of the chapter.

We focus in this chapter on languages that are of type (3a). In languages of this type, nouns are used bare in argument positions, in *all* argument positions. The following Korean example illustrates this point:

(4) Gay-ga koyangi-lul cchocassta.
dog-NOM cat-acc chased
'(A) dog chased (a) cat.'

Chierchia's proposal here is that bare nouns in argument positions denote kinds – much like Carlson (1977a) has proposed for bare plurals in English. In the case of Japanese and Korean, though, in the context of the NMP, the proposal is that nouns are supposed to refer – lexically – to kinds, and they have to be converted (type-shifted) to properties in order to take part in quantification, counting, etc. One of the implications of this kind-to-property mapping is that nominal predicates have a mass denotation. This is so because the '$^{\cup}$' operator used to map kinds to properties is an ideal-forming operator. Furthermore, Chierchia proposes a particular view of the semantics of mass terms, which we briefly present in the next section.

6.2.2 *Mass terms and the domain of quantification*

Chierchia's view of mass terms involves, at its basis, the idea that both mass and count nouns take their denotations in the same domain of quantification.[5] The proposal is that the domain of quantification is structured as a complete atomic join semilattice, visualized as follows:

(5) a.
{a, b, c} …
{a, b} {a, c} {a, b} …
a b c …

b. i. $\{a, b\} \leq \{a, b, c\}$

ii. $a \leq \{a, b\}$

Under this view, the bottom row represents the singularities and the higher sets thereof, i.e. the pluralities. Thus, the domain of quantification includes both the denotata of singulars and plurals. Now, it is important to note that under this conception the extension of a mass term will look like (6):

(6) $\begin{bmatrix} \{a, b, c\} & & \\ \{a, b\}, & \{a, c\} & \{c, b\} \\ a & b & c \end{bmatrix}$

[5] This is unlike proposals such as Link (1983) and others in the same tradition.

In other words, it will be a sublattice of the domain; it will have the same structure as the domain as a whole and this is precisely what differentiates it from the denotata of singulars or count plurals, which are both *subsets* of the domain. The prediction of this approach for languages like Korean and Japanese is that their nouns when used bare will refer to kinds, but when, for whatever reason, a property denoting expression is required, then their denotation will be as in (6). There are several consequences to this, some of which we have already alluded to, such as the fact that languages of this type have highly developed and generalized classifier systems and lack plural inflection. We will return to these issues soon. More problematic, it seems to us, is the case of quantification involving indeterminate pronouns, which is pervasive in these languages. We will now present the basics of this type of quantification before returning to the problem that the approach based on the nominal mapping parameter raises for quantificational structures in these languages.

6.2.3 *Indeterminates and quantifiers in Korean and Japanese*

Indeterminate pronouns are routinely used in order to form quantifiers in languages like Japanese and Korean. Depending somewhat on one's definition of the notion of an indeterminate pronoun, the set of languages using them as a basic strategy shrinks or expands. That Japanese and Korean will be part of this set is, however, undeniable. We will call the process of forming quantifiers using indeterminate pronouns *indeterminate-based quantification* and by this term we will understand the process whereby an indeterminate pronoun such as Korean *nwukwu* (who/one) or Japanese *dare* (who/one) associates either locally or in certain cases at a distance with an operator-like element to form a quantificational expression.[6] A simple case of this process is exemplified by the Japanese examples in (7) and (8):[7]

(7) Haruko-wa dare-ka-ni tegami-o okutta.
Haruko-TOP who-DISJ-DAT invitation-ACC sent
'Haruko sent an invitation to someone.'

[6] See among many others Nishigauchi (1990), Shimoyama (2001).

[7] A reviewer has pointed out that it is not obvious that elements like *nani-mo* are indeed universal due to the presence of negation. A positive example would indeed make the point more clearly and forcefully. Unfortunately, a positive example including something like *nani-mo* is impossible to construct in Japanese (or in Korean for that matter) since items composed of indeterminate pronouns and conjunction markers cannot be licensed in the absence of negation. Remarkably, this is true of all languages that we know of that employ indeterminate-based quantification. For more details on the analysis of these elements see Gil & Tsoulas (2006). See also Giannakidou (2000) for proposals in the same spirit based on different data.

(8) Taka-wa nani-mo yoku tabe-na-katta.
Taka-TOP what-CONJ well eat-NEG-PAST
'Taka ate nothing well.'

In (7) and (8) the indeterminate pronouns *dare* and *nani* combine with the operators *ka* and *mo* and receive as a result existential and universal force respectively. Interestingly, the particles *mo* and *ka* function also independently as conjunction and disjunction morphemes (9), (10):

(9) John-wa Mary-ga kita-to-mo Bill-ga inakunatta-to-mo itta.
John-TOP Mary-NOM came-CONJ Bill-NOM disappear-CONJ said
'John said that Mary came and Bill disappeared.'

(10) John-wa eigo ka nihongo-wo hanasenai.
John-TOP English DISJ Japanese-ACC speak-able-NEG
'John cannot speak English or Japanese.'

Schematically, we have:

(11) *Dare/Nani* + $\begin{matrix} \nearrow & mo \rightarrow \forall \\ \searrow & ka \rightarrow \exists \end{matrix}$

(12) *Indeterminate* + *NP* + $\begin{matrix} \nearrow & \wedge \rightarrow \forall \\ \searrow & \vee \rightarrow \exists \end{matrix}$

Note here that this is the general case. There are complications especially in Korean but they are not relevant to the points discussed in this chapter. For a detailed exposition and analysis of the Korean patterns see Gil et al. (2006). This much background will do for our present purposes. Let us now move on to see in what way putting the two pieces together produces a clash.

6.3 The problem

Against the above background, consider the mechanisms that would produce compositionally quantificational meanings in languages of type (3a) specifically in cases of indeterminate-based quantification.[8] Let us make the issue a little more precise. If the indeterminate pronoun (*Indp* henceforth) refers to a kind, as the nominal mapping parameter would have it, then the nature of the quantificational particle[9] must be such that it allows it to combine with a kind-denoting expression. As Chierchia himself points out, under his

[8] As far as we can tell, belonging to type (3a) and having indeterminate-based quantification are logically independent properties. We have not as yet conducted any significant typological survey but it would be interesting if there were any correlation – in whatever direction. We will leave this for a future occasion.

[9] We will return shortly to its proper nature.

view, an immediate problem arises with determiners which naturally look for a restriction in the form of a predicate and, in type (3a) languages, would instead get a kind-referring expression. Chierchia suggests defining a variant of determiner meanings applying to kinds in the following way:

(13) $\mathrm{DET}'(x)(P) = \mathrm{DET}(^{\cup}x)(P)$

Recall now from sections 6.2.1 and 6.2.2 that '$^{\cup}$' assigns x (i.e. the property counterpart of a kind) a mass denotation, which is shown in (6). Note that this is not just some cranky, language-specific property; this is a property of the mapping of kinds to properties in general. Technically speaking, this is true because '$^{\cup}$' is an ideal-forming operator, as we have already noted. But also conceptually, kinds do not differentiate between singularities and pluralities – directly at least – in terms of their instantiation. This leads us to the following: If all the above is correct, then in a language of the [+arg, −pred] type, an expression like:

(14) Every man left.

will be true in an undifferentiated manner of both single men and pluralities thereof. A priori this would be surprising. Notice also that, for this particular kind of example (14), this is not problematic. It is indeed difficult to imagine a case where every individual man left but some groups of the men, who as individuals have in fact left, have somehow remained. However, we clearly have a problem with a sentence like (15) where ownership of ₩4000 is asserted – in the relevant reading – of singularities and not pluralities.

(15) Every man has ₩4000.

It is unclear how in the system as presented so far this distinction is to be made without any further stipulation. Let us also simply point out here that the universal quantifiers produced in the indeterminate + operator system are distributive universals. We will take up this issue later in the chapter. Before that, we will move on to the second part of the puzzle, which now concerns the presence of classifiers in the languages under discussion.

6.3.1 *Type (3a) languages have classifiers*

As we noted earlier, the approach based on the nominal mapping parameter, and its consequence regarding the fact that nouns in type (3a) languages have a basic mass denotation, has many interesting consequences. One of these consequences, which is particularly interesting for present purposes, is the fact that, in these languages, numerals and nouns will not be able to combine directly because, given that the noun is mass, there is no linguistically specified

atom or unit that the numeral would count. Thus, the presence of a classifier will be required in order to specify the atom that forms the basis of the counting. Second, there will be no plural marking in these languages. The latter consequence derives from exactly the same reason that Chierchia offers for the lack of plural marking in languages like English, namely, the fact that, given the structure of the denotation of mass nouns, they already contain the pluralities and, therefore, they are fundamentally, i.e. lexically, *plural* and as a result they cannot be further pluralized.

Now the first of these consequences, the one about classifiers, would be naturally taken to imply that the solution to the problem of the distributive quantification seen in (15) should indeed involve the use of classifiers. Given that the classifiers individuate atoms that are appropriate for counting, we might reasonably suppose that they would be called upon in order to individuate atoms appropriate for distribution and quantification. Therefore, we would expect (15) to be expressed in a type (3a) language as (16):

(16) Every-CL-Man has ₩4000.

Unfortunately, this is an incorrect prediction. As it turns out, in these cases, not only the classifier is not *needed*, it is in fact completely ungrammatical, as (17) from Japanese and (18) from Korean show:

(17) *dono hon-satsu mo
which book-CL Q
'every book'

(18) *etten chayk-kwen to
which book-CL Q
'every book'

What might one conclude from these facts? It seems to us that two avenues are open. First, that languages like Japanese and Korean are indeed *not* of the [+arg, −pred] type proposed by Chierchia (1998a), and indeed Watanabe (2006) concludes just that on the basis of similar arguments; and more or less as a direct result we would reject the nominal mapping parameter altogether. But we are reluctant to jump to such a conclusion immediately since the nominal mapping parameter seems to capture enough cross-linguistic generalizations to warrant having a shot at preserving it or, if preserving it in its totality turns out to be impossible, preserving that part of it which is directly responsible for the correct predictions. Second, and this is our first shot at *having a shot*, we could try to salvage Chierchia's account by appealing to a generalization of his *Derived Kind Predication* (19) as in (20):

(19) Derived Kind Predication
if P applies to objects and k denotes a kind, then
$P(k) = \exists x[^{\cup} k(x) \wedge P(x)]$

(20) If R is an n-place relation and k is a kind, then
$R(k) = \lambda x_1, \ldots, \lambda x_{n-1} \exists y[^{\cup} k(y) \wedge R(y)(x_1) \ldots (x_{n-1})]$

Naturally, in the cases at hand there is no question of introducing an ∃-quantification in that position. Something else might do the work, though; perhaps a distributive operator could be introduced.[10] Whatever the specific mechanism one might end up proposing, conceptually, what is important to retain here is that it stands to reason that these cases are also a subset of the cases where, in Chierchia's terms, '*an automatic local adjustment triggered by a type mismatch*' may be invoked. The challenge, if this route is to be pursued, is to constrain appropriately the contexts in which this local adjustment may take place. Thus, one may have to broaden the possible cases to include mismatches other than type mismatches, as there seems to be none in this particular case. In any event, at this stage this is meant to be only a tentative illustration of the type of strategy one might adopt. We will return to a discussion of this strategy after we have presented and discussed some other approaches to this issue that have been prominent in the literature. This is the topic of the next section.

6.4 Some existing approaches

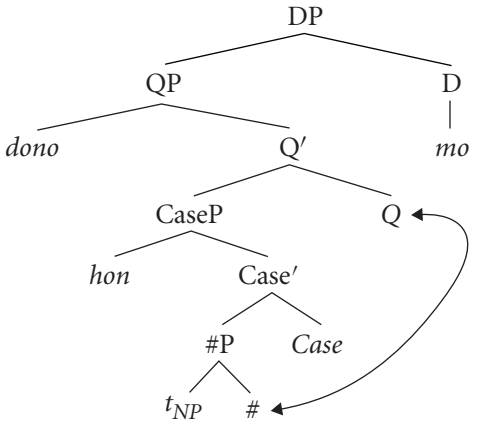
In the previous sections we have presented what in fact is a constellation of issues surrounding the analysis of quantification in languages such as Korean and Japanese. At the end of the previous section we outlined two specific avenues that are open to us in the search for an appropriate solution. We would like to turn now more specifically to the first avenue, i.e. the one that involves a more or less wholesale rejection of the nominal mapping parameter and which attributes the effects it is meant to capture to other, mostly structural, factors.[11] This is the path taken, in slightly different, yet mostly compatible

[10] Note here that we are not suggesting that a distributive operator would be introduced by a last-resort type-changing operation like DKP. This somehow seems wrong. A distributive operator is nowhere near the same status as an existential operator. Rather, our remark is to be taken in the sense that careful analysis may lead us to assume – independently – the existence of such an operator.

[11] It is not always clear whether the authors cited in the text intend to reject the NMP qua parameter (this could be argued on a number of grounds) or simply to argue that the setting postulated for Japanese, Korean, Chinese, etc. is not right. From a narrower and therefore safer perspective, that the intention involves the latter proposition is certain. We will therefore at this stage at least refrain from a more general discussion of the (de)merits of the NMP in general. We will take up the issue briefly at the end of the chapter.

ways by Watanabe (2006), Borer (2005b), Cheng & Sybesma (1999). Reviewing in detail all these analyses would take us too far afield as, in many cases, these approaches are also driven by other motivations and are subject to critique that is not directly connected to our present purposes. We will thus consider, as an illustration of this general approach, Watanabe's proposals (Watanabe (2006)) for the DP structure involved in indeterminate-based distributive quantification, that is, the problem that we raised earlier. In a nutshell, the structure that he proposes is given in (21). The double-headed arrow indicates that an *agree* relation has been established between Q and #. According to Watanabe, the # head is responsible for singular/plural-type contrasts in languages like English and for classifiers in languages with a generalized classifier system.

(21)



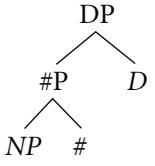
An important feature of Watanabe's approach, one which is, to a greater or lesser extent, shared by other approaches[12] in the same family, is that within this structure – at least at it stands in (21), number inflection and classifiers would be incompatible. In conceptual terms, Borer (2005b) suggests that the complementarity of distribution between plural inflection and classifiers – although directly accounted for in terms of these elements competing for the same position – is due to the fact that, in her terms, *all* nouns in *all* languages have a basic mass-type denotation. Just as classifiers impose structure and atomic division to the mass denotation, so does the plural in languages that have it.[13] However, although it is generally clear that plural and more generally

[12] Most prominently by Borer (2005) though she proposes very different structural representations.

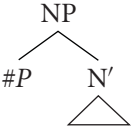
[13] We should note here that for Borer (2005) the domain of quantification is not structured in the way Chierchia proposes and what we have been assuming so far. It is not a semilattice in other words.

number inflection and classifiers are not mutually compatible, they are not always mutually exclusive either. We will discuss this immediately in the next section. Let us at this point also note that the complex structure provided by Watanabe for DPs in Japanese contrasts with the more parsimonious structures proposed in earlier literature. To illustrate, here are some of the structures that have been previously proposed:

(22) Tang (1990), Kawashima (1994), Kawashima (1998)



(23) Fukui & Takano (2000)



Ultimately, we will argue that one of the simpler structures is closer to the truth. Our account will suggest that the elements that one might be tempted to insert at the Q and D positions in (21) belong elsewhere. But let us first turn to classifiers and number.

6.4.1 *Classifiers and number*

Most theories somehow make a big issue of the fact that, in general, it seems that classifiers and number specifications are in complementary distribution. In fact, though, the incompatibility of classifier structure and number specifications is a rather idealized affair. There is a clear sense in which *kilo* in (24a) and *murder* in (24b) are classifiers; they specify unit structure, one would not expect them to pluralize, and one would not expect the head noun to pluralize either, which is what we see in (24):

(24) English

a. five kilos of rice

b. three murders of crows

Moving away from English, Chung (2000) reports that in Indonesian the co-occurrence of plural inflection with a classifier is also possible, though she qualifies this as not 'usual'. Witness (25):

(25) Indonesian[14]

a. Maka ku-lihat ada lima ěnam puloh orang hamba-hamba
then I-see exist five six ten Classif. slave.PL
laki-laki pěrěmpuan di-bawa Bugis.
male female Pass-take by.Bugis
'I saw fifty or sixty slaves, male and female, being led by a Bugis man.'

Closer still to our present concerns, Japanese also allows a combination of the plural morpheme *-tati* with classifiers. The appearance of the plural morpheme is optional and it cannot be attached to the classifier directly. *Tati*-plurals in Japanese are studied by Tomioka & Nakanishi (2004) who claim that they are exceptional in the sense that they represent associative plurals, though this does not seem to detract from the fact that plural inflection and classifier structure seem to co-occur.

(26) Japanese

a. Gakusei-(tati) san-nin kita.
student-PL 3-CL came
'Three students came.'

b. *Gakusei-(tati) san-nin-tati kita.
student-PL 3-CL-PL came
'Three students came.'

Staying with Japanese for a little longer, it is also illuminating to see what Corbett (2000) has to say, in his wide-ranging study on number, about number in Japanese:

> Consider again languages like Japanese which have general number and singular on the one hand, identical in form, as opposed to the plural on the other. This means that the plural can be used 'when it matters', to mark clear plurality, while the other form may indicate either that the noun is singular or that number is not important.
>
> Corbett (2000: p. 73f.)

Furthermore, Downing (1996: p. 205) gives the following table concerning the use of plural marking in Japanese (27):

[14] Example from Abdullah (1963: p. 222) cited in Chung (2000).

(27)

	referent type:	human	other animate	inanimate
NP head type	pronoun	required	required	required
	proper noun	required	rare	impossible
	common noun	possible	rare	impossible

Note, of course, that, when pronouns occur with numeral quantifiers, both a classifier and plural marking occur. What this table shows is precisely that statements about complementary distribution of classifiers and number are indeed highly idealized and that there are several other factors that come into play. So perhaps a more nuanced view is required. Let us finally turn to Korean.[15] Again, in Korean we see that the plural morpheme *-tul* can relatively freely co-occur with classifiers (28). The co-occurrence of classifiers and plural morphology should not be taken to mean that they can be juxtaposed. As we will see immediately, there is a case to be made for the incompatibility of the two *in the same syntactic position*. The sense in which they are not incompatible is that it is possible to have a pluralized noun and a classifier in the same DP. This is what we see in (28):

(28) Korean

Ai(-tul) se-myeong-i oassta.
child-PL 3-CL-NOM came
'Three children came.'

That the plural marker and the classifier seem to compete for the same syntactic position is shown in (29):

(29) *Ai-(tul) se-myeong-tul-i oassta.
child-PL 3-CL-NOM came
'Three children came.'

Thus, Korean gives us the opportunity to make an important distinction regarding the relationship between classifiers and number inflection. On the one hand it is clear that classifiers and number are not compatible essentially as realizations of the same head but at the same time they are not incompatible in a more general sense. This is expected if we take the view, contra Borer

[15] See also Kang (1994).

(2005b), that number does not provide us with unit structure;[16] this is the function of the classifier. Number only includes the independently supplied units. As a result, if we assume that there is a position classifier P it would be inappropriate for it to host number.

Finally, observe the examples in (30):

(30) a. Chelswu-ka mwul se-pyeng-ul sassta.
Chelswu-NOM water 3-bottle-ACC bought
'Chelswu bought three bottles.'

b. *Chelswu-ka mwul se-pyeng-tul-ul sassta.
Chelswu-NOM water 3-bottle-PL-ACC bought
'Chelswu bought three bottles of water.'

In these examples we are dealing with a true mass noun.[17] We observe two things here; first, that the plural morpheme cannot attach to the noun *mwul* (water). Furthermore, as pointed out above, it cannot even attach to the classifier. These examples suggest that Korean does instantiate a count–mass distinction, a rather unexpected situation under the NMP.[18] Note further that the situation in Korean is more complicated as the plural marker *-tul* can occur with other constituents; it can attach to the predicate and it can also show up on less canonical elements such as adverbs and complementizers. The following examples show the plural marker attached to an adverb:

(31) a. Ai-tul-i ppali-tul mekessta.
child-PL-NOM fast-PL ate
'The children ate fast.'

b. *Ai-ka ppali-tul mekessta.
child-NOM fast-PL ate

These cases have been dubbed *plural copying* as the plural marker on the adverb is only acceptable if the subject is also plural. It is difficult to discern what meaning that the plural marker contributes here. It is conceivable that it is related to degree but in fact if a *high degree* reading is intended the morpheme *-to* (also) must also be attached:

(32) Ai-tul-i ppali-tul-to mekessta.
child-PL-NOM fast-PL-CONJ ate
'Children ate very fast.'

[16] In Borer's terms, it does not have a dividing function.

[17] This is a true mass noun regardless whether or not one accepts the idea that the denotation of all nouns in Korean is mass. The noun *mwul* (water) will have to count as a mass noun.

[18] The extent to which the NMP entails the lack of a count–mass distinction is in fact debatable. It is conceivable that the distinction is attributable to further layers of structure. We will not pursue this idea here for lack of space.

We will leave a precise characterization of these readings aside. Just as in Japanese, plural marking in Korean is influenced also by other factors such as animacy and definiteness. Nonetheless, for our present purposes, the fact remains that there is no pure, simple, and straightforward incompatibility between classifiers and number inflection. As a result, we believe that this compatibility should be somehow structurally reflected. With the above in mind we will now turn to an examination of the structural necessities concerning the DP in Korean and Japanese. We will proceed by examining the extent to which each of the heads in Watanabe's structure is necessary. We use Watanabe's proposal because it is the richest in structure.

6.5 DP structure

We will now proceed to first examine the role of DP and then QP and CaseP. Our critique will be formulated in part from the standpoint of the nominal mapping parameter, the consequences of which we have partly been investigating.

6.5.1 *The role of DP*

What does the nominal mapping parameter predict concerning the role of DP in [+arg, −pred] languages? The following seem reasonable enough:

(33) a. That D will not be needed for argumenthood (nouns are [+arg]).
b. That D will be allowed as a locus of quantificational devices.

Prediction (33a) is widely known to be borne out. Observe also that languages like Japanese and Korean have a highly impoverished D system. They have no determiners to speak of really, in the sense that they don't really have definite or indefinite determiners. Other arguably D-like elements find a more appropriate home under different positions. These languages have demonstratives and sometimes these have been analysed as the definite determiner. For example, Kang (1994) suggests that Korean has a definite determiner *ku* which is homophonous to the demonstrative *ku* and is historically derived from it. This would be unproblematic as a case of reanalysis of a demonstrative as a definite determiner but Korean *ku* behaves for all intents and purposes as a demonstrative and there is little, if any, evidence that it is a definite determiner; therefore we will assume that it has not been reanalysed. Note, of course, that the fact that D is not required for argumenthood does in no way entail that a language *must* lack determiners. A definite determiner, interpreted as an ι operator, is in principle possible. However, it is not generally found. Let us now, for the sake of the argument, be allowed to draw the inference that

indeed these languages lack such determiner-like elements that occupy the D position. What's left then? Under Watanabe's view, the only things that end up in D are the elements *mo* and *ka* which he analyses as a universal and an existential quantifier respectively. But this is rather baffling. There is no sense in which in languages like Japanese and Korean a functional sequence D-Q is needed, unlike, say, what one finds in Greek where the definite determiner can be followed by a distributive quantifier.[19] Therefore, within his structure, the Q head, which seems otherwise to host nothing, looks like a more appropriate position for the quantificational heads than D. If this is so, a *mo/ka* phrase would be a bare QP. From this one might then conclude that there is no role for a DP in languages like Japanese/Korean, and as a result reject the idea that the D position projects as a rule in these languages. In the immediately preceding sentence, the phrase *as a rule* is key. Our suggestion here is *not* that Korean cannot have determiners, only that determiners are not necessary, as opposed to a language like French which requires them in all cases. Clearly other determiners or determiner-like elements may exist. We may even be wrong about the non-reanalysis of *ku* and yet our argument would not be affected much. A case in point here is the morpheme *-kes* which is found in head internal relative clauses and has been analysed as an ι operator and as a result similar to a definite. This does not imply, however, that there is a categorically distinct D element of the definite variety, but even if it did and even if it is such an element the argument remains the same. Let us now move to the status of QP.

6.5.2 *The role of QP*

Now, if the above is on the right track, then QP should host the quantificational particles (actual quantifiers on some accounts) *mo/ka*.[20] At least from this, admittedly crude, argument its existence is secure and unassailable. But the status of *mo/ka* as quantifiers or even quantificational particles that head a Q kind of projection is far from clear. Recall first of all the discussion in section 6.2.3 where we pointed out that the so-called quantificational particles are also independently used as conjunction and disjunction morphemes and, as is well known, the following logical equivalences hold:

(34) $\exists x(\varphi x) \leftrightarrow \varphi(x_1) \vee \varphi(x_2) \vee \varphi(x_3) \vee \varphi(x_4) \vee \ldots \vee \varphi(x_\infty)$

[19] Perhaps an argument *could* be found in Giannakidou (2004) where she proposes that D introduces the domain restriction. However, it is rather difficult to make this argument convincing for languages that seem to have no determiners at all. Fleshing out such an argument would, however, take us too far from our immediate concerns.

[20] Although we are using the Japanese particles in the text, we in fact refer to all quantificational particles of this type in either Japanese or Korean, so we could as well have said *to/na*, the Korean counterpart of *mo/ka*.

(35) $\forall x\, \varphi(x) \leftrightarrow \varphi(x_1) \wedge \varphi(x_2) \wedge \varphi(x_3) \wedge \varphi(x_4) \wedge \ldots \wedge \varphi(x_\infty)$

If we assume that (34) and (35) are in fact the templates following which the quantificational force of the combination of *Indp+mo/ka* is to be understood and ultimately derived, a plausible, if controversial, suggestion, then it follows that the particles are not quantificational at all really in the sense that they only indirectly supply quantificational force. In fact, in a system like the one developed in Gil et al. (2006), where the Hamblin system proposed by Kratzer & Shimoyama (2002) and Kratzer (2005) is adopted, it becomes completely obvious that the particles are not involved in quantification in the standard sense at all. To complete the picture, recall now the main problem with distributive quantification. If the particles are not directly involved in providing quantificational force, where does it come from? All other things being equal, we would like to draw here on a proposal that has been independently defended by several authors, regarding the origin of the quantificational force of *mo* phrases,[21] that their force does not derive from *mo* but a covert distributive operator rather than *mo* itself.[22] If this proposal is on the right track – and, of course, different authors propose different implementations of this idea – we can at the very least suggest that, whatever *mo* does exactly, the Q head is not the appropriate place for it as long as we want to keep close to a fairly clean distribution of morphological realizations to functional heads. Let's assume now that *mo/ka* aren't Q heads and the above remarks are on the right track. In Watanabe's system, nothing else is a Q head. The null hypothesis then is that Q and QP are also superfluous (see next section for the position of *mo*). Thus, no QP either. We are left with CaseP to deal with, and we turn to that immediately in the next section.

6.5.3 *The role of CaseP*

In order to assess the necessity for a special projection for case, we will examine and compare the distribution of classifiers in Korean and Japanese.

6.5.3.1 *Classifiers and CaseP: Korean vs. Japanese* Within the Korean/Japanese N/DP in the case of a phrase containing a numeral and a classifier, there are in principle two positions for the case particle to appear, namely adjacent to the N or adjacent to the classifier. The following data show that both Japanese and Korean instantiate both options but with the further twist that Korean allows doubling of the case particle which is then realized *both* on the N and on the classifier at the same time (see Gil (2001) for more details and references). Furthermore, notice the appearance of the genitive case marker in (36a) and

[21] And other equivalent elements in other languages.

[22] See Tancredi & Yamashina (2004), Giannakidou & Cheng (2006), Gil et al. (2006), and references therein.

(37a). Watanabe proposes that this is just a morphological addition without any structural consequence. However, it is strange that the same genitive morpheme is also used in Korean, which may then indicate that this is no accidental language-specific process.

(36) Korean: '*Three students bought a book/books.*'

a. Se-myeng-uy haksayng-i chayk-ul sassta.
3-CL-GEN student-NOM book-ACC bought

b. Haksayng-i se-myeng chayk-ul sassta.
student-NOM 3-CL book-ACC bought

c. Haksayng se-myeng-i chayk-ul sassta.
student 3-CL-NOM book-ACC bought

d. Haksayng-i se-myeng-i chayk-ul sassta.
student-NOM 3-CL-NOM book-ACC bought

(37) Japanese: '*Three students came.*'

a. San-nin-no gakusei-ga kita.
3-CL-GEN student-NOM came

b. Gakusei-ga san-nin kita.
student-NOM 3-CL came

c. Gakusei san-nin-ga kita.
student 3-CL-NOM came

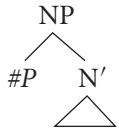
d. *Gakusei-ga san-nin-ga kita.
student-NOM 3-CL-NOM came

Unless one adopts an account under which only one of the two case particles heads a projection and the other one results from some non-local exceptional morphological process (not a particularly attractive suggestion), then it is difficult to see how to accommodate these types of data. Furthermore, from a more general point of view, it seems far more reasonable to assume that case is a feature of nouns rather than an extra head. Watanabe points out that if structural case is really an uninterpretable feature – in the technical sense – then CaseP should follow AgrP down the elimination route; that is, a functional head which only contains uninterpretable features has no reason to exist within a constrained framework. He does not agree with this suggestion. We do. His approach involves assigning meaning to case features (which would differentiate CaseP from AgrP); this is, however, by no means necessary. In fact, if case particles turn out to have specific meaning, as has indeed often been suggested in the past – for example, the nominative particle has often

been associated with focus – then one would expect those particles to head their own projections but those projections would hardly be case phrases; they would be more directly associated with the meaning carried by the particles. A case in point here is the work of Whitman (2001) who analyses the Japanese particles *wa* and *ga* as clausal heads. Therefore, it seems to us that no compelling case exists for CaseP either.

As a result, what we are left with after this elimination exercise is a structure that corresponds to one of:

(38) (a) 

(b) 

The proposal that we develop in the next section suggests that, of the two structures above, only (b) is instantiated in some cases and that, generally, nominals in Japanese/Korean are indeed bare.

6.6 An alternative analysis

In the previous section we have argued that languages of type (3a) in Chierchia's typology, and especially Japanese and Korean, do not require any highly elaborate functional structure; their NPs are indeed rather bare. But problems remain. Namely, if there is no elaborate functional structure on top of the NP in Korean and Japanese, how do we deal with quantification? If there is no dedicated position in the DP for the *mo/ka* particles, where are they exactly? In the next sections we will propose an analysis drawing on an important body of previous work whereby the quantificational particles are in fact clausal heads rather than DP-internal elements. For languages like Korean and Japanese where indeterminate-based quantification is pervasive, this seems to be the most appropriate solution. Let us now move on to sketch the basic ingredients of the analysis.

6.6.1 *Splitting the D*

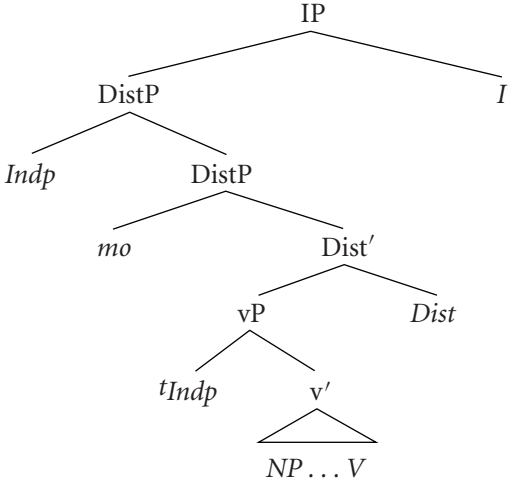
The analysis that we want to propose subscribes to the general idea that sentences are structured in blocks that involve repeated applications of a two-step process involving a lexical projection, usually a phase, and a set of functional elements that enter into specific relations with the items in the phasal projection. More specifically, a vP contains essentially lexical material and it is the functional elements in *interphasal space* that are responsible for standard notions such as tense and mood, but also for nominal quantification.

To make this general suggestion more precise, there are two families of ideas that we want to bring together here. First, the general proposal regarding scope-taking by Beghelli & Stowell (1997), Beghelli (1995), etc. We will assume now that there are so-called scope heads located in interphasal space.[23] Ultimately, we think that these heads recur in each phase, but for present purposes this suggestion will not need to be explored further. The second idea, due mainly to Dominique Sportiche (Sportiche (1997))[24] but also somewhat prefigured in von Stechow (1996), is that D and NP are not generated as constituents. D is generated high in the structure and the surface constituency is put together by movement.[25] Similar ideas are explored in Kratzer (2005).

6.6.2 *The basic structure*

In accordance with the guiding ideas outlined above, and stripping away all not immediately relevant aspects of the structure, our proposal can be represented graphically as in (39). *Indp* in the tree in (39) stands for indeterminate pronoun:

(39)



[23] For a fully fledged theory of interphasal space see Butler (2004). See also Tsoulas (2003) for similar proposals regarding floating quantifiers.

[24] For an exposition of Sportiche's ideas and an application see Hallman (2000).

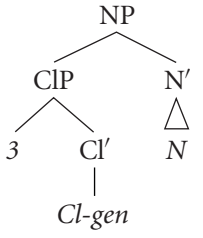
[25] We refer the reader to the works cited for arguments for this position coming from reconstruction, selection, scope, etc.

Concerning the case of indeterminate-based quantification the proposal is that the particle *mo* is realized in the specifier of the DistP projection and the indeterminate pronoun moves to a higher specifier of DistP. A relationship between the indeterminate and the *Dist* head is established since *Dist* is endowed with uninterpretable ϕ features which are valued by the features of the indeterminate; of course, *Dist* must also be endowed with an EPP feature to drive the actual movement but this is actually immaterial here. *Dist* is also the locus of the covert distributive operator. For the cases where we don't have *mo* but rather *ka* we assume that an ∃P is projected instead and it is in its specifier that the particle sits.

Let us now turn to the case of nominal structure. We have shown already that the D/Q layers are not necessary (subject to the caveats made above). Regarding the number morpheme and classifiers on the other hand we need to distinguish two separate cases. First, the case where the classifier appears prenominally and is case-marked with genitive case and, second, the case where the classifier is not case-marked and appears post-nominally. We will take the appearance of genitive to be indicative of the fact that the classifier phrase is located in the specifier of the NP and thus receives case there.

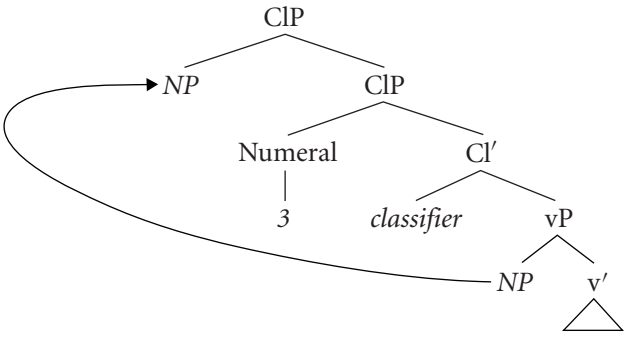
The structure we are proposing then is the following (40):

(40)



For the cases where no case marking appears we would like to follow an approach in the same spirit as the one with indeterminate-based quantification. Specifically we propose that the classifier phrase is part of the clausal spine and is not generated in constituency with the NP. The relevant structure is (41):

(41)



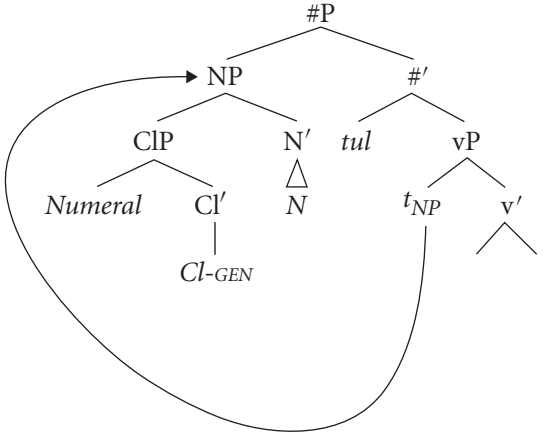
Finally, we need to consider the position of the number morpheme *tul*. The cases to consider are the orders in (42):

(42) a. Numeral-Classifier-Genitive Noun-*tul.*

b. Noun-*tul* Numeral-Classifier

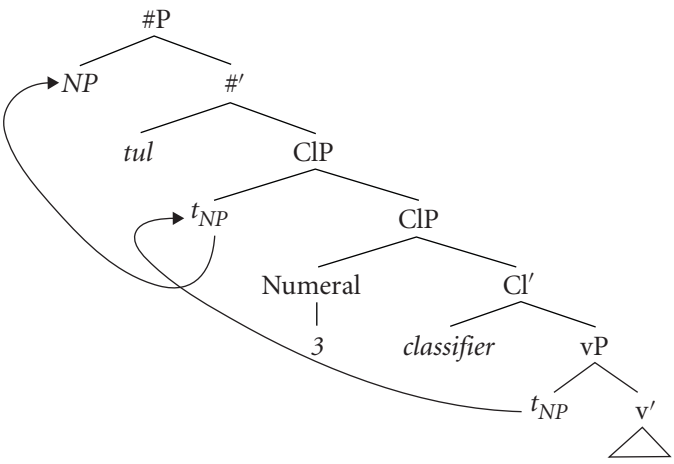
In the same spirit as above we will propose that number is also alongside the classifier a clausal head above ClP. A pluralized noun will be located in the specifier of the #P. The data follows straightforwardly in this analysis. For the case in (42a), the NP containing the ClP in its specifier will move as a whole to the specifier of #P as in (43):

(43)



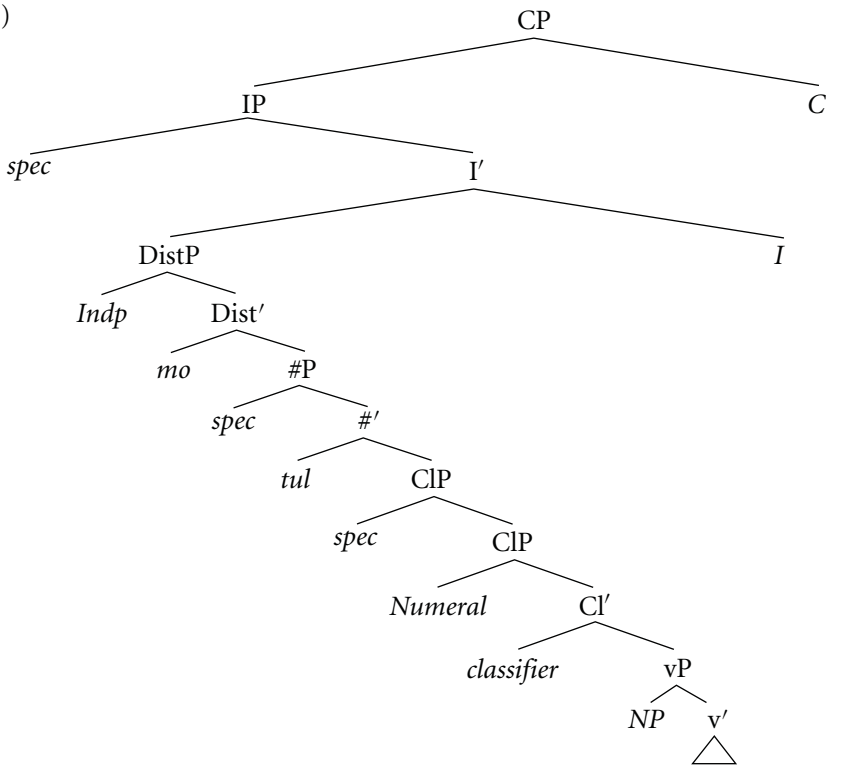
The same structure will be operative in the case of the order in (42b) with the only difference that the classifier will be realized in the lower head; the full structure in that case will be (44):

(44)



Let us make a few final comments regarding these structures. First of all, we have left out a few technical details which the reader can easily fill in. For example, we will have to implement the proposal in the form of agree relationship that is created between the # head and the NP and the classifier and the NP. Clearly the # and classifier heads must have some ϕ features; assume that they are uninterpretable. We can further assume that the NP has some sort of uninterpretable *unit/class* and number features, although this is not necessary. An agree relation would serve to satisfy both features and explain the association between the two elements. Second, although our implementation is very different, the use of two different heads for number and classifier is reminiscent of the ideas of Cheng & Sybesma (1999). Finally, it is instructive at this point to put together the structures that we proposed for number and classifiers and for indeterminate-based quantification. The first observation that we can make is that the full structure of the Korean IP/CP would look slightly strange since, if we are right, some of the clausal projections will be head-initial and some head-final. There is nothing particularly new about mixed-headedness but it bears pointing out that, in this case, there is no lexical/functional split but rather a nominal/verbal split; it is as if the verbal extended projection proceeded on the right (head-final) whereas the nominal one on the left (head-initial). A problem for this statement is the Dist projection, which is head-final. A distributive operator is not an exclusively nominal element (by any means). But, if we are to relate it to the morphemes like *mo/to*, then it may be argued that it is more closely related to the nominal domain. We will not decide the issue here. Assume for concreteness, however, that it is the case that the DistP was also head-initial; the full structure (with minor variations) would be like (45):

(45)



Before we conclude the chapter we would like to turn briefly to the issue of distributivity.

6.6.3 *On the distributivity problem*

Assuming that the function of a classifier is to provide the appropriate individual or the appropriate atom for the purposes of counting and quantification, the account proposed here makes the following prediction (46):

(46) Classifiers will not be needed in indeterminate-based quantification.

(46) follows from two things, in the first instance from the definition of the distributive operator. The one we assume is given in (47):

(47) For any one place predicate P and sum of individuals x: ^{D}P holds of x iff P holds of each individual part of x.

Second, it follows from the structure of the domain (see section 6.2.2), and the denotation of mass terms as sublattices of the latter. Indeed, we will not need a classifier to tell us what the atomic elements of the domain are, and

the distributive operator tells us that P(x) must be true of the atomic parts, whatever those parts are.

A numeral alone, on the other hand, does not provide any such information, and rightly so since the Korean NP in (48):

(48) saram sey-myeng
man 3-CL
'three men'

denotes sets of three men and we can easily imagine why we would need to actually specify the unit/atom such that (sets of) three of that unit will be the denotation of (48).

A perceived weakness, maybe, of this approach is that it suggests that the classifiers are not present in cases of indeterminate-based quantification because they are simply redundant, whereas, as we showed earlier, they are actually more than that, they are *impossible*. But this is not necessarily a really problematic situation. In support, consider the distribution of the distributive quantifier *kakkak* (each) in Korean and *sorezore* in Japanese, in comparison to *each* in English:

(49) a. Dono gakusee-mo hon-o ni-satsu kawanakerebaikenai.
which student-CONJ book-ACC 2-CL buy-must
'Every student must buy two books.'

b. *Sorezore-no dono gakusee-mo hon-o ni-satsu
each-GEN which student-CONJ book-ACC 2-CL
kawanakerebaikenai.
buy-must
'*Each of every student must buy two books.'

c. ?Dono gakusee-mo sorezore hon-o ni-satsu
which student-CONJ each book-ACC 2-CL
kawanakerebaikenai.
buy-must
'?Every student must buy two books each.'

(50) a. Etten haksayng-to kwacey twu-kay-lul nayyahanta.
which student-CONJ assessment 2-CL-ACC submit-must
'Every student must submit two assessments.'

b. *Kakkak-uy etten haksayng-to kwacey twu-kay-lul
each-GEN which student-CONJ assessment 2-CL-ACC
nayyahanta.
submit-must
'*Each of every student must submit two assessments.'

c. ?Etten haksayng-to kwacey twu-kay-lul kakkak
?which student-CONJ assessment 2-CL-ACC each
nayyahanta.
submit-must
'?Everyone must submit two assessments each.'

(51) a. ?Everyone bought two books each.
b. They bought two books each.

(52) a. *Each of everyone bought two books.
b. Each of them bought two books.

What we have in these examples is again, arguably, a case of redundancy, and yet the result in some cases is consistently ungrammatical and in others odd. Our suggestion is that classifiers in indeterminate-based quantification are cases of the (a) patterns above.

6.7 Some concluding remarks

So where does all this leave us? We began by bringing out certain paradoxical facts about distributive quantification in languages that Chierchia's nominal mapping parameter classified as [+arg, −pred]. The puzzle got compounded when taking into account recent proposals regarding the syntactic structure of the Korean and Japanese DP. Our critique of this syntax has found the case for an elaborate DP syntax wanting in several respects. We concluded that, although no structure was strictly speaking needed for the NP classifiers, distributive markers and number were structurally represented albeit as clausal projections. Intuitively, this is in keeping with the characterization given by the nominal mapping parameter and the idea, empirically supported, that nominal phrases in these languages are somehow *bare* in a real sense. This reasoning was then used as a springboard for the justification of analysis that places the best part of the burden for the construction of quantificational meanings in nominals not on the nominal structure itself but rather on this set of clausal functional elements. This is an instantiation of a general approach to the derivation of sentences, and the fact that basic phasal nodes are restricted in their meaning to abstract open propositional constituents with more unbound variables than usually assumed. Moreover, we saw that this approach gives us more analytical possibilities regarding the structures involved in classifier constructions. Much, of course, remains to be done. A comparison of this type of analysis with modification structures is necessary in order for this *quantification as modification* general view to bear fruit. But

this must await further study. As for the nominal mapping parameter itself, we believe that it is still a useful instrument that affords real understanding and captures systematic differences between types of language. The implementation that we have proposed retains of the parameter the core that is responsible for these generalizations.

One further point to make regarding the NMP is the suggestion that the setting [−pred, −arg] is an impossible setting. This is arguably not necessary. There could be languages where nouns can never be used *bare* in either predicate or argument positions and where further nominalizing or predicativizing structure is necessary. This is in keeping with recent proposals that NPs are dominated by *a little n* in a manner analogous to *little v*. We have no space to consider these issues further but, if something along these lines turns out to be true at least for nouns in predicate position, the NMP would have to be reformulated. We have also set aside here various problems that have been pointed out with respect to the mass–count distinction (see Cheng & Sybesma (1999), Borer (2005b), Tsoulas (2005) among others) and the way it relates to the NMP. We will have to leave a rethinking of the NMP for a future occasion.

This page intentionally left blank

Part II
Definiteness

This page intentionally left blank

7

Properties, entity correlates of properties, and existentials

LOUISE McNALLY

7.1 Introduction*

Setting aside obviously predicative uses of nominals, the claim that predicates can take property-type nominal arguments has been motivated on the basis of two very different kinds of data. On the one hand, Chierchia (1984) discussed cases in which a predicate such as *fun* or *good* can apply to a nominalized property such as in the following examples:

(1) a. Fun is fun.
    b. Goodness is good.

Such examples, he argued, show that some predicates denote true properties of properties. His analysis, as we will see below in greater detail, technically did not involve assigning nouns such as *fun* or *goodness* to type $\langle e,t \rangle$ or its intensional counterpart; rather, he modelled these nouns as *entity correlates of properties*, a sort within type *e* deeply similar to a Carlsonian kind. Thus, (1a) could be translated as in (2), where **fun** is of type $\langle e,t \rangle$ and **f** stands for the entity correlate of the property 'fun'.

(2) **fun**(**f**)

On the other hand, McNally (1995), Geenhoven (1998), and many subsequent works have posited that verbs that denote properties of or relations between what I will call 'ordinary' individuals or *particulars*[1] can nonetheless

* I am grateful to Sandy Chung, Maria Teresa Espinal, Olav Müller-Reichau, Veerle van Geenhoven, two anonymous reviewers, and audiences at the University of Leipzig, the Workshop on Indefinites and Weak Quantifiers (Brussels), and the Workshop on QPs, Nominalizations and the Structure of DP (Saarbrücken) for comments and discussion.

[1] While this is an admittedly vague term whose extension might be difficult to decide in extreme cases, for now it is sufficient that the reader take it to include humans and other physical objects.

combine with property-type nominals via a mechanism which van Geenhoven termed 'semantic incorporation'.[2] For example, van Geenhoven proposed that English bare plurals denote properties and that verbs such as *eat* could be translated not only as in (3a) but also as in (3b), permitting semantic incorporation of a property-type complement as in (3c).[3]

(3) a. $\lambda y \lambda x [\mathbf{eat}(x,y)]$

b. $\lambda P \lambda x \exists y [\mathbf{eat}(x,y) \wedge P(y)]$

c. $\mathrm{T}(\textit{eat cookies}) = \lambda P \lambda x \exists y [\mathbf{eat}(x,y) \wedge P(y)](\mathbf{cookies})$
$= \lambda x \exists y [\mathbf{eat}(x,y) \wedge \mathbf{cookies}(y)]$

There are two differences between these analyses. One is (at least apparently) superficial: Chierchia treated property-type arguments as entities, while van Geenhoven formalized them as functions. The other difference is substantial: Chierchia is concerned with predicates that fundamentally (at least can) describe properties, while van Geenhoven is concerned with predicates that fundamentally describe ordinary individuals but which happen to compose semantically with property-type expressions that provide descriptions of the ordinary individual in question. These differences are not necessarily related. For example, McNally's 1998 analysis of existential sentences has a predicate that denotes a true property of properties combine with an $\langle e,t \rangle$-type argument, while Müller-Reichau (2005) presents a version of semantic incorporation based on Farkas & de Swart (2003) which uses an e-type formalization for the property argument.

The choice between formalizing a property as an entity or a function might seem to be a technical matter difficult to decide upon on empirical grounds (though see Chierchia (1984), Müller-Reichau (2005), and below for possible empirical arguments). In contrast, in most cases it is intuitively very clear whether a predicate denotes a property of a property or an individual: no one who advocates semantic incorporation for a verb like *eat* would suggest that we eat properties, and it is difficult to imagine the denotation of a noun like *goodness* as anything but an abstract object, though it might be difficult to decide exactly what kind of abstract object it is. But there is at least one class of cases where it is not at all obvious whether true predication of a property to a property vs. ascription of a property to ordinary individuals is

[2] de Hoop (1992) proposed a slightly different version of essentially the same idea on which the nominal in question denoted a verbal modifier.

[3] See de Farkas & de Swart (2003) and Chung & Ladusaw (2004) for different approaches to combining verbs with property-type nominals. For most of the purposes of this chapter, which approach we adopt will not be crucial and, unless stated otherwise, I will use *semantic incorporation* as a generic term for any analysis on which a predicate that 'deeply' selects for an e-type argument combines with a property-type one.

involved: that of existence statements. When this ambivalence is combined with the possibility of a semantic incorporation analysis, things suddenly get rather murky. Just how murky can be seen in the fact that, while both kinds of property predications have been used to analyse existential sentences in various languages (see, for example, McNally (1992) for an analysis inspired in Chierchia's work; see also Geenhoven (1998), Chung & Ladusaw (2004) for semantic incorporation analyses on which the existential predicate denotes a property of ordinary individuals), the fact that these analyses are fundamentally different has arguably not even been noticed, let alone discussed.

The goal of this chapter is to examine this class of cases, using the English *there*-existential predicate as a paradigmatic example. I will argue that *there*-existentials are best analysed as involving true property predications, rather than semantic incorporation. More generally, I wish to encourage more careful thinking about what is semantic incorporation and what isn't, and what kinds of criteria can decide in any given case. The discussion will have two important consequences beyond any it might have for our understanding of semantic incorporation itself. First, it serves as a reminder that there might be cross-linguistic (and even within-language) variation in the semantics of existence statements. The diagnostics I will use for *there*-sentences, when coupled with relatively conservative theoretical assumptions, predict three general patterns of variation which appear to be attested. Second, the analysis will make use of entity correlates of properties outside of the domain of the analysis of generics/bare nominals, practically the only place they have been used in the literature (with the obvious exception of Chierchia (1984); see also McNally (1992), Müller-Reichau (2005)). As will become clear, this use raises questions – largely unanswered here – about how entity correlates of properties and kinds are related.

The structure of the chapter is the following. After presenting the logically possible analyses for existence statements in section 7.2, I argue in sections 7.3 and 7.4 for the analysis originally presented in McNally (1992). Section 7.5 briefly discusses typological variation in existence statements and provides some candidates for instantiations of this variation.

7.2 Properties, entity correlates of properties, and the lexical semantics of the *there*-existential predicate

7.2.1 *Two possible lexical semantics for the existential predicate*

Strawson (1959: 241) identified a crucial property of existence statements which has important implications for the semantics of existence predicates:

> [W]e can . . . admit the possibility of another formulation of every . . . existentially quantified statement, and, with it, the possibility of another use of the word 'exists', a use which is equally univocal throughout the range of its applications. We can . . . reconstrue every such quantified proposition as a subject-predicate proposition in which the subject is a property or concept and in which the predicate declares, or denies, its instantiation.

Strawson's observation can be recast as a hypothesis about the semantics of existence predicates as a class.[4] Such predicates might have one of two general types of semantics, subject to within-language and cross-linguistic variation. The first I will call an 'exist'-type semantics. On such a semantics the predicate denotes a property of (or a relation involving, as the relevant argument) a particular, an individual such as my cell phone or my daughter. Thus, a sentence such as (4a) could be translated as in (4b), where for the sake of illustration I treat the indefinite *a white gorilla* as denoting the entity returned by a choice function f on the set of white gorillas (see, for example, Reinhart (1997), Kratzer (1998a)).[5]

(4) a. There was a white gorilla (at the Barcelona Zoo).

b. $\mathbf{exist}(f(\lambda x[\mathbf{gorilla}(x) \wedge \mathbf{white}(x)]))$

The analyses of *there*-existentials in Barwise & Cooper (1981) and Keenan (1987) exemplify such a lexical semantics.[6]

The second general type of analysis involves what I will call an 'instantiate'-type semantics: The predicate denotes exclusively a property of (or a relation involving, as the relevant argument) a *nonparticular,* modelled here as an entity correlate of a property. What is an entity correlate of a property? Chierchia (1984) posited that all first order properties had counterparts in the entity domain in order to analyse cases of self-predication such as (1a) in a system that avoids both paradoxes associated with self-predication and empirically unmotivated type proliferation. He defined two functions which relate properties-qua-functions to their entity correlates: $^{\cap}$, a function from type $\langle e,p\rangle$[7] to type e; and $^{\cup}$, in the opposite direction, as shown in (5) (see Chierchia (1984: 149ff.) for details).

[4] I take this class to be broadly construed. For example, in English it might include not only *exist* and *there be* but also the so-called existential *have.*

[5] Reinhart existentially quantifies the choice function variable; Kratzer treats it as free. Here I follow Kratzer.

[6] The analyses of Barwise & Cooper and Keenan of course differ in their treatment of the postverbal nominal, which in both cases is taken to denote a generalized quantifier. What is crucial here is the semantic type of the existence predicate.

[7] Chierchia used an intensional property-theoretic semantics on which tensed clauses denote propositions, which like entity correlates of properties constitute a special sort (represented here as p) within type e. For our purposes, however, properties could be treated as is usual in a set theoretic extensional semantics.

(5) $^{\cup\cap}$**gorilla** = **gorilla**

Chierchia (1984: 18) observed that entity correlates of properties were used by Cocchiarella (1976) to model kinds, and he himself has used them to model kinds in subsequent work (e.g. Chierchia (1998a)). While we will see shortly that not all expressions that we will take to denote entity correlates of properties are plausible candidates for kind terms, treating kinds formally as a proper subclass of the entity correlates of properties will prove useful.[8] Using this notion of entity correlate of a property to model Strawson's concept of a nonparticular, an 'instantiate' semantics for (4a) would be as in (6).

(6) **instantiate**($^{\cap}\lambda x$[**gorilla**(x) $\wedge$ **white**(x)])

Such an analysis was defended for *there*-existentials in McNally (1992).

If we assume that the only composition operation available is function application and that quantification must be first order (a hypothesis that Chierchia (1984) also argued for), it is simple to distinguish these two analyses empirically. A predicate with an 'exist'-type semantics (I will assume that *exist* is one) will combine with expressions that denote particulars or quantifiers over them. The sentences in (7), particularly (7b), ostensibly illustrate these combinatorial possibilities.

(7) a. Tipitina's[9] still exists amidst the devastation in New Orleans.

b. Each building I've shown you a picture of really exists.

In contrast, a predicate with an 'instantiate'-type semantics (such as, I will argue below, *there be*) should *not* combine with expressions that denote particulars but rather only with nonparticular-denoting expressions or quantifiers over them. This expectation is borne out by data such as those in (8). S*inging* is a prototypical example of the sort of nominal that Chierchia treated as denoting an entity correlate of a property. The contrast between (8b) and (8c) shows that quantification is possible only over certain kinds of entities, namely those describable by nouns such as *type* but not, for example, *piece*, indicating that quantification over particulars is excluded while quantification over nonparticulars is licensed.

(8) a. There was singing.

b. There was every type and brand of farm and forestry equipment available.

c. *There was every piece of equipment available.

[8] See Farkas & de Swart (this volume) for additional discussion of the semantics of kind terms.

[9] Tipitina's is an emblematic New Orleans bar.

However, the examples in (9) appear problematic, as neither indefinite DPs nor proper names are intuitive candidates for nonparticular-denoting expressions.[10]

(9) a. There were two buildings standing after the hurricane.
b. There was Tipitina's.

Nonetheless, both types of DPs can be assigned a property-type denotation via the type-shifting rules in Partee (1987), and then can be shifted via $\cap$ to entity correlates of properties. Such cases lead us to adopt the position that kinds are at most a proper subclass of the entity correlate of properties.[11]

7.2.2 *Semantic incorporation and related analyses*

If this were all that needed to be said about semantic composition, it would be relatively straightforward to pursue an investigation of the semantics of existential predicates. But things are not so simple. van Geenhoven's formalization of semantic incorporation, and composition rules like Chung and Ladusaw's 'Restrict' rule (Chung & Ladusaw (2004)) permit – or in idiosyncratic cases even require – an existence predicate with an 'exist' semantics to combine with a property-type expression (the latter treated by both van Geenhoven and Chung and Ladusaw as a function rather than as its entity correlate).

An example of West Greenlandic noun incorporation appears in (10); (11) provides the analysis in Geenhoven (1998: 166). The existential predicate *-qar-* is treated by van Geenhoven as essentially locative, establishing a relation between a particular (represented by the existentially quantified variable *y*) and a location (specified in a step posterior to (11b) by *nillataartarfim-mi*). However, as it is obligatorily incorporating, it will always combine with a property-type located-entity argument (here, *manne* 'egg').

(10) Nillataartarfim-mi tallima-nik manne-qar-p-u-q.
fridge-loc five-inst.pl egg-have-ind-[-tr]-3sg
'There are five eggs in the fridge.'
(W. Greenlandic, van Geenhoven (1998: 164))

[10] The fact that (9b) might be usable only in restricted contexts is not relevant here – if it is usable in at least some contexts, it must be interpretable, and we must therefore give an account of its semantics. The same is true of definite descriptions, though, unlike the examples in (9), definite descriptions do have natural uses as nonparticular-denoting expressions in at least some contexts in English.

[11] Krifka (1995), following Pelletier & Schubert (1989), makes a similar distinction between kinds and what he calls 'concepts' (a sort of entity properly including the kinds) on the basis of Chinese data, though his analysis is based on examples which involve bare nominals modified by relative clauses (e.g. the Chinese equivalent of 'gentleman who is wearing blue clothes'), which are perhaps closer to prototypical kind terms than those in (9).

(11) a. T(*-qar-*): $\lambda P \lambda LOC \lambda w \exists y[P_w(y) \wedge LOC_w(y)]$

b. T(*manne-qar-*): $\lambda LOC \lambda w \exists y[\mathbf{manne}_w(y) \wedge LOC_w(y)]$

As an alternative to adjusting the verb's semantics in order to resolve what would otherwise be a type mismatch between predicate and argument, Chung and Ladusaw propose a special composition rule they call 'Restrict', which allows property-type expressions to act as restrictive modifiers on predicates denoting properties of or relations between particulars. They use Restrict for the semantics of sentences like (12), an example of the Maori existential construction involving the special indefinite *he*-nominal, which Chung and Ladusaw claim is lexically marked to combine only via Restrict. The crucial step is shown in (13) (Chung & Ladusaw (2004: 10, 53)); they apply a general rule of existential closure and subsequent negation to arrive at a complete translation for the sentence.

(12) Kāhore he taniwha.
T.not a taniwha
'There are no taniwhas.'
(Maori, Chung & Ladusaw (2004: 53), ex. due to Bauer)

(13) Restrict($\lambda x[\mathbf{exist}(x)]$, $\lambda x[\mathbf{taniwha}(x)]$) = $\lambda x[\mathbf{exist}(x) \wedge \mathbf{taniwha}(x)]$

Yet another technique for achieving the same result appears in Chierchia (1998a), and is based on Carlson's composition rule for object- or stage-level predicates (Carlson (1977a)) that combine with kind terms. Chierchia adopts an 'exist' semantics for *there*-sentences but allows the existential predicate to combine with entity correlates of properties via what he terms 'Derived Kind Predication' (hereafter, DKP; see also Müller-Reichau (2005), who extends a very similar analysis to Maori *he*). The derivation for (14) is illustrated in (15):

(14) There is a problem.

(15) a. T(*there be*) = $\lambda x_o[x_o = x_o]$

b. $\lambda x_o[x_o = x_o](^{\cap}\mathbf{problem})$

c. DKP: If P applies to objects and k denotes a kind, then $P(k) = \exists x[^{\cup}k(x) \wedge P(x)]$

d. $\exists x[^{\cup\cap}\mathbf{problem}(x) \wedge \lambda x_o[x_o = x_o](x)] = \exists x[\mathbf{problem}(x) \wedge [x = x]]$
$= \exists x[\mathbf{problem}(x)]$

It is important to emphasize that something like DKP is going to be needed no matter what our analysis of existential sentences is. As Carlson noted, at least in English, it is quite generally possible for kind-denoting expressions

(e.g. DPs containing nouns like *kind*) to appear in argument positions that correspond sortally to particulars, as in (16).

(16) a. I've never eaten that kind of meat.

b. That brand of cereal is available at our local supermarket.

DKP differs from both van Geenhoven's version of semantic incorporation and Restrict in that, to my knowledge, it has not been proposed that DKP be an obligatory composition rule associated with an arbitrary predicate or set of predicates. Rather, it is a freely available option for, in principle, an unrestricted class of predicates. Thus, modulo the definiteness effect (which Chierchia suggests is pragmatic), on the DKP analysis existential sentences are just like those in (16) or any others in which kind-denoting expressions occupy object- or stage-level argument positions.

The question that concerns us is: How can we distinguish the analyses in (11), (13) and (15) from that in (6)? First, we must look for evidence to decide whether the relevant argument should be analysed as a property-qua-function or as its entity correlate. If we find the latter, we will have evidence for (11) or (13); if we find the former, we will have evidence for (6) or (15). Second, we must try to identify selectional restrictions on the argument position of the relevant predicate which would support its being restricted to nonparticulars (cp. *extinct*). If it is so restricted, we will have support for (6); if it is not, any of the other three analyses might be viable. Combining these two diagnostics we can distinguish between (6), (15), and (11)/(13). In this chapter I will not investigate arguments for/against (11) and (13) or other implementations such as Farkas & de Swart (2003). I now turn to the first type of evidence we need.

7.3 Arguments against a functional-type complement for *there*-sentences

7.3.1 *Categorial restrictions on the postverbal expression*

A simple and yet convincing argument against assigning the postverbal expression in *there*-sentences a functional type comes from the fact that it must be a nominal. Other non-finite predicative expressions such as APs, PPs, and bare singular count nominals, which are all felicitous in typical predicative positions, are excluded from *there*-sentences. This contrast between *there*-existentials and true predicative contexts is shown in (17) and (18).

(17) a. *There was happy.

b. *There is professor of philosophy at Yale.

c. There was happiness.

(18) a. She was happy.
b. She is professor of philosophy at Yale.
c. That is happiness.

Chierchia (1984: 48) suggests that adjectives such as *happy* denote properties-qua-functions, and that precisely the job of determiners and nominalizing affixes is to produce expressions that can serve as arguments for predication:

(19) $T(\textit{happiness}) = {}^{\cap}\mathbf{happy}$

In contrast, the failure of non-nominal property-type expressions and bare singular nominals to appear in *there*-existentials is not straightforwardly predicted by any analysis which assigns the postverbal expression a functional type – such an analysis must resort to a syntactic constraint requiring the postverbal expression to be a DP. This is unattractively *ad hoc* given that in other contexts (such as copular constructions) acceptability depends on semantic type rather than on syntactic category.[12]

7.3.2 *Quantification over the postverbal argument*

A second argument that *there be* does not combine with a property-qua-function comes from sentences that involve quantificational DPs in the postverbal position of the kind first discussed to my knowledge in Lumsden (1988), and exemplified in (20):

(20) I divided up the dogs by the type of head that they had. There was the Terrier-type head (Type 'B' Head), the Spaniel-type head (Type 'C' Head), and the Bulldog-type head (Type 'A' Head).... In the Small British Terriers group ... **there is each type of head**. (http://www.geocities.com/great_pyreneez_kennelz/wolftodog2.htm)

The semantics in (6) accounts directly for these examples: *each type of head* can quantify unproblematically over the existential predicate's argument if *type* ranges over entity correlates of properties (represented by variables with a subscripted *P*):

(21) a. $T(\textit{type of head})$: $\lambda x_P.\mathbf{type}(x_P, \mathbf{head})$
b. $(\mathbf{each}\ x_P\colon \mathbf{type}(x_P, \mathbf{head}))[\mathbf{instantiate}(x_P)]$

[12] See Farkas & de Swart (2003) and Dayal (2003) for additional relevant argumentation involving bare singulars.

The DKP analysis also has no problem:

(22) a. (**each** x_P: **type**(x_P, **head**))[$\lambda x_o[x_o = x_o](x_P)$]

b. (**each** x_P: **type**(x_P, **head**))[$\exists x[^{\cup}x_P(x)]$]

On a semantic incorporation or Restrict analysis we have two options. I will use Restrict to illustrate. The first is to have *type of head* denote a second order property (see, for example, de Swart (2001)) and to allow *each* to denote a relation between second order properties. A derivation is shown in (23). I assume a tripartite logical form structure, following Heim (1982), as in (23a). Both the restriction and the nuclear scope of the operator **each** are translated as open formulae ((23b,c)). Existential closure on the nuclear scope (represented by the operator EC) binds all variables other than the one bound by **each**. The translation of *each* will combine by function application (which Chung and Ladusaw represent via the relation FA) with that of *type of head* and then that result will combine by the same rule with the rest of the sentence, as in (23d).

(23) a. [$_{IP}$ each [$_{DP}$_type of head] [$_{IP}$ there was_]]

b. T(*_type of head*): λP.**type**(P, **head**)(P) = **type**(P, **head**)

c. T(*there was_*): Restrict(λx[**exist**(x)], P) = λx[**exist**(x) $\wedge$ $P(x)$]
EC(λx[**exist**(x) $\wedge$ $P(x)$]) = $\exists x$[**exist**(x) $\wedge$ $P(x)$]

d. T(*there was each type of head*) = T(*each* [*_type of head*] [*there was_*])
= FA(FA(**each**, [**type**(P, **head**)]), $\exists x$[**exist**(x) $\wedge$ $P(x)$])

This analysis doesn't run into any immediate empirical problems. However, it is subject to the same criticisms that motivated Chierchia (1984: 77ff.) to adopt what he called the 'three-layer hypothesis': the hypothesis that all expressions of natural language can be typed as entities (whether particulars, entity correlates of properties, or propositions), first order properties, or second order properties, the latter being strictly limited to quantificational determiners and certain adverbs. First, allowing common nouns to denote both first and second order properties results in an unattractive and empirically unmotivated proliferation of types for other categories. Second, it offers us little insight into various data Chierchia discusses, such as the fact that determiners, complementizers, and nominalizing affixes exist at all, or the fact that there is little or no independent evidence for second order quantification (other than precisely the example under discussion) or anaphora to second order properties in natural language.

The second option for a semantic incorporation/Restrict analysis is to have *type of head* denote a property of entity correlates of properties and use type coercion or an alternative composition rule to permit the combination of the

quantifier (or an associated bound variable) with the existential predicate. For example, we would have to develop an alternative rule, Restrict′, which would combine a predicate denoting a property of individuals with an expression denoting an entity correlate of a property, ultimately yielding the same result as Restrict.

(24) FA(FA(**each**, λx_P[**type**(x_P, **head**)]), Restrict′(λx[**exist**(x)], x_P))

However, note that this rule is effectively indistinguishable from DKP.

In sum, while the empirical arguments are not definitive, the possibility of quantification over the postverbal argument in *there*-existentials offers no reason to treat the postverbal nominal as a functional type; rather the opposite. Moreover, if we find that just those languages (with determiners) that permit bare singular nominals in their existential constructions are precisely those that exclude quantification similar to that in (20) in those same constructions, we will have even more reason to consider the diagnostics in this section and the previous one to be reliable indicators as to the semantic type of the relevant nominal.

7.3.3 *What about pronouns?*

One potentially serious problem for the claim that the postverbal nominal denotes the entity correlate of a property comes from data such as (25) together with those in (26):

(25) *No perfect relationship is such that there is it.

(26) a. Every kind of machine has its defects.

b. Every kind of wine becomes more popular after Santi writes about it.

c. Every kind of animal engenders sympathy once it's extinct.

d. ??Every type of head is such that there is it.

Sentences such as (25) led Heim (1987: 23) to propose the constraint in (27):

(27) **There be x*, when x is an individual variable.

If the nominal denotes an entity correlate of a property, and in general entity correlates of properties can be referred to using the pronoun *it*, as (26a–c) would suggest, it is hard to explain why (25) and more crucially (26d) are unacceptable.

However, the pronominalization facts are not so simple. Not all pronouns are excluded from existential constructions. Deictic (or potentially deictic)

pronouns are acceptable in the same contexts as definites and names are; only *it*, which is never deictic, is completely unacceptable:

(28) a. [Talking about who/what can help:] There's me/you/us/her/them/this/that.

b. ??There's it.

Any account of the distribution of pronouns based simply on definiteness or on at least the simplest interpretation of the constraint in (27) will have trouble explaining the contrast in (28). This contrast suggests that the problem in (25), (26d) and (28b) is the necessary anaphoricity of the pronoun *it*. Given that *there*-existentials must be independently associated with some kind of pragmatic condition related to the novelty of the postverbal nominal (see McNally (1992), McNally (1998) and references cited therein on the independent roles of semantic and pragmatic factors in accounting for the definiteness effect), we might account for the restriction on *it* via the constraint in (29), where the notions 'discourse-new' and 'hearer-old' are taken from Prince (1992). The former refers to a referent which has not been previously mentioned in the discourse; the latter refers to a referent which is part of the common ground, whether because of previous mention or simply because of shared knowledge.

(29) The postverbal nominal in a *there*-sentence must be able to introduce a discourse-new (if possibly hearer-old) referent.

(29) is a slightly weaker version of the constraint on postverbal nominals in existentials proposed in Ward & Birner (1995), but is compatible with the data they discuss in their paper.

7.4 Arguments for an 'instantiate' semantics over an 'exist' semantics

Now let us return to the choice between an 'instantiate' semantics such as (6) and an 'exist' semantics which permits entity-correlate-of-a-property arguments via Derived Kind Predication. Recall that one way to distinguish the two would be to identify (in the case of an 'instantiate' semantics) or fail to identify (in the case of an 'exist' semantics) selectional restrictions on the argument of the relevant predicate which would support its being restricted to nonparticulars. I know of two such potential restrictions for English *there*-sentences. The first involves subject contact clauses (i.e. *that*-less subject relatives); the

second becomes evident when we consider relativization out of the postverbal position in *there*-sentences.

7.4.1 *Subject contact clauses*

Subject contact clauses are found in certain dialects of English, perhaps most productively in Appalachian English and Hiberno-English. My discussion is based on that in Doherty (1993) and all data mentioned here are taken from his work. In all dialects that permit subject contact clauses, they are licensed only in a restricted set of contexts. In the least permissive dialects, they appear only in the postverbal DPs in *there*- and *have*-existentials (30a,b), in *it*- and pseudo-clefts (30c,d), and in copular sentences with impersonal subjects such as (30e):

(30) a. There's **a man here can't speak English**.
b. I have **an idea might work**.
c. It was **Bill did it**.
d. **The only one can do it** is John.
e. Here's **the one'll get it for you**.

While there has been debate as to whether the contact clause forms a constituent with the noun it modifies (see, for example, Erdmann (1980)), Doherty (1993: 92ff.) provides convincing arguments that they are indeed relative clauses that form a constituent with this noun.

In more permissive dialects, such as Appalachian and Hiberno-English, subject contact clauses have a rather wider distribution, being licensed in certain modal contexts ((31a)); as complements to intensional verbs such as *seek*, where they have a strong or exclusive preference for *de dicto* readings ((31b)); in a slightly wider variety of copular sentences (e.g. (31c)); and in the restriction of universally quantified DPs ((31d,e)):

(31) a. I'd like to meet **the man would play-act on Larry**.
b. I'm looking for **someone speaks Irish well**.
c. John is **the only one can do it**.
d. **Any man can't fight for his friends** had better be dead.
e. **Everyone lives in the mountains** has an accent all to theirself.

In contrast, they are excluded from extensional contexts other than those mentioned above ((32a,b)) and from other copular sentences which Doherty

does not precisely define but which appear to be more predicational in nature than those in which contact clauses are acceptable (e.g. (32c)):

(32) a. *__A man speaks Irish__ walked into the bar.
b. *I gave a ticket to __a man comes every day__.
c. *John is __a doctor treats his patients well__.

It is difficult to find a positive generalization that will account for all the facts; however, what is clear is that if we posit an 'exist' semantics for *there*-existentials, it will be impossible to distinguish a context like that in (30a) from, for example, those in (32a,b), since *there*-sentences are typically considered extensional.[13] In contrast, on the 'instantiate' semantics, we have at least the hope of assimilating the postverbal position to that in copular sentences under the following generalization, adapted from Doherty:

(33) Subject contact clauses are licensed only in nominals that do not introduce persistent discourse referents into the discourse model.

This generalization extends to *there*-existentials because on the 'instantiate' analysis it is not the nominal that introduces the discourse referent; rather, as argued in McNally (1992), the referent is introduced indirectly via inference based on the lexical entailments of the existential predicate.

To account for these facts on the DKP analysis, two assumptions are necessary. First, we must assume that subject contact clauses are acceptable as modifiers of kind-terms. This seems unproblematic. However, the second assumption is untenable, namely that kind terms and DKP are systematically excluded from extensional contexts such as those in (32a,b); if they weren't, we would expect subject contact clauses to show up in those contexts as well. But this assumption is obviously falsified by examples such as the following:

(34) a. The kind of man you mentioned just walked into the bar.
b. I gave a ticket to the kind of man you are looking for.

Analogous assumptions must be made to account for the facts on a semantic incorporation/Restrict analysis, the equivalent to the second assumption above being that semantic incorporation/Restrict is not a combinatorial option in extensional contexts such as (32a,b). However, no language for which such operations have been proposed limits them in this way. Therefore, it would be quite odd for English to allow semantic incorporation or Restrict

[13] The only characterization of existentials as intensional that I know of is that in Farkas (1981), on which the postverbal nominal is given a very similar analysis to the one I argue for below.

just for sentences such as those in (30) or (31) but not for extensional contexts as a whole.

In sum, an 'instantiate' semantics for *there*-sentences offers better prospects for explaining the distribution of subject contact clauses than does an 'exist' semantics.

7.4.2 *Relativization out of* there*-sentences*

I now turn to the relativization facts. In order to show how these facts argue for an 'instantiate' semantics for *there*-sentences, it is first necessary to review briefly what has previously been said about such relative clauses. Relative clauses whose gap corresponds to the postverbal nominal in a *there*-existential, such as those in (35), have been claimed to have only amount readings and not ordinary restrictive relative readings (see, for example, Carlson (1977b), Heim (1987), Grosu & Landman (1998)).

(35) a. Bruce has scooped almost every trophy there is.

b. . . . you . . . think you've tried just about every remedy there is . . .

c. . . . it will be overburdened with all the problems there are in the community . . .

Intuitively, an amount reading is one on which an amount rather than a given object or set of objects is described. For instance, the amount reading of (36a) is true if Marv can fit 10 marbles in his pocket simultaneously and he puts 10 out of the 20 in his possession in his pocket at one time. The amount reading of (36b) is the only plausible one – it requires that we be able to drink the same amount of champagne as was spilled, not necessarily the same liquid.

(36) a. Marv put everything he could in his pocket. (Carlson (1977b: 528))

b. It will take us the rest of our lives to drink the champagne that they spilled that evening. (Heim (1987: 38))

Looking again at the examples in (35), it is not obvious that they have a reading that makes reference exclusively to amounts. In fact, an important difference between amount relatives and relatives out of existentials is that the latter always impose an identity of individuals requirement that is not imposed by amount relatives (McNally (1992), Grosu & Landman (1998)). For example, (37) cannot be true if there were five books on the shelf, and I read five books (in the relevant context) some or all of which were distinct from the five on the shelf:

(37) I read the books there were on the shelf.

However, the claim that relatives out of *there*-existentials have an amount reading despite this identity of individuals condition has been made on the basis of two observations. First, both amount relatives and relatives out of *there*-existentials appear to be restricted to a definite/universal determiner on the head noun (though we will see a few counterexamples below).

(38) a. ??Marv put something that he could in his pocket.

b. ??Bruce has scooped two trophies there are.

Second, at least in some dialects of English both amount relatives and relatives out of *there*-existentials allow only a *that* or null relative pronoun and do not easily license *which* or *who.*

(39) a. ??Marv put everything which he could in his pocket.

b. ??Bruce has scooped every trophy which there is.

c. ??We've talked to everyone who there is.

Given the facts in (37–39), one must draw one of two conclusions: either that relative clauses out of *there*-sentences need not be amount relatives, or that they must be a special type of amount relative. Grosu and Landman opt for the latter conclusion; McNally (1992) did the same. Let us now see why this is not viable and why instead we should conclude that the relative clause need not have an amount reading.

Grosu and Landman propose an extension of Carlson's and Heim's analyses which is designed to account for the identity of individuals condition while continuing to treat the relative clause as a species of amount relative.[14] Specifically, they, like Heim, have the clause denote in principle a unique maximal degree, but they enrich the notion of degree so that it is not simply a numerical value but rather a triple $\langle |x|, P, x \rangle$ that includes, in addition to the typical numerical value associated with a degree ($|x|$), a sortal description P (to specify what the degree is a degree of) and also a plural individual to which the degree corresponds. Although typical amount relatives when combined with the head noun denote a singleton set containing one of these degree triples, via the intervention of a special 'substance' operator on such relatives, a singleton set containing the plural individual from the triple can come to serve as the denotation of the head noun plus relative clause and yield the identity of individuals reading. Because the relative clause, whether interpreted with 'substance' or not, will always serve to identify a unique individual, Grosu

[14] Space limitations preclude a complete presentation of Grosu and Landman's analysis. I refer the reader to their paper and to McNally (2008) for additional details and commentary.

and Landman predict the unacceptability of indefinite determiners, as in (38). However, as I will discuss below, the analysis says nothing specific about the facts in (39).

But despite what the facts in (38) and (39) might suggest, there is a serious problem for the claim that only amount relatives are possible out of postverbal position in *there*-existentials, even taking into account identity of individuals as under Grosu and Landman's analysis. The problem is that the denotation of the relative clause need not determine a unique maximal individual, even though in the majority of cases it appears to do so. This can be seen in at least two facts. First, though very rare, violations are in fact attested of the condition that the determiner marking the head noun be definite or universal. Some examples found via Google appear in (40):

(40) a. For instance, they can observe that there's a difference between reasons *there are* to believe P – where these include reasons not now available to you – and reasons *you have* to believe P. For example, one reason there is to believe you'll soon be sick is the fact that you just drank poison.
(J. Pryor, 'Is There Non-Inferential Justification?', ms. Princeton U., italics original)

b. Let's start with posting a summary of the things you don't believe in, the reasons you don't believe in them, and possible reasons there are to believe in them. . . .

On all analyses of amount relatives, maximality is a key aspect of their semantics, but the facts in (40) are totally incompatible with the relative clause identifying a maximal (and therefore unique) individual.

The second fact that suggests that relative clauses out of existential sentences are not amount relatives involves modifiers such as *only* and *different* on the head noun. Both *only* and *different* systematically block the amount reading of a co-occurring relative clause, as shown in (41); nonetheless, these modifiers systematically occur with relative clauses out of *there*-sentences, as shown in (42).

(41) a. It will take us the rest of our lives to drink only the champagne they spilled that evening.

b. We will never be able to recruit the different soldiers that the Chinese paraded last May Day.

(42) a. The only kinds of reasons there are are reasons for action. . . .

b. Notice what different kinds of problems there are and can be in human life.

Grosu and Landman's semantics for amount relatives out of *there*-sentences is exactly identical to that for other amount relatives except for the application of the substance operator, which simply returns the plural individual that forms part of the degree triple instead of the entire triple. This is not the sort of difference to which *only* or *different* are going to be sensitive; what these modifiers share semantically is a felicity condition guaranteeing the nonuniqueness of the extension of the nominal they modify in the relevant possible world.[15] Thanks to maximality, amount relatives will never satisfy this nonuniqueness condition, leading to the blocking of the amount reading in (41). If *there*-sentences allowed only an amount reading, we would expect the sentences in (42) to be unacceptable. The fact that they are acceptable clearly indicates that this amount reading is not obligatory.

If we reject the idea that relatives out of *there*-sentences must be amount relatives, we must develop an alternative explanation for the restriction in (38) (to the extent that it is a fact) and (39). (38) indicates that, at least in general, there is a very strong tendency for the head noun plus relative clause out of a *there*-sentence to denote a singleton set. But this is entirely expected if the gap corresponds to the entity correlate of a property. The head noun will have to denote a property of entity correlates of properties, and these, like proper names type-shifted to properties, will generally have a unique extension. The exception will be when the head noun is something like *kind* or *type*, which denote (possibly) nonsingleton sets of entity correlates of properties. *Reason*, while not lexically restricted to this sort of denotation, demonstrably lends itself to denoting such a set. Unsurprisingly, it is precisely with such nouns that we find modifiers such as *only* or *different* and the exceptions to the restriction on the use of indefinite/nonuniversal determiners.

The unacceptability of the relative pronouns *who* and *which* illustrated in (39) is characteristic of a sortal restriction, and indeed this is what Heim (1987) suggests: she posits that the exclusion of *who* and *which* is due to the fact that the relative clause denotes a degree. Since I reject the idea that the relative clause must denote a degree (though nothing should prevent that from being an option in whatever cases are conducive to amount readings), there must be some other sortal restriction involved. I argued in McNally (1992) that this restriction follows directly if the gap in postverbal position corresponds to a property or its entity correlate under the assumption that relative *who*, *which* are sortally restricted to particulars. Such a restriction is supported, for

[15] See McNally (2008) for a full characterization of this condition.

example, by the oddness of such relative pronouns when the gap in the relative clause corresponds to a predicate nominal:

(43) a. ??They didn't recognize the kind of vase which it was.
b. They didn't recognize the kind of vase (that) it was.
c. ??His parents were unhappy with the man who he had become.
d. His parents were unhappy with the man (that) he had become.

Thus, the 'instantiate' semantics for *there*-sentences provides for an analysis of relatives out of postverbal position where an amount relative analysis fails. Let us now consider how an 'exist' semantics coupled with DKP or semantic incorporation/Restrict would handle these facts.

What is most crucial to any analysis that builds on an 'exist' semantics is to account for the (near) obligatoriness of the facts: that definite determiners are almost always found, that indefinite determiners sound odd except when the postverbal nominal plausibly denotes a nonsingleton set of properties of properties, and that the relative pronoun is required to be *that* or null. If we adopt the DKP analysis, for example, we would have to posit that DKP is obligatory with *there*-existentials; otherwise, we would expect relative clauses out of existentials to behave like relative clauses out of any other ordinary argument position. But DKP as a rule does not appear to be subject to lexical selection: predicates over particulars quite systematically allow the possibility of saturating their argument positions with kind-denoting expressions, but I know of no proposal on which this is the *only* possibility. Indeed, to propose that a predicate must combine with its argument via DKP is empirically indistinguishable from proposing that it lexically selects for an entity correlate of a property. In contrast, cases of obligatory semantic incorporation and Restrict have been argued for by Geenhoven (1998) and Chung & Ladusaw (2004), respectively; thus, a Restrict analysis could account for facts like these which ultimately involve sortal restrictions associated with a particular argument position.

Summarizing the data in the previous two sections, I conclude that while, in general, no single fact argues conclusively for one analysis of the *there*-existential predicate over another, taken together the facts support the claim that the predicate denotes a property of entity correlates of properties.

7.5 The typology of semantic variation in existence statements

The results of the previous sections can be distilled into the following table, which indicates how we can distinguish empirically between two very similar

semantics for existence statements on which the predicate obligatorily combines with an argument that does not correspond to a particular.

Predicate semantics	Categorial restriction to DP	Quantification over relevant argument	Restriction to 'amount-like' relatives or other selectional restrictions
'exist' + obligatory SI/Restrict	DP excluded	No	Yes
'instantiate'	Yes	Possible	Yes

In addition, we can add two further possibilities: an 'exist' semantics which optionally allows the predicate to combine with a kind-denoting argument via DKP, and one which optionally allows the predicate to combine with a property-qua-function argument via semantic incorporation or Restrict. Some languages might allow both of these options. When one or both of these options exist, there should be no restriction to 'amount-like' relatives or other sorts of selectional restrictions, nor should there be any restriction on quantification over the postverbal argument – quantification over any sort of individual that can serve as the argument to the existence predicate should be licensed. In a language where semantic incorporation or Restrict is an option, we would expect to find the possibility of bare singulars in the relevant argument position; if this option isn't available, we would expect to find no bare singulars.

We do not have to look far to find cross-linguistic and within-language evidence which suggests that all of these possibilities are attested. First, a consideration of the sorts of facts discussed above serves to confirm the analysis of the Chamorro existential predicates *guäha* 'exist' and *taya*' 'not exist', for which Chung and Ladusaw defend an obligatory Restrict analysis (interestingly enough, largely on grounds other than those discussed here). These predicates differ from most other verbs in Chamorro in allowing bare singular nominals as arguments (Chung (1987), Chung & Ladusaw (2004: 87)):[16]

(44) a. *Mattu taotao gi petta.
Agr.arrive person Loc door
('A man appeared in the doorway.')
(Chamorro, Chung (1987: 193))

[16] The abbreviations in the glosses have been modified slightly to remove inconsistencies between those used in Chung (1987) and Chung & Ladusaw (2004).

b. *Ha-sodda' si Juan yommuk na patgun gi me'nan
Agr.find Unm Juan fat L[17] child Loc front-L
iya siha.
their-place
('Juan found a fat child in front of his (lit. their) house.')
(Chamorro, ibid.)

c. Guäha taotao mattu gi petta.
Agr.exist person Agr.arrive Loc door.
'There was a man (who) appeared in the doorway.'
(Chamorro, Chung (1987: 194))

d. Taya' lahi t-um-aitai i lepblu.
Agr.not.exist boy Agr(*wh*).read the book
'There was no boy (who) read the book.' (Chamorro, ibid.)

Moreover, these predicates do not permit quantification over properties or kinds (Chung & Ladusaw (2004: 98 and chapter 3, fn. 5)).

(45) *Taya' todu klasi-n hugeti-ña si Joe.
Agr.not.exist all sort-L toy-Agr Unm[18] Joe
(Lit. 'There aren't all sorts of toys of Joe's.')
(Chamorro, Chung & Ladusaw (2004: 98))

Finally, according to Chung (1987: 199f.) these predicates manifest in questions the same sortal restriction found with relativization (and to a lesser extent, with questions) out of *there*-existentials:

(46) a. Hafa guäha gi hälum kahun áis?
what? Agr.exist inside box ice
'What is there inside the icebox?' (Chamorro, Chung (1987: 194))

b. Kuantu na buteya guäha gi hälum kahun áis?
how-many? L bottle Agr.exist inside box ice
'How many bottles are there in the icebox?'
(Chamorro, Chung (1987: 199))

c. *Hayi guäha gi kusina?
who? Agr.exist Loc kitchen
('Who is there in the kitchen?') (Chamorro, Chung (1987: 200))

This is exactly the array of facts expected if *guäha* and *taya'* denote properties of particulars but only combine with their arguments via Restrict or semantic incorporation.

[17] L – Linker.
[18] Unm – unmarked morphological case.

West Greenlandic appears to be similar. van Geenhoven observes that adjectives, numerals and verbs can incorporate (though she also has mentioned in personal communication that the adjective/noun distinction is not very easy to draw in the language).

(47) Angut marlu-raar-p-u-q.
man.abs two-catch-ind-[-tr]-3sg
'The man caught two.'
(W. Greenlandic, Geenhoven (1998: 15), ex. due to Sadock)

Similarly, Geenhoven (1998: 45) notes that she had trouble getting her informants to accept the following example.[19] She attributes the problem to pragmatics, but it is hard to see what pragmatic problem there could be with this sentence:

(48) Juuna tama-nik atuagar-si-v-u-q.
J.abs all-inst.pl book-get-ind-[-tr]-3sg
'Junna got all kinds of books.'
(W. Greenlandic, Geenhoven (1998: 45))

The patterns of data represented in the table coupled with facts such as those in (49) lead to a different analysis for Maori, a language for whose existential construction Chung & Ladusaw (2004) also propose a Restrict analysis. Chung and Ladusaw argue that nominals marked by the determiner *he* in Maori are special in requiring composition via Restrict; the Maori existential construction is peculiar in generally requiring *he*-indefinites and excluding indefinites marked with the determiner *tētahi*, which they claim combines with predicates via ordinary function application.

(49) a. Kāhore he taniwha.
T.not a taniwha
'There are no taniwhas.' (Maori, Chung & Ladusaw (2004))

b. *Kāhore ētahi taniwha.
T.not a.pl taniwha.
('There are no taniwhas.') (Maori, Chung & Ladusaw (2004: 44))

Müller-Reichau (2005) argues for an alternative view of the facts. Starting from Chierchia's position that the function of determiners is to convert property-qua-function-type expressions into their entity correlates, Müller-Reichau argues for analysing *he*-nominals as obligatorily denoting entity correlates

[19] van Geenhoven attributes this example to personal communication from M. Bittner. It is unclear from van Geenhoven's text whether Bittner's informants accepted the example or not.

of properties.[20] This denotation will generally force them to undergo DKP, an analysis which is very similar to one on which they obligatorily undergo Restrict. He further proposes that the Maori existential predicate selects specifically for entity correlates of properties, i.e. that it has an 'instantiate' semantics, as I have argued for *there*-sentences. This latter analysis is further supported by the fact that the otherwise excluded determiner *tētahi* is attested precisely with a kind nominal, as shown in (50):

(50) Ka kai a au i te mātene mehemea anake kaore tētahi
T eat Pers I DO the mutton if only T.not a
atu momo mīti.
away kind meat
'I only eat mutton if there is no other kind of meat available.'
(Maori; ibid., 156)

Chung and Ladusaw do not offer a quantificational analysis of *tētahi*, so we cannot be sure that (50) illustrates quantification over kinds. However, we can easily account for the facts by positing that semantic effect of *he* is to convert properties of particulars into entity correlates of properties or kinds, while *tētahi* does not. Suppose, as do Chung and Ladusaw, that *tētahi* nominals denote the value of a choice function which selects an element from the nominal's extension. Only if that extension includes nonparticulars, as in (50), should a *tētahi* nominal be acceptable in an existential sentence. The acceptability of (50) is less easily explained on the Restrict analysis, for the reasons discussed in section 7.3.2.

The English verb *exist*, though a prosaic example, is arguably a predicate that lexically selects for particulars and allows optionally for kind-type arguments via DKP but not for semantic incorporation or Restrict. We have already seen (in (7b)) that *exist* allows for quantification over particulars. It allows for quantification over nonparticulars as well ((51a)), imposes no selections restrictions like those related to relative clause formation out of *there*-existentials ((52b,c)), and does not permit a bare singular argument ((52d)):

(51) a. That kind of telephone in fact exists.
b. I want to meet the magician who really exists.
c. You must bridge the gap which exists between the two groups.
d. *Solution exists.

[20] Müller-Reichau suggests that additional support for his analysis comes from the fact that *he*-nominals are used in generic sentences as well, as would be expected on a (neo)Carlsonian analysis of such sentences.

Finally, the Catalan existential predicate *haver-hi* appears to have an 'exist' semantics and allows optional combination with a bare singular via semantic incorporation in addition to combination with a kind term via DKP. Although definite DPs are systematically licensed in Catalan existentials, quantificational DPs are quite restricted. Still, one finds cases such as (52a) whose analysis is not entirely clear but which do not intuitively involve quantification over kinds, which is illustrated in (52b).

(52) a. Hi ha cada element que dóna classes com a professor
there have each element that gives classes as professor
que no vegis.
that no see.2sg
Roughly: 'You wouldn't believe the individuals you find teaching classes.' (Catalan)

b. Hi ha tota mena d'informació sobre les illes....
there have all kind of-information about the islands
'There's all kinds of information about the islands....' (Catalan)

Moreover, (53) shows that ordinary restrictive relatives can be constructed out of *haver-hi* clauses:

(53) Vaig pujar a... la urbanització que hi ha a la
go.1sg go-up.inf to the development that there have to the
muntanya....
mountain....
'I went up to the development that (there) is on the mountain.'
(Catalan)

Finally, in (54) we see examples of how bare singulars can appear in Catalan existentials.

(54) a. A l'hotel hi ha acensor.
to the-hotel there have elevator
'The hotel has (an) elevator.' (Catalan)

b. Demà hi ha examen.
tomorrow there have exam
'Tomorrow there is (an) exam.' (Catalan)

Though subject to certain lexical restrictions, the use of bare singulars is not limited to strictly idiomatic expressions and is at least partially productive,

indicating that an active compositional mechanism is necessary to account for the data in (54).[21]

7.6 Conclusions

I have argued that, even within the family of property-based analyses of existence statements, there is room for semantic variation, and I have pointed to various candidate realizations of these semantic options. For *there*-sentences in particular, I have argued that the analysis proposed in McNally (1992) is superior to a semantic incorporation analysis of the sort suggested in McNally & Geenhoven (1998) and in other works.

Revindicating a role for entity correlates of properties outside the realm of typical generic sentences raises various theoretical issues. The most difficult – and one which will have to be addressed on a future occasion – is how best to distinguish a proper subsort of kinds within the entity correlates of properties. However, the insights I hope to have gained into the semantics of existence statements have depended heavily on Chierchia's three-layer hypothesis and on his vision of the role of determiners in converting properties into viable semantic arguments. Further work will also be necessary to determine to what extent these assumptions are independently justifiable.

[21] I am grateful to Maria Teresa Espinal for discussion of the Catalan data, though this is not to imply that she necessarily agrees with the analysis suggested here. See Espinal & McNally (2007) for an analysis of bare singular nominals in Catalan existential sentences in which a version of Dayal's pseudo-incorporation, rather than van Geenhoven-style incorporation, is used. The *raison d'être* for this option between ordinary function application and incorporation in Catalan appears to be related to the phenomenon which underlies the kind of direct object marking and case marking facts discussed in de Hoop (this volume).

8

Stability and variation in article choice: generic and non-generic contexts

DONKA F. FARKAS AND HENRIËTTE DE SWART

8.1 Introduction

In Farkas and de Swart (2007), we proposed an analysis of the cross-linguistic variation in article choice in plural generics. In this chapter we develop an extended version of the analysis which accounts for cross-linguistic stability in article choice in non-generic contexts and in singular generics in languages with definite and indefinite articles, such as English, Dutch, French, Spanish, Greek, and Hungarian. Before we present the empirical puzzle, we clarify a terminological matter. As is made clear in 8.2.4 below, we assume a fair-grained syntactic treatment of nominal projections that distinguishes between DPs (headed by D), nominals that project to the NP level (bare singulars), and nominals that project up to the Num(ber) P(hrase) level (bare plurals). Since we are not concerned with bare singulars here, we will use the term NP below as an umbrella term for all types of nominals.

Definite NPs are uniformly used with unique (or maximal) referents, such as (1), and familiar referents, whether singular (3) or plural (4). We exemplify with English (E), French (F), and Hungarian (H):

(1) a. The moon is shining. E

b. La lune brille. F
the moon shines

c. A hold csillog. H
the moon shines

(2) a. The stars are shining. E

b. Les étoiles brillent. F
the stars shine

c. A csillagok csillognak. H
the star.Pl shine.Pl

(3) a. A man and a child came in. The man was tall. E

b. Un homme et un enfant entraient. L'homme était grand. F
A man and a child came-in. The man was tall.

c. Bejött egy férfi és egy gyerek. A férfi magas volt. H
in.com.Past a man and a child the man tall was

(4) a. Children and dogs were playing in the street. The children were noisy. E

b. Des enfants et des chiens jouaient dans la
Indef-pl children and indef-pl dogs played in the
rue. Les enfants faisaient du bruit. F
street. The children made indef-mass noise.

c. Gyerekek és kutyák játszottak az utcán. A gyerekek
child.Pl and dog.Pl play.Past.Pl the street.on the child.Pl
hangosak voltak. H
noisy.Pl were.Pl

In Hungarian and English, bare plural forms are used with existential indefinite interpretations as in (4a,c) while in French the indefinite plural article *des* (4b) is used. Bare plurals and *des* NPs share many syntactic and semantic properties, as shown by Bosveld-de Smet (1998). For the purposes of this chapter, they will be treated uniformly as indefinite plural forms. We thus conclude that the languages under consideration do not differ significantly with respect to definiteness in non-generic contexts.

The parallelism just noted breaks down in generic environments, however. The term 'generic environment' covers both sentences expressing direct kind reference and those involving generic generalizations. Both singular and plural forms are used in the languages under consideration in these environments. With singular NPs, the parallelism is maintained: the definite article is consistently used for direct kind reference, as in (5), and the indefinite article is used in generic generalizations, as in (6):

(5) a. The dinosaur is extinct. E

b. Le dinosaure a disparu. F
The dinosaur has disappeared.

c. A dinoszaurusz kihalt. H
The dinosaur die.out.Past

(6) a. A dog is dangerous when it is hungry. E

b. Un chien est dangereux quand il a faim. F
a dog is dangerous when it has hunger

c. Egy kutya veszélyes mikor éhes. H
a dog dangerous when hungry

Differences arise, however, in the plural case, where our languages fall into two groups: (i) English-type languages, which use *indefinite (bare) plural* forms in generic environments, and (ii) Hungarian, Greek, and Romance languages, which use *definite plurals*. We add a few more languages to show the consistency in the pattern for direct kind reference (7) and generic generalizations (8):

(7) a. Dinosaurs are extinct. E

b. Dinosaurussen zijn uitgestorven. Dutch
Dinsosaurs are extinct.

c. Les dinosaures ont disparu. F
The dinosaurs have disappeared.

d. A dinoszauruszok kihaltak. H
the dinosaur.Pl die.out.Past.Pl

e. Dinosaurii au dispărut. Romanian
Dinosaur-def has disappeared.

f. Gli elefanti di colore bianco sono estinti. Italian
The elephants of colour white are extinct.

g. Oi asproi elephantes echoun exaphanistei. Greek
The white elephants are extinct.

(8) a. Dogs are dangerous when they are hungry. E

b. Honden zijn gevaarlijk wanneer ze honger hebben. Dutch
Dogs are dangerous when they hunger have.

c. Les chiens sont dangereux quand ils ont faim. F
The dogs are dangerous when they have hunger.

d. A kutyák veszélyesek mikor éhesek. H
the dog.Pl dangerous.Pl when hungry.Pl

e. Cîinii sînt intelegenţi. Romanian
Dog.Pl.Def are intelligent.Pl.

f. Gli ucelli di zone paludose sono intelligeni. Italian
the bird.Pl from zone.Pl marshy.Pl are intelligent.

g. Ta skillia einai eksipna. Greek
the dog.Pl are intelligent.Pl

The contrast just noted between definite and indefinite generics is sometimes related in the literature to the contrast between Romance and Germanic languages, but the fact that typologically unrelated languages such as Hungarian and Greek pattern with Romance indicates that we are dealing with a more widespread phenomenon. Since the cross-linguistic variation is restricted to plural generics, the correct account must locate the source of variation in the combination of plurality and genericity. The overall analysis of genericity, of the definite/indefinite contrast, and of the singular/plural distinction should be the same from one language to the next, so as to explain the cross-linguistic stability in article choice in non-generic contexts and singular generics.

Farkas & de Swart (2007) focused on cross-linguistic variation in definiteness found in generic plural forms. Our aim here is to explain the cross-linguistic stability we find in the case of singular generics while maintaining the earlier account of the contrasts in the plural. To complete the account of cross-linguistic stability in article choice we extend the analysis of article choice in non-generic contexts sketched in the earlier work.

The structure of the chapter is as follows. In section 8.2, we summarize the analysis in Farkas & de Swart (2007) of the cross-linguistic contrast in article choice in plural generics. In section 8.3, we discuss non-generic contexts, and account for cross-linguistic stability in article choice in these environments. In section 8.4, we pick up the line of genericity, focusing on singular, rather than plural generics, and show why the factors that give rise to cross-linguistic variation in the plural case are irrelevant for the singular. Section 8.5 is a brief conclusion.

8.2 Article choice in plural generics

As mentioned above, we take the cross-linguistic variation in article choice in plural generics to arise from the combination of plurality and genericity. In section 8.2.1 through 8.2.3, we outline our background assumptions on number, the definite/indefinite contrast, and genericity that allow us to explain what is so special about plural generics. Section 8.2.4 relates the semantics to the syntax, and develops an Optimality Theoretic (OT) analysis of article choice in plural generics.

8.2.1 *Background on number*

Even sketching a comprehensive theory of number interpretation would take us too far afield but since number is crucially involved in our analysis we

list here some basic assumptions. First, we take it that singular nominals are semantically and morphologically unmarked for number, while plural nominals are morphologically marked by the feature [Pl], which causes them to be semantically marked as well.[1] The main advantage of this assumption in our view is that it preserves the desired parallelism between semantic and morphological marking.

In DRT terms, the effect of the presence of the feature [Pl] is to introduce a presupposed discourse referent that gets the predicate Pl(ural) predicated of it, thereby imposing the requirement that its value be chosen among the sums of the model. We adopt a standard organization of the domain of individuals in terms of a join semilattice (Link (1983)). In static terms, our semantics of plurality amounts to treating the denotation of [Pl] as being $\lambda x.\ x \in \text{Sum}$.[2] We also assume here that NPs that lack the feature [Pl] get an atomic interpretation in languages with morphological plural marking (treated in 8.2.4 as high-ranked FPl (Faith Plurality)). Exactly how this is accomplished is a non-trivial issue closely connected to the way one deals with the problem of inclusive plurals mentioned in footnote 2. These issues are, however, tangential to our main point because the only thing that matters for present purposes is the uncontroversial fact that singular NPs get atomic interpretations, while NPs marked by the feature [Pl] get a sum interpretation unless special factors intervene.[3]

8.2.2 *Background on the definite/indefinite contrast*

For present purposes, we take an NP to be definite when it is preceded by the definite article and indefinite if preceded by an indefinite article or if it is a bare plural. We follow Farkas (2002) and references therein in taking the definite to be the marked member of the pair, and the indefinite the unmarked member.

[1] For a defence of this view, see Farkas & de Swart (2003) and Farkas (2006). Spector (2007) treats singulars as morphologically unmarked as well, though without discussion; for the opposite proposal, see Sauerland et al. (2005).

[2] The major problem such an analysis faces is the existence of *inclusive plurals*, exemplified by the question in (i), which is answered affirmatively even in the case the addressee has a single child:

(i) A: Do you have *children*?
B: Yes, I have one.

There are various ways of addressing this problem in the literature while maintaining the semantically marked nature of plural forms but none of the solutions crucially affect the points made in this chapter and therefore we will not go into this matter any further.

[3] A complex and interesting issue any theory of number has to face is the interaction of plural morphology with mass nouns, but this matter is not relevant to anything that follows, and therefore we do not address it here. We also leave out of the discussion the issue of number interpretation in cases of incorporated NPs.

Just as in Farkas (2002), we characterize the semantic contribution of the definite article to be the marking of determined reference on the discourse referent it introduces. In the semantic representation we mark the contribution of the definite article by !. Determined reference (or dynamic uniqueness) concerns the question of choice of value for a referent at the point of update. A discourse referent x introduced by an NP has determined reference relative to an input function f and a model M iff for every f', f'' that are output functions satisfying the descriptive content of the DP, $f'(x) = f''(x)$. The special marking for determined reference is motivated by topicality or discourse prominence (de Hoop (this volume)), which emphasizes the relevance of context and salience for both maximality and uniqueness. Determined reference can be achieved in two ways: (i) uniqueness/maximality relative to the context and the descriptive content of the NP; (ii) anaphoric dependency on a discourse referent in the input DRS. Connecting these two factors is crucial in getting at the common denominator of ordinary definite descriptions and definite pronouns.

We can see determined reference at work in the examples in (1)–(4) from section 8.1. In examples (1) and (2), world knowledge tells us that there is a unique relevant moon and a finite set of stars in our solar system, which are referred to by the definite *the moon* and *the stars.* In examples (3) and (4), the indefinites in the first sentence set up discourse referents that are then picked up by means of the definite expressions *the man* and *the children* in the second sentence. The familiarity of the referents of these definites is crucial in their achieving determined reference, while, in the case of the moon and the stars, this is not so.

We distinguish these two ways of achieving determined reference by means of the features [±*Max*] and [±*Fam*] on the discourse referent. A discourse referent marked as [+*Max*] must have unique reference relative to the input DRS if it is atomic; it must have maximal reference if it is plural. A discourse referent characterized as [+*Fam*] must be present in the input DRS or accommodatable therein. For convenience, we will say an NP is maximal or familiar when the discourse referent the NP introduces is maximal or familiar respectively.

The status of the definite as the marked member of the pair implies a weak semantics of the indefinite as unmarked for definiteness, with non-uniqueness and novelty of indefinites arising as an implicature (de Swart (2006), Farkas (2006)), which is suspended in certain contexts (cf. section 8.4.1 below).

8.2.3 *Background on genericity*

As far as genericity is concerned, we distinguish between direct reference to kinds (examples in 5 and 7) and generic generalizations (examples in 6 and 8),

along the lines of Carlson (1977b), Krifka et al. (1995), and others. With respect to singular generics, we follow Carlson's original insight in treating the definite singular in (5) as referring to a special atom *k* in the model, one that is kind-level and unique. With respect to kind-referring plural generics, we follow Ojeda (1993), Chierchia (1998a), and Dayal (2004) in assuming that plural kinds involve the sum of their instantiations across different worlds and situations. So the definite singular in (5) gets the representation in (9a). Bare plurals and definite plurals in sentences expressing direct kind reference get the representations in (9b) and (c) respectively:

(9) a. $\exists!k\,(\text{Dinosaur}(k) \,\&\, \text{Extinct}(k))$ definite sg kind reference

b. $\exists K\, K = \Sigma_{x,w}\,(\text{Dinosaur}(x,w) \,\&\, \text{Plural}(K) \,\&\, \text{Extinct}(K))$ bare pl kind reference

c. $\exists!K\, K = \Sigma_{x,w}\,(\text{Dinosaur}(x,w) \,\&\, \text{Plural}(K) \,\&\, \text{Extinct}(K))$ definite pl kind reference

Σ operates on individual (non-kind) level entities in different worlds and sums them up into their kind. The entity that results after application of Σ is the top node of the intensional lattice associated with the descriptive content of the NP. We denote it by *K* to distinguish it from ordinary atomic kinds *k* (which can form their own hierarchical structures in taxonomic interpretations). Kind-level predicates like *to be extinct* are insensitive to the difference between atomic kinds (*k*) and derived kinds (*K*), as illustrated by the felicity of both (5) and (7). The atomic kind in (9a) is unique. In the singular, the fact that the discourse referent has determined reference is reflected in the use of the definite article, which induces the exclamation mark ! that follows the existential quantifier. The semantics of the sum operator confers maximality on the plural kinds in (9b) and (9c) as well. Romance and Hungarian reflect the determined reference of the discourse referent in the use of the definite article, which induces the exclamation mark ! in (9c). English and Dutch do not reflect the determined reference of the discourse referent, and use a bare plural, which does not induce an exclamation mark in (9b).

We follow de Swart (1991) and de Swart (1996) in treating the indefinite singular in generic generalizations like (6) and (8) as an ordinary indefinite, introducing a discourse referent *x* that is indirectly bound by a silent generic operator Gen binding dog-sized situations. The semantics of generic generalizations involving singulars (as in 6) is given in (10a). The representation of bare plurals and definite plurals in generic generalizations is given in (10b) and (c) respectively:

(10) a. Gen_s ((∃x Dog(x,s) & Hungry(x,s)), Dangerous(x,s))
indef sg in GG

b. Gen_s ((∃x Dog(x,s) & Plural(x) & Hungry(x,s)), Dangerous(x,s))
bare pl in GG

c. Gen_s ((∃!x Dog(x,s) & Plural(x) & Hungry(x,s)), Dangerous(x,s))
definite pl in GG

Indirect binding arises when each situation *s* involves its own instance of the discourse referent *x*. In such a context, we have as many (typical) situations with a (typical) dog in them as we have (typical) dogs. As a result, indirect binding is indistinguishable from unselective binding (Farkas & Sugioka (1983), Krifka et al. (1995), and others), as far as truth conditions are concerned. In the plural case (10b,c), a hidden distribution operator guarantees that predication over the plural entity percolates down to the level of the atomic members of the plural individual. In order to keep the semantic representations as simple and transparent as possible, the particularities of this mechanism are not spelled out. The only difference between (10b) and (10c) is the visibility of determined reference in the semantics of the definite (Romance, Hungarian) generic plural in (10c), versus the invisibility of determined reference in the bare (English, Dutch) generic plural in (10b).

8.2.4 *OT analysis of article use in plural generics*

In Farkas & de Swart (2007), we argue that the general definite/indefinite contrast cannot be made responsible for article choice in plural generics, because English/Dutch and Romance/Hungarian behave very similarly as far as the use of definite and indefinite articles in non-generic contexts is concerned. We can embed this observation in the typological theory of definiteness and number developed by de Swart & Zwarts (2008). In this analysis, the interaction of three faithfulness constraints and two markedness constraints determines which distinctions get expressed in a language. The constraints used are the following:

- FPl: parse plurality by means of a NumP.
- FDef: parse determined reference.
- Fdr: parse a discourse referent by means of a functional layer above NP.
- *Art: avoid article.
- *FunctN: avoid functional structure in the nominal domain.

The constraint interaction is used as a generation model in OT syntax. We assume the syntactic structure [DP [NumP [NP]]] for full DPs. All nominals project at least an NP, but the functional levels NumP and DP are only

projected with overt material. If all the faithfulness constraints are ranked below the markedness constraints *Art and *FunctN, no number and definiteness distinctions are expressed. If one or more faithfulness constraints are ranked above the markedness constraints, the OT syntax produces nominals with functional layers (NumP and/or DP). In this chapter, we are interested in languages that have a full definiteness/indefiniteness contrast, as well as a singular/plural distinction. In such languages, all the relevant faithfulness constraints are ranked above the two markedness constraints, resulting in the ranking {FDef, Fdr, FPl} >> {*Art, *FunctN}.

According to Farkas & de Swart (2007), the constraints in de Swart & Zwarts (2008) are not sufficient to determine article use in plural generics. The similarities between Romance, Hungarian, Greek, on the one hand, and English, Dutch, on the other hand, in non-generic contexts (examples 1–4 in section 8.1) and in singular generics (examples 5 and 6) can be accounted for under the assumption that the grammar of all these languages involves the ranking {FDef, Fdr, FPl} >> {*Art, *FunctN}. But how would this grammar account for the divergence in article use in generic plurals (examples 7 and 8)?

A possibility that arises is to relate the use of the definite article in Romance/Hungarian/Greek bare plurals to the constraint FDef. FDef is a faithfulness constraint that requires the output syntactic form to reflect the determined reference nature of the discourse referent, militating for the use of a definite article in the case of determined reference. We observe that the discourse referent in plural generics has determined reference because of the analysis of genericity we assumed in section 8.2.3 above. Both the sum operator (Σ) and the Gen operator confer maximality upon the plural discourse referent, so the discourse referent has determined reference. Because of the high ranking of FDef in Romance/Hungarian/Greek as well as English/Dutch, we should see a reflection of this in the syntactic form. However, if we take determined reference to trigger the use of the definite article in plural generics in Romance/Hungarian/Greek (7c–g, 8c–g), we are left with no explanation for the bare generic plurals in English/Dutch (7a–b, 8a–b). If we assume that FDef is somehow independently satisfied, and has nothing to do with article choice in plural generics, we might appeal to *Art to explain why generic plurals remain bare in English/Dutch (7a–b, 8a–b). However, this means that the use of the definite article in Romance/Hungarian/Greek (7c–g, 8c–g) is not accounted for. We conclude that we need the constraint setting advanced in de Swart & Zwarts (2008) to account for the similarities in article selection in non-generic contexts and singular generics, but we need an additional mechanism to account for the divergences of article selection in plural generics.

The key insight formulated by Farkas & de Swart (2007) is that FDef is independently satisfied in plural generic contexts. The cross-linguistic variation is captured by exploiting the maximality and familiarity components of the definite article. We take it that the genericity of sentences involving Σ or Gen is marked in the syntax, and parses determined reference. Given that either Σ or Gen is always present in plural generic contexts, according to the analysis of genericity outlined in section 8.2.3, FDef is automatically satisfied in examples like (7) and (8) in all the languages under consideration. But if FDef is satisfied by the presence of Σ or Gen, it does not govern article choice in plural generics, and other constraints must come into play to account for the cross-linguistic diversity in these contexts. Farkas & de Swart (2007) observe that, in plural generics, the two components of determined reference, namely maximality and familiarity, are in conflict: the discourse referent of the plural generic nominal in sentences like (7) and (8) always has the feature configuration [+Max] [−Fam]. It is [+Max], because Σ or Gen confers maximality upon the discourse referent. It is [−Fam] in generic generalizations, because variables (in)directly bound by an operator are never familiar (Kamp & Reyle (1993)). The discourse referent is [−Fam] in direct kind reference, because of the intensional nature of Σ. The fact that the discourse referent corresponding to the plural generic nominal is always maximal, and never familiar, suggests that the two parameters of determined reference are independent in this context. We capture the two aspects of determined reference in the two constraints (11) and (12):

(11) *MaxMax:* Maximize maximality features of the discourse referent by reflecting them in the nominal projection.

(12) **Def/[−Fam]:* Avoid non-familiar definites.

MaxMax is a faithfulness constraint that requires a maximal discourse referent to be introduced by an NP with a definite article, even if determined reference is already reflected in Gen or Σ. It is more specific than FDef: satisfaction of MaxMax entails satisfaction of FDef, but not the other way around. *Def/[−Fam] is a markedness constraint that penalizes the use of a definite article with non-familiar discourse referents. It is also more specific than FDef, because it only comes into play in languages that have a definite/indefinite contrast. These two constraints govern the choice of a definite or an indefinite form based on the semantic properties of the discourse referent. The constraints in (11) and (12) are assumed to be universal. The contrast of interest here is due to different orderings of the two constraints:

FDef >> *Def/[−Fam] >> MaxMax >> *Art [English, Dutch]

FDef >> MaxMax >> *Def/[−Fam] >> *Art [Romance, Greek, Hungarian]

In plural generic contexts, FDef is satisfied by the sum operator or the generic operator, and therefore FDef is always satisfied in all the languages under consideration. We know that the plural discourse referent in direct kind reference as well as generic generalizations has the feature configuration [+Max][−Fam]. MaxMax favours the use of a definite article, whereas *Def/[−Fam] penalizes it. Thus, the two constraints conflict in environments involving plural generics. The ranking MaxMax >> *Def/[−Fam] guarantees that languages like Romance, Greek, and Hungarian use definite plural generics. The ranking *Def/[−Fam] >> MaxMax entails that English and Dutch use non-definite (bare) plural generics. For generic generalizations, this is reflected in the following tableaux:

Tableau 8.1 Indefinite plural generic generalizations (illustrated with English)

Meaning Gen_x(Dog(x),Pl(x)),Intel(x)) [+Max] [−Fam]	Form	FDef	*Def/−fam	MaxMax	*Art
☞	Dogs are intelligent			*	
	The dogs are intelligent		*		*

Tableau 8.2 Definite plural generic generalizations (illustrated with French)

Meaning Gen_x(Dog(x),Pl(x)),Intel(x)) [+Max] [−Fam]	Form	FDef	MaxMax	*Def/−fam	*Art
	Des chiens sont intelligents		*		*
☞	Les chiens sont intelligents			*	*

We call languages like English 'high familiarity' languages, because they block the definite article in plural generics. Romance, Hungarian, and Greek are 'high maximality' languages, because they reflect the maximal nature of the

discourse referent in the use of the definite article, even though determined reference is already parsed by the generic construction. Our approach thus accounts for the intuition that the definite article of plural generics is semantically redundant. The OT analysis makes strong predictions as to article use in sentences expressing pseudo-genericity and anaphoric genericity. The interested reader is referred to Farkas & de Swart (2007) for details.

The account of plural generics just given raises two important questions that were not addressed in Farkas & de Swart (2007):

- Is article use in non-generic contexts affected by the introduction of the new constraints MaxMax and *Def/[−Fam]?
- Is article use in singular generics affected by the introduction of the new constraints MaxMax and *Def/[−Fam]?

Given the similarities in article use in non-generic contexts between English/Dutch on the one hand, and Romance/Hungarian on the other, the answer to both questions should be 'no'. Sections 8.3 and 8.4 show how we reach these answers, and therefore how we account for cross-linguistic stability in article use in non-generic and singular generic generalizations across the languages we study.

8.3 Article choice in non-generic contexts

In Farkas & de Swart (2007), we suggested that the ranking {FPl, Fdr, FDef} >> *Art accounts for the similarities in article use in non-generic sentences in English/Dutch and Romance/Hungarian. (13) through (15) repeat the relevant examples from section 8.1 above:

(13) a. The moon is round. The stars are shining. E

b. La lune est ronde. Les étoiles brillent. F
The moon is round. The stars shine.

c. A hold kerek. A csillagok csillognak. H
the moon round the star.Pl shine.Pl

(14) a. A man and a child came in. The man was tall. E

b. Un homme et un enfant entraient. L'homme était grand. F
A man and a child came-in. The man was tall.

c. Bejött egy férfi és egy gyerek. A férfi magas volt. H
in.com.Past a man and a child the man tall was

Tableau 8.3 Familiar non-generic definites in 'high familiarity' languages (illustrated with English for the second sentence of 14a)

Meaning man(x) [+Max] [+Fam]	Form	FDef	*Def/−fam	MaxMax	*Art
	a man	*		*	*
☞	the man				*

(15) a. Children and dogs were playing in the street. The children were noisy. E

b. Des enfants et des chiens jouaient dans la
Indef-pl children and indef-pl dogs played in the
rue. Les enfants faisaient du bruit. F
street. The children made indef-mass noise.

c. Gyerekek és kutyák játszottak az utcán. A gyerekek
child.Pl and dog.Pl play.Past.Pl the street.on the child.Pl
hangosak voltak. H
noisy.Pl were.Pl

In section 8.2.2 above, we argued that all the definite NPs in these examples have determined reference. Some achieve determined reference through uniqueness/maximality in the larger context, as in (13), while others achieve it through anaphoric reference to a discourse referent introduced earlier in the discourse, as in (14) and (15). This is the interpretive perspective. Under the generative perspective, we see that the constraint ranking FDef >> *Art requires parsing determined reference. If the construction is not marked as generic, the only way for an N-headed nominal to satisfy the constraint FDef is by the use of a definite article. In non-generic contexts there is no conflict between the maximality and familiarity features of the relevant discourse referent. That is, the definite singulars and plurals in (13)–(15) are maximal (or unique) as well as familiar. The use of a definite form satisfies FDef as well as *Def/[−Fam] and MaxMax. We therefore predict the use of a definite form across the languages under consideration in these cases, given that the only relevant difference between the grammar of English/Dutch on the one hand and Romance/Hungarian on the other is the ranking of the constraints *Def/[−Fam] and MaxMax.[4] This is illustrated for English in Tableau 8.3.

[4] Thanks to Larry Horn for pointing out problems with an earlier version of our analysis (see de Swart & Farkas (2005), and discussion in Horn (2005)).

The result of the competition between definite and indefinite forms in non-generic contexts is identical in Romance/Hungarian, because of the high ranking of FDef in both language groups. Now, corpus research has shown that definites in English texts frequently introduce discourse new entities (Poesio & Vieira (1998)), as in:

(16) a. Fleet Street has been buzzing with the rumour that the prime minister is going to resign.

b. The first person to sail to America was an Icelander.

We find the same pattern in Romance/Hungarian:

(17) a. A hír, hogy Mari beteg ijesztő. H
the rumour that Mari sick frightening
'The rumour that Mari is sick is frightening.'

b. A legjobb diákom Magyarországról jött.
the best student.my Hungary.from came
'My best student came from Hungary.'

Ward & Birner (1995) discuss the relevance of discourse new definites in existential contexts, cf. also McNally (this volume). The definites in (16) and (17) have determined reference because their discourse referent is unique relative to the model, so these non-familiar definites exemplify the feature combination [+Max][−Fam]. For discourse referents with this feature combination, the definite comes out as the optimal form in the grammar, as illustrated in Tableaux 8.4 and 8.5, for English and Hungarian.

As Tableaux 8.4 and 8.5 illustrate, English and Hungarian differ in their relative ranking of the constraints *Def/[−Fam] and MaxMax, but are alike in ranking FDef above both. The feature [+Max] in the input requires

Tableau 8.4 Non-familiar non-generic definites in 'high familiarity' languages (illustrated with English 16b)

Meaning first person to sail to America(x) [+Max] [−Fam]	Form	FDef	*Def/−fam	MaxMax	*Art
	a first person to sail to America	*		*	*
☞	the first person to sail to America		*		*

Tableau 8.5 Non-familiar maximal non-generic definites in 'high maximality' languages (illustrated with Hungarian 17b)

Meaning best student(x) [+Max] [−Fam]	Form	FDef	MaxMax	*Def/−fam	*Art
	egy legjobb diákom	*	*		*
☞	a legjobb diákom			*	*

determined reference to be parsed in order to satisfy the high-ranked constraint FDef. In non-generic contexts, a definite form is the winner in both languages, because, unlike in generic environments, there is no alternative way of parsing determined reference.[5] In sum, the role of FDef in the grammar is crucial in accounting for stability of article choice in non-generic contexts across the languages under consideration, and the cross-linguistic variation found in plural generics.

As the unmarked member of the opposition, indefinite NPs do not impose determined reference, and just introduce a discourse referent. Even though the indefinite has such a weak, unmarked meaning, it can express a contrast with a definite NP. Suppose the speaker wants to introduce just a discourse referent, and wishes to remain uncommitted with respect to whether the referent has determined reference. In this case, the constraint FDef is vacuously satisfied in the OT syntax, but *Def/−fam blocks the use of the definite form. This is illustrated in Tableau 8.6.

There is no distinction between high familiarity and high maximality languages, for the difference in ranking between *Def/−fam and MaxMax is irrelevant in this case. Tableau 8.6 shows that the definite form is marked, and cannot be used to express an unmarked meaning.

As a result of their unmarked status, indefinite NPs are not incompatible with familiarity or maximality of the discourse referent *per se*. As far as the interpretation of an indefinite form is concerned, the discourse referent introduced by the indefinite is taken to be non-familiar and non-maximal by conversational implicature. For Horn (2005), Farkas (2006), and de Swart

[5] For the sake of completeness, we should mention the case of [+Fam] [−Max] discourse referents. Imagine a situation in which we have set up three discourse referents a, b, and c, and we know that a, b, c are children. If we now want to refer to a, neither the indefinite *a child*, nor the definite *the child* would be appropriate, rather the partitive *one of the children* would be used. This suggests that a full grammar of English involves more candidates than just the definite and indefinite articles, and more constraints than what we have here. An account of the three-way contrast between definites, indefinites, and partitives is beyond the scope of this chapter.

Tableau 8.6 Non-familiar, non maximal non-generic indefinites (illustrated for English with the first sentence of 14a)

Meaning child(x) [−Max] [−Fam]	Form	FDef	*Def/−fam	MaxMax	*Art
☞	a child				*
	the child		*		*

(2006) the definite and indefinite articles form the scale in <the, a>. Within the approach to scalar implicatures developed by Horn (1984) and Levinson (2001), lack of maximality and familiarity specifications characterizing indefinites is strengthened to non-maximality and non-familiarity as the result of an I-implicature (Horn (1984), Levinson (2001)). There are, however, contexts where these implicatures do not arise and where indefinites are compatible with unique or maximal interpretations. Farkas (2006) discusses examples with 'singleton indefinites' like (18a), taken from Schwarzschild (2002), to support her claim that non-uniqueness can be cancelled. Similarly, Bosveld-de Smet (1998) provides examples of French indefinite plurals that do not necessarily block maximality (18b).[6]

(18) a. We will watch a movie that Phil said he liked the best.

b. Des étudiants ont manifesté.
Indef_pl students have demonstrated.

Example (18a) invites an interpretation where there is only one movie Phil said he liked the best. In (18b), we focus on the collective participation in a single event, and we do not get any indication as to the question of whether all the students were involved, or only a subset of them was. The fact that 'the' and 'les' are not used in (18a) and (18b) respectively indicates lack of determined reference marking and therefore speaker indifference to it. Since the indefinite is the unmarked member of the definite/indefinite pair *<the, a>* the OT syntax governing article choice does not involve a constraint selecting for indefiniteness but only constraints governing the use of definite forms.

8.4 Article choice in singular generics

In this section we return to generic environments, concentrating this time on singular generics. Recall from section 8.2 that cross-linguistic variation

[6] It is not unlikely that the definiteness effects with bare nominals Heycock & Zamparelli (2003) discuss in coordination contexts is an instance of the same phenomenon.

is found with plural generics: the English/Dutch group contrasts with Romance/Hungarian/Greek in that the former uses indefinite forms in generic plurals while the latter languages use a definite form. In this section we address the question of why this contrast is neutralized in singular generics, where both groups of languages use a definite form when direct reference to a well-established kind is involved (section 8.4.1), and an indefinite or a definite form in generic generalizations (section 8.4.2).

8.4.1 *Direct reference to kinds*

Following Carlson's seminal work (Carlson (1977b)), we have assumed in section 8.2.3 above that the ontology comprises, besides ordinary individuals, special kind-level individuals as well. Singular generics denote atomic kinds, special in that their realizations are individuals, whereas the realizations of ordinary individuals are stages, that is, spatio-temporal 'slices' of individuals. Atomic kinds are special also in that many kinds are structured into sub-kinds that form taxonomical structures as schematized in Figure 8.1.

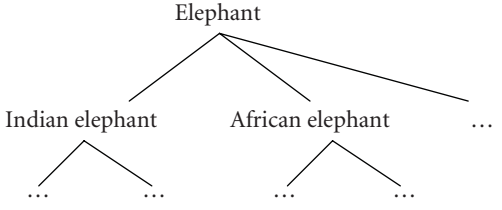


FIGURE 8.1. The elephant and its sub-kinds

Every node in this tree is an atomic kind, with the highest one being the most inclusive.

Since we have kind-level atoms in the ontology, we expect NPs to be able to refer to them. And indeed, we have such direct kind-level reference to well-established kinds in (19):

(19) a. *The elephant* is widespread. E
b. *De olifant* is wijdverbreid. D
c. *L'éléphant* est commun. F
d. *Elefantul* e răspîndit. R
e. *Az elefant* gyakori. H

The representation of the meaning of the sentences in (19) is given in (20):[7]

(20) $\exists!k(\text{elephant}(k) \wedge \text{widespread}(k)$

According to the semantics in (20), the definite (italicized) NPs in (19) denote one particular atomic kind-level entity, namely the highest node in the tree in Figure 8.1.[8] We see in (19) that the languages in both our groups uniformly use singular definite NPs to refer to such atomic kinds. This is as expected, for the discourse referent introduced by the NP is a well-established kind, which qualifies as a unique, familiar entity. The relevant discourse referent is [+Max] and [+Fam]. The mechanism imposing the choice of a definite form over an indefinite one in (19) is thus the same as the one used in non-generic contexts (cf. section 8.3 above). Given the high ranking of FDef in all the languages under consideration here, the system we set up so far predicts uniform definite singular forms.

Article use with generics referring to atomic kinds thus parallels article selection in non-generic contexts, and contrasts with what we find in generic plurals referring to plural kinds. Such plural generics involve the sum operator Σ, and we have assumed that all sentences involving this operator satisfy FDef. With singulars, no special generic operator comes into play in the expression of direct kind reference. As a result, the only way to parse determined reference and satisfy FDef is by the use of the definite article.

Given the possibility of taxonomic structures such as the one above, we predict the possibility of indefinite singular sub-kind (or taxonomic) reference. This happens when the value of the kind-level discourse referent is not narrowed down (yet) to a particular node in the relevant taxonomic tree. In such cases, the NP does not have determined reference since its denotation is one of the nodes of the taxonomical structure identified by its descriptive content, and therefore its referent is not fixed. In the absence of determined reference, FDef is automatically satisfied. Our account predicts the use of an indefinite singular form in such cases in all the languages under consideration, by the same mechanism that leads to an indefinite singular form in case

[7] We adhere strictly to Carlson's original view here, and do not follow the neo-Carlsonian treatment of singular generics developed by Chierchia (1998a) and Dayal (2004). Their proposals are driven by the parametrized reference to individuals in Chierchia (1998a). Given that we use the typology of Hendriks et al. (2007: chapter 7), we can maintain Carlson's original insights without losing the contrast between reference to atomic kinds by definite singulars (in English, Romance, etc.) and bare singulars (in Hindi, Chinese, etc.). Note that not all languages allow kind-level predicates in combination with singulars. For instance, our Greek informant resisted the use of the definite singular in contexts like (19). We don't have anything to say about the requirement for a plural form in such cases.

[8] One can, of course, refer to a subspecies of elephant by a singular definite, such as *the Indian elephant*. In that case too the NP refers to the unique atomic kind identified by its descriptive content.

of ordinary indefinite individual reference. This is indeed what we find, as exemplified in (21), whose representation is given in (22):

(21) a. *A (kind of) elephant* is widespread. E
b. *Een (soort van) olifant* is wijdverbreid. D
c. *Un(e) (espèce d')éléphant* est commun(e). F
d. *Un (soi de) elefant* e răspîndit. R
e. *Egy (fajta) elefant* gyakori. H

(22) $\exists k(\text{elephant}(k) \wedge \text{widespread}(k)$

The analysis we have developed predicts, correctly, that a kind-denoting indefinite NP as in (21) can only get a taxonomical reading. This is so because the use of an indefinite form implicates that the definite could not have been chosen, and therefore that the conditions for definiteness are not met. This means that the relevant discourse referent must be assumed not to have determined reference and therefore not to be unique. Direct kind reference involves uniqueness, so a taxonomic reading is the only way non-unique kind reference can be achieved.

To sum up, the use of definite/indefinite forms in sentences involving direct singular kind reference is regulated, in our view, by exactly the same mechanism that decides between these forms in ordinary non-generic contexts. We therefore correctly predict that our two groups of languages will not contrast in the choices they make. A definite singular form will be interpreted as involving unique atomic-kind reference, denoting the node in the taxonomic kind identified by the descriptive content of the NP. An indefinite singular form will be interpreted taxonomically. In that case the kind-level discourse referent does not have determined reference: any sub-node in the taxonomic tree identified by the descriptive content is a possible value for the relevant discourse referent. Thus, *the Indian elephant*, we predict, when used generically, can only refer to the species **Indian elephant**. Kind reference with *an Indian elephant* on the other hand can only involve reference to some sub-kind of Indian elephant, i.e. to one of the nodes in the taxonomic sub-tree dominated by the kind **Indian elephant**.

8.4.2 *Generic generalizations with singulars*

8.4.2.1 *Basic observations* As far as kind reference is concerned, the ontological assumption that kinds exist alongside regular individuals was sufficient to account for article choice in all the languages under consideration. When we turn to generic generalizations involving singular generics, matters become

more complex. We distinguish two cases: generalizations involving stage-level predicates, exemplified in (23a), and generalizations over individual-level predicates, exemplified in (23b,c).

(23) a. *A dog* is dangerous when it is hungry.
(indefinite generalization over stages)

b. *A cocker spaniel* is very intelligent.
(taxonomic or indefinite generalization over individuals)

c. *The cocker spaniel* is intelligent.
(definite generalization over individuals)

Again, we see that the cross-linguistic contrast we found in the plural case disappears in the singular. Languages in both groups use indefinite forms in generalizations over stages and definite or indefinite forms in generalizations over individuals.[9]

(24) a. *Een hond* is gevaarlijk wanneer hij honger heeft. D
a dog is dangerous when he hunger has

b. *Een cocker-spaniel* is erg intelligent.
a cocker spaniel is very intelligent

c. *De cocker-spaniel* is erg intelligent.
the cocker spaniel is very intelligent

(25) a. *Un chien* est dangereux quand il a faim. F
a dog is dangerous when he has hunger

b. *Un cocker* est très intelligent.
a cocker is very intelligent

c. *Le cocker* est très intelligent.
the cocker is very intelligent

(26) a. *Egy kutya veszélyes* mikor éhes. H
a dog dangerous when hungry

b. *Egy spániel* nagyon okos.
a spaniel very intelligent

[9] Some languages prefer the definite form over the indefinite one in the (b)–(c) examples (e.g. Greek), but we have not been able to find clear patterns or a convincing explanation. Behrens (2005) also discusses this issue, but remains at a descriptive level. Not all predicates combine with a singular indefinite generic. Compare Schwarzschild (2002), Cohen (2001), and literature cited in those works for further discussion. These issues are outside the scope of this chapter, but, we believe, not incompatible with the line of argumentation advanced here.

c. *A* *spániel* nagyon okos.
the spaniel very intelligent

We address the issues in two subsections, starting with individual-level predicates in 8.4.2.2.

8.4.2.2 *Individual-level predicates* We have already seen that both definite and indefinite singulars are acceptable in generic generalizations involving individual-level predicates, cf. (23b,c)–(26b,c). We take the two forms to be related to two different semantic representations. The definite singular in (23c)–(26c) predicates intelligence directly of the kind *cocker spaniel*. In this case, *the cocker spaniel* refers directly to the unique kind level individual constituted by this canine species. An interpretation in terms of atomic-kind reference is the only way a definite singular in the languages under consideration can acquire generic reference. The predicate here, however, is individual-level rather than kind-level and therefore we are dealing with a mismatch between the type of the variable (kind-level) and the type the predicate requires as its argument (individual-level). Such mismatches can be fixed by allowing either for the possibility of lowering the nominal (via a realization relation) or for the possibility of raising the predicate. We adopt the first option here although nothing in what follows rests on this choice:

(27) a. *The cocker spaniel* is intelligent.

b. $\exists!k(\text{cocker spaniel}(k) \wedge \text{Gen}_s\ [\exists x(R(x,k),s)]\ [\text{intelligent}(x,s)]$

The definite nominal introduces a kind-level variable whose individual realizations are brought into play by a Carlsonian realization relation R, and indirectly bound by the generic operator. Using the R relation here amounts to having a type-shift that takes kinds to their individual realizations. We differ from Chierchia and Dayal in that its use is not free. The type-shift is triggered, strictly, by the type mismatch between the predicate and its argument. The semantic representation in (27b) triggers the use of the definite article in the (c) examples of (23)–(26). According to the OT constraint system, the selection of a definite article is in order because we have here reference to a unique and familiar entity, namely the atomic, well-established kind *cocker spaniel*. The combination of the features [+Max] [+Fam] requires marking by a definite article in languages with a high ranking of FDef. Given that FDef is ranked high in all the languages under consideration, we predict no cross-linguistic variation in this case, and indeed we find none.

Indefinite singulars are the outcome of two possible expressive optimization processes. Under one reading, the (b) sentences of (23)–(26) have a taxonomic

interpretation, where the indefinite refers to a sub-kind of dog. This interpretation is spelled out in (28):

(28) a. *A cocker-spaniel* is intelligent. (taxonomic reading)

b. $\exists k(\text{cocker-spaniel}(k) \wedge \text{Gen}_s\ [\exists x(R(x,k),s)]\ [\text{intelligent}(x,s)]$

The indefinite nominal here introduces a kind-level variable, just as in (27). The main difference is that the discourse referent is not unique and familiar, because now it refers to one of the sub-branches in the sub-kind structure of cocker spaniels, but we do not know which one. The feature combination [−Fam][−Max] triggers the use of an indefinite article, just as in the case of (21) in section 8.4.1 above.

The other possible interpretation of the (b) sentences of (23)–(26) involves the generic operator Gen. These sentences express a generalization over individual dogs, and don't involve reference to kinds. We refer to such interpretations as strict generic generalizations in contrast to the definite generic in (27):

(29) a. *A cocker spaniel* is intelligent. (strict generic generalization)

b. $\text{Gen}_s[\exists x(\text{cocker spaniel}(x,s))][\text{intelligent}(x,s)]$

The indefinite singular in (29a) introduces a discourse referent *x* that is novel because it is indirectly bound by the generic operator Gen. Gen ranges over a set of dog-size situations (situations with a dog in them). Due to a general constraint against vacuous quantification (de Swart (1991), de Swart (1996), section 8.2.3 above), this set of situations cannot be a singleton set. If individuating the relevant situations amounts to individuating dogs, then the non-singleton requirement on the set of situations amounts to a non-singleton requirement on the set of dogs involved. Given that the singular definite imposes determined reference upon a discourse referent with an atomic value, a definite singular cannot be used in a strict generic generalization. Therefore, a semantic representation of the (c) sentences of (23)–(26) in terms of a Gen operator indirectly binding the discourse referent introduced by the definite singular is not available. However, generic generalizations over individual-level predicates can be conveyed with a definite singular generic, because there is an interpretation in terms of kind reference that can be assigned to the (c) sentences of (23)–(26), along the lines of (27).

8.4.2.3 *Stage-level predicates* We now come to the problem of article selection in generic generalizations that involve stage-level predicates. The singular generic in the (a) sentences of (23)–(26), just like its plural counterpart, introduces a discourse referent indirectly bound by Gen. Gen here quantifies over

typical dog-sized situations that have a hungry dog in them. In such situations, the sentence claims, the dog-stage is generally dangerous. The representation is given in (30), where x^s stands for a stage-level instantiation of the dog variable x.

(30) a. *A dog* is dangerous when it is hungry. (strict generic generalization)

b. Gen_s [($\exists$x dog(x,s)] [Hab ($\exists$e hungry(x^s,e)) (dangerous(x^s,e))]

Note that this example involves not only the generic operator Gen but an additional habitual operator Hab. Hab ranges over stage-level predicates and creates an individual-level property, along the lines of Carlson (1977b). Languages in both groups choose *indefinite* singular forms here, even though they contrast when it comes to the choice of the article in the corresponding plural generic case. The explanation follows along the same lines as that of the (b) examples of (23)–(26) above. The indefinite article is called for in strict generic generalizations because the definite singular creates a singleton set, which is incompatible with the plurality requirement on the Gen operator. Cross-linguistic stability is predicted here because the languages under consideration all have the same semantics of the definite article.

A question that remains to be answered is why languages in both groups choose *indefinite* singular forms here, i.e. why don't we have (31) as the counterpart to (23a), just as we have (23c) as the counterpart to (23b):

(31) *The dog* is dangerous when it is hungry. (*Gen/$\surd$specific dog)

(31) is a well-formed sentence, but it refers to a specific dog that has the habit of getting dangerous when it is hungry. It cannot be used to predicate this habit of the atomic kind *dog*. We conjecture that this has to do with the fact that the predicate involved is stage-level. Remember that the semantic representation of (23c/27a) in (27b) involves the lowering of an atomic-kind variable to its individual realizations. Somehow, this process of lowering is blocked by the presence of a stage-level predicate. Note also that (30a) only has the semantic representation in (30b). The sentence does not have a taxonomic reading similar to (28a), along the lines of (28b). We conclude that reference to atomic kinds is generally unavailable with a stage-level predicate.[10]

[10] It is possible that this process is not blocked for all languages. A Bulgarian example doing just what (31) cannot do is given in (i):

(i) Kuche**to** e opasno kogato e gladno.
dog.the is dangerous when it is hungry

More systematic cross-linguistic research will have to determine the variation ranging from Greek (cf. footnote 5 above) via English/Romance/Hungarian to Bulgarian.

According to what we have said so far, we express generic generalizations over individual level predicates with definite as well as indefinite forms (23b, c). There is a difference between strict and non-strict generic generalizations, as we can see in (27) and (29), but the semantic representations are truth-conditionally equivalent. What frequently goes unnoticed is that the discourse effects of definite and indefinite singular generics are distinct. The strict generic generalization in (29b) does not involve direct reference to a kind, while the more complex interpretation in (27b) does involve such reference. So whether the speaker chooses the definite or the indefinite form depends on whether she intends to convey direct reference to a well-established kind as part of the message or not. If yes, a definite singular will be used, because the referent has the features [+Max] [+Fam]. Otherwise the form of the singular NP will be indefinite. Some relevant examples that illustrate the distinction between well-established (i.e. familiar) kinds are in (32) (inspired by Krifka et al. (1995)):

(32) a. A green bottle is attractive to customers.
b. The green bottle is attractive to customers. (*Gen/√specific bottle)
c. The Coca-Cola bottle is attractive to customers.

Given that the use of a definite article is driven by determined reference, we expect to find definite generics with kinds that are well established on the basis of world knowledge (as in 32c). However, another way to establish determined reference is via a discourse anaphoric relation, as we see in examples (3) and (4) in section 8.1. Example (33) shows that discourse anaphoric reference can trigger the use of a definite generic singular:

(33) '**We need a new bottle** – a distinctive package that will help us fight substitutions . . . we need a bottle which a person will recognize as *a Coca-Cola bottle* even when he feels it in the dark. *The Coca-Cola bottle* should be so shaped that, even if broken, a person could tell what it was . . .', wrote the company's legal counsel in 1915, urging management to develop packaging that could be protected by trademark and patent laws. [http://www.cdf.org/cdf/atissue/vol2_2/cocacola/cocacola.html]

A new sub-kind of *bottle* is introduced in the first sentence of (35), and defined as *a Coca-Cola bottle*. This new sub-kind is then picked up with the definite generic *the Coca-Cola bottle* in the subsequent discourse. The definite singular has determined reference, because discourse familiarity as a single value for the atomic discourse referent is available in the context. The role of discourse anaphoricity in (32) is reminiscent of the discourse contrast between definite

and bare plural generics we find in languages like English. Farkas & de Swart (2007) discuss examples such as Dutch (34):

(34) Dus de dieren die wij *dinosaurussen* noemen zijn echt uitgestorven. (...)
Het is niet precies bekend hoe *de dinosaurussen* zijn uitgestorven.
So the animals we call dinosaurs are really extinct. (...)
It is not exactly known how the dinosaurs died out.
[http://www.dinosaurus.net/AlgemeneInfo/Uitsterven/uitsterven.htm]

The similarities between (33) and (34) make it clear that article choice is sensitive to discourse anaphoricity, not only in non-generic contexts, as is well known, but also in generic contexts. Singular and plural generics behave alike in their preference for a definite article in contexts where kind reference has been established in the preceding discourse.

8.5 Conclusion

In this chapter we provided an account of cross-linguistic stability and variation in article choice across two groups of languages, English/Dutch, on the one hand, and Romance/Hungarian/Greek on the other. We started from reviewing our earlier account of the contrast between these two groups with respect to the form chosen in plural generics. That analysis relies crucially on the system of constraints independently proposed in Hendriks et al. (2009: chapter 7), supplemented by two constraints that take into account the two components of determined reference, maximality and familiarity. Plural generic NPs introduce maximal and non-familiar variables. The contrast between the two language groups reduces to the fact that in English/Dutch the non-familiar feature blocks the use of a definite form while in Romance/Hungarian/Greek it does not.

The rest of the chapter is devoted to an account of cross-linguistic stability in article choice across the languages under consideration when it comes to non-generic contexts as well as generic singulars. The heart of the matter in non-generic contexts concerns the fact that in such environments the article is the only vehicle that can encode determined reference while in generic sentences the nature of the interpretation of the variable is encoded in the generic operator. In the case of singular generics, the use of the indefinite form in all the languages under consideration is connected to the clash between uniqueness (associated with definite singular forms) and the property of being bound by a generic operator. In the account that emerges, article choice is a

matter that crucially binds together the number of the NP and the semantic environment in which it occurs.

There are many questions that arise at this point. The most pressing one is extending the typology to a larger group of languages, and a larger group of nominal types (including, for example, partitive constructions). The tools and analyses in the present chapter, we hope, will provide a useful stepping-stone in understanding these larger issues.

9

The temporal degree adjectives *früh(er)/spät(er)* 'early(er)'/'late(r)' and the semantics of the positive

ARNIM VON STECHOW

9.1 Introduction[1]

There is a rich literature about the temporal conjunctions *before/after*, but at the time I gave the talk that underlies this chapter I was not aware of any analysis of the temporal comparatives *früher/später* '*earlier/later*', which may be used to express similar states of affairs, but are constructed differently.[2] Recently I became acquainted with Del Prete's thesis about Italian *prima/dopo*, which analyses *prima* as a comparative and *dopo* as a preposition.[3] This is the only paper known to me that goes into the same direction as the following proposal. Del Prete's analysis is very different from mine and I must leave the discussion of his theory to another occasion.

The semantics of *before/after* is notoriously controversial and the semantics of the related adjectives is therefore interesting in itself. A study of the adjectives gains additional interest from the fact that they are constructed entirely differently from the temporal prepositions: they are degree adjectives and have a comparative, an equative, and a positive variant. I will study the comparative and the positive variant.

[1] Previous versions of this article were presented in Stuttgart on 3 December 2005, Saarbrücken on 16 December 2005, and in Frankfurt on 1 June 2006. I want to thank the audiences for helpful comments. The original article contained sections about the interaction between *früh/spät* 'early/late' and *schon/noch/erst* 'already/still/only'. I am no longer sure that this part was entirely correct. It is therefore left to another occasion. The German examples in the article are motivated by the earlier version. I could have made all the points with English alone. Since the German sentences are all translated and easy enough to remember, I left them. I wish to thank Bhuvana Narasimhan for checking my English.

[2] See Beaver & Condoravdi (2003) and the references given there.

[3] Del Prete (2005).

Particular attention will be devoted to the positive forms of the adjectives because I have a novel proposal for a positive operator that solves a long-standing puzzle in the semantics of degree adjectives, namely the question of how we can give a uniform treatment of the positive form of both poles of antonym pairs such as *tall/short*.

As I have said, the comparative variants 'earlier'/'later' are particularly intriguing because they are temporal comparatives, and time is a dimension that has not been studied in the semantics of degree. The analysis of the two adjectives deepens our insight into the nature of degree constructions, one of the central areas of our thinking. Times play a double and perhaps confusing role in the semantics of 'early/late'. It was quite surprising to me that the roots of the two adjectives simply express the temporal relations $<$ (before) and $\geq$ (after or simultaneously), respectively. So the basic meanings are very much related to the meaning of the prepositions *before/after*, but the syntax and semantics of degree adjectives will make their behaviour entirely different.

Here are some data that illustrate that *früher/später* exhibit the relevant properties of comparative adjectives. The first two examples show that the adjectives have comparative complements.

(1) Alla kam früher/später zur Arbeit als Olga (kam).
Alla came earlier/later to work than Olga (came).

(2) Alla kam früher/später als wir dachten.
Alla came earlier/later than we thought.

As expected, NPIs are licensed in the complement of both *früher* and *später* (as opposed to the complement of *after*).

(3) Alla kam früher/später zur Arbeit als **jemals** zuvor.
Alla came earlier/later to work than **ever** before.

(4) Alla kam früher/später als **auch nur** irgendjemand von uns gedacht hätte.
Alla went earlier/later than **anyone** of us would have thought.

(5) Alla gab ihre Arbeit früher/?später ab, als sie sie abzugeben **brauchte**.
Alla delivered her thesis earlier/?later than she **needed** to deliver it.

In the approach I am pursuing here, the meaning of comparative adjectives is not derived from that of positive adjectives (nor vice versa). Rather I hold the view that the positive is a particular universal quantifier, which quantifies over degrees. My semantics of the positive will entail the following synonymy, which might be regarded as a diagnostic for the correctness of the meaning of the operator:

(6) a. Es ist nicht spät ↔ Es ist früh oder es ist weder früh noch spät
it is not late ↔ it is early or it is neither early nor late

b. Es ist nicht früh ↔ Es ist spät oder es ist weder früh noch spät
it is not early ↔ it is late or it is neither early nor late

For other degree adjectives similar equivalences should follow:

(7) a. Ede ist nicht groß ↔ Ede ist klein oder weder klein noch groß
Ede is not tall ↔ Ede is short or neither short nor tall

b. Ede ist nicht klein ↔ Ede ist groß oder weder klein noch groß
Ede is not short ↔ Ede is tall or neither short nor tall

My proposal for the semantics of the positive may be regarded as a general contribution to the semantics and syntax of degree constructions.

The structure of the chapter is as follows. I start with the syntax/semantics of degree adjectives; I am assuming Heim's negation theory of antonymy,[4] and introduce overt degree phrases. To explain cross-polar anomalies, the degree phrases have to be lifted to the quantifier level. I then introduce a positive operator *Pos* that gives a unified semantics for polar opposites. *Pos* makes essential use of a contextually given function *N* that assigns each adjective *A* a neutral domain of $N(S_A)$, where S_A is the scale determined by A. *Pos* is a universal quantifier that is restricted by $N(S_A)$. The next step is to introduce tense into degree constructions. We are then prepared to formulate the meanings of the temporal adjectives *früh* 'early' and *spät* 'late'. We will show that the two denote the temporal relations $<$ and $\geq$, respectively. The next step will be to introduce the comparative. The usual analyses are transferred in a straightforward way to the temporal adjectives. The only non-trivial step is to account for the adverbial use of 'early'/'late'. I will have to introduce the perfective operator. Finally, I briefly indicate where differentials ('5 minutes later') enter the picture.

9.2 'Normal' degree adjectives

In this section, I will recapitulate Heim's version of the semantics of degree adjectives.[5] The basic idea is taken from Cresswell (1976). An adjective like *tall* determines a *scale* Σ_{tall} of degrees that are measured in meters in a vertical direction. The degrees themselves are abstract objects, say numbers assigned to equivalence classes of possible things that have the same height. So Σ_{tall} is

[4] Heim (2004). [5] Heim (2004).

more accurately a structure $\Sigma_{tall} = \langle S_{tall}, m, < \rangle$, where S_{tall} is a set of degrees that are linearly ordered by $<$ and whose distance is measured by the unit meter (m). I will assume that S_{tall} has a smallest element called 0 and has no upper bound, i.e. it contains arbitrarily high degrees. A further assumption is that the carrier set of a scale is dense, that is, if d and d′ are in a S_{tall} and $d > d'$, then there is a d″ in S_{tall} such that $d > d''$ and $d'' > d'$. The union of all carrier sets S_A is the set of degrees D_d.

The meaning of an adjective *A* is based on a measure function f_A that assigns each individual a degree on its scale S_A. Let us assume the type d for degrees together with the usual types *e* (individuals), *i* (times), *v* (events), *s* (worlds), *t* (truth-values). A measure function is therefore of semantic type ed. Typical measure functions are these:

(8) Measure functions
HEIGHT = $\lambda x \in D_e$.x's height
INTELLIGENCE = $\lambda x \in D_e$.x's intelligence
WEIGHT = $\lambda x \in D_e$.x's weight

Measure functions assign unique degrees to individuals. HEIGHT(x) is the maximal degree to which x is tall and so on for different measure functions. Since the height of a person varies with time and world, the functions also depend on time and world. We will add these parameters when we need them.

For Cresswell (1976), an adjective *A* relates an individual *x* to the unique degree *d* it occupies on the scale D_A, that is, there is precisely one *d* such that *A* holds of the pair (x,d). Heim builds a monotonicity condition into the meaning of *A*: when an adjective *A* is true of the pair (x,d), then it is true also of every (x,d′) where $d' < d$. If we take into account everything we have said so far, the meaning of degree adjectives can be described in the following way.

(9) Degree adjectives
$[\![\textbf{tall}]\!] = \lambda d: d \in S_{tall}.\lambda x \in D_e.$ HEIGHT(x) $\geq$ d

Following Heim (2004), antonym pairs such as *tall/small* are related via internal negation.[6]

(10) Adjective Negation (internal negation)
$[\![\neg_{(det)(det)}]\!] = \lambda R_{det} \lambda d.\lambda x.\neg R(d)(x)$

[6] A related, but only axiomatic, proposal has been made in Stechow (1984a).

This is a sloppy definition. We will have to make sure that the negation remains within the scale of adjective under consideration. We may define the negative pole by means of the positive pole plus negation, or we may do it the other way round. The antonyms of the adjectives considered may be defined in the following way:

(11) a. **short** := ¬**tall**

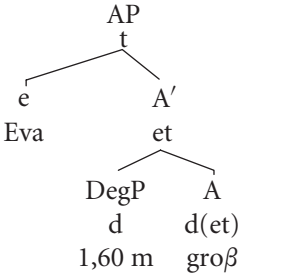
b. **stupid** := ¬**intelligent**

Degrees of adjectives can sometimes be made explicit by overt degree phrases as in the following example.

(12) Eva ist 1,60 m groß.
Eva is 1.60 m tall.

The most straightforward LF is the following:

(13) LF without tense



HEIGHT(Eva) ≥ 1,60 m

Note that this LF contains no positive operator although the morphology of the adjective is positive. The semantics predicts the following two implications, which seems correct.

(14) a. Eva is not 1,60 m tall ==> Eva is smaller than 1,60 m.

b. Eva is 1,60 m tall ==> Eva is 1,56 m tall.

This account cannot, however, explain the oddness of the following sentence.

(15) #Eva is 1,56 m short.

In fact, the analysis would yield the following meaning for the sentence, obviously a wrong prediction:

(16) HEIGHT(Eva) < 1,56 m
'Eva is shorter than 1,56 m'.

Stechow (1984a) says that degree phrases play a double role: they name the top of an interval and measure its length. Negative poles don't have a length because they are unbounded at one side. Therefore, measure phrases only combine with positive poles.

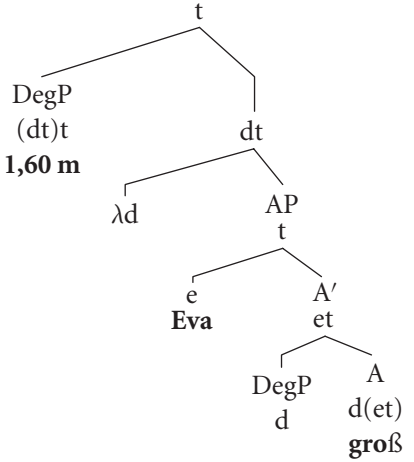
(17) [.....Eva 1,56 m tall.....](.....#Eva 1,56 m short.....>
| +1,56----------> ∞

This explanation has been accepted by a number of researchers, e.g. Kennedy (2001) and Meier (2003a), and I will assume that it is correct. In order to implement the idea, we have to type-lift degree phrases to the quantifier level:

(18) Measure phrases are of type (dt)t.
⟦ **1,56 m** ⟧ = λI_{dt}: I has a finite length. LENGTH(I) ≥ 1,56 m.

The LF of (12) is now:

(19) Eva is 1,60 m tall.



LENGTH(λd.HEIGHT(Eva) ≥ d) ≥ 1,60 m

The set λd.HEIGHT(Eva) ≥ d may be regarded as the interval which corresponds precisely to Eva's height.[7] Clearly this interval has a finite length, though it contains infinitely many degrees (as any dense interval does).

The revised semantics makes (15) undefined because the interval **λd.Eva (is) d-short** has no finite length. For different proposals, see Klein (1994), Bierwisch (1987), Schwarzschild (2004), among others.

The reader may verify for himself that the inferences in (14) are preserved under the revision. Furthermore, negated sentences are correctly analysed:

[7] Kennedy (2001) calls these sets degrees and takes them as basic units for the semantics.

(20) a. Eva ist keine 1,60 m groß.
Eva is not 1,60 m tall.

b. **not** [**1,60 m** [λ**d. Eva d tall**]]
= LENGTH(λd.HEIGHT(Eva) ≥ d) < 1,60 m

LENGTH(D) is defined as MAX(D) – MIN(D). If D has no maximal or minimal element, the difference is not defined.

Note that sentences with overt degree phrase are morphologically positive, but they do not contain the positive operator, which is introduced in the following section. The positive operator will make the denotation of APs context-dependent. The denotation of APs with overt degree phrases is not context-dependent but absolute.

9.3 A new positive operator

The positive operator I propose is based on the assumption that a degree scale *S* like that for *tall* is divided into three parts, a part that contains the short things under consideration, a part that contains the tall things under consideration, and a neutral part $N(S)$ that contains the things that are neither short nor tall.

(21) S |--------[--------------------]--> ∞
short Neutral **tall**

This picture has been popular in the semantics of polar adjectives for decades, but it has never been exploited for the semantics of the positive operator, which is defined in the following way:

(22) The positive operator
$[\![\mathbf{Pos}_N]\!]^g = \lambda A_{dt}.(\forall d \in g(N)(S_A))\ A(d)$

N is a contextually determined function that gives the neutral segment of the scale in a particular context. I assume that the scale is provided by the adjective modified. In other words, the **Pos**-operator is a universal quantifier over degrees, which is restricted by the contextually neutral degrees of the relevant scale. Note that the scale S_A is uniquely determined by the adjective A, but the neutral segment $g(N)(S_A)$ varies with the contextual assignment function g.[8] Recall Cresswell's observation (Cresswell (1976)), which makes the point:

(23) Fifi is a big flea but a small animal.

[8] It is tedious to write g in the semantics. Therefore, I will omit it henceforth, but it should be there.

The two positive operators that figure in the LF of this sentence are relativized to two different neutral functions. The first gives us the sizes of fleas that are neither small nor big, the second gives us the sizes of animals that are neither small nor big.

Here is the LF for a simple positive sentence.

(24) Ede is tall.
$[\![\mathbf{Pos_N}\lambda\mathbf{d.tall(d)(Ede)}]\!]$ iff $(\forall d \in N(S_{tall}))$ HEIGHT(Ede) $\geq$ d
| --------[-------------------]----x-----------------> ∞

In the picture, x stands for the height of Ede. There is a glitch here. In the limiting case, the height of Ede might coincide with the right border of the neutral interval. Then (24) should be true in a scenario where Ede belongs to the things that are neither tall nor short. In order to avoid this unwelcome consequence, we have to add the stipulation that the right border of the neutral interval counts as positive tallness. I will assume this henceforth.

Consider the interaction of **Pos** with negation. Recall that we want to deduce the equivalences in (7). Syntactic negation has the standard meaning, namely reversal of truth-value.

(25) Ede is not tall.
$[\![\mathbf{not\ Pos_N}\lambda\mathbf{d.tall(d)(Ede)}]\!]$ iff $\neg(\forall d \in N(S_{tall}))$ HEIGHT(Ede) $\geq$ d
| --------[---------x----------]----------> ∞
or
| -----x--[--------------------]----------> ∞

Syntactic negation always has wide scope with respect to **Pos**. A negation that has narrow scope with respect to **Pos** is morphologically realized as the negative pole of the antonym pair. I leave it to the reader to draw diagrams for the examples involving the adjective *short*.

(26) Ede is short.
$[\![\mathbf{Pos_N}\lambda\mathbf{d.short(d)(Ede)}]\!]$ iff $(\forall d \in N(S_{tall}))$ HEIGHT(Ede) $<$ d

(27) Ede is not short.
$[\![\mathbf{not\ Pos_N}\lambda\mathbf{d.short(d)(Ede)}]\!]$ iff $\neg(\forall d \in N(S_{tall}))$ HEIGHT(Ede) $<$ d

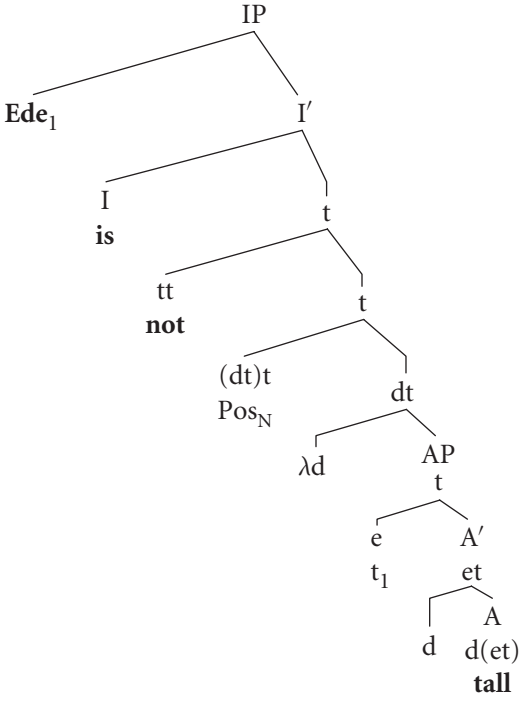
And, of course, we can express the idea that Ede's height is in the neutral area of the scale.

(28) Ede is neither short nor tall.
$[\![\mathbf{not\ Pos_N}\lambda\mathbf{d.short(d)(Ede)\ \&\ not\ Pos_N}\lambda\mathbf{d.tall(d)(Ede)}]\!]$
iff $\neg(\forall d \in N(S_{tall}))$ HEIGHT(Ede) $<$ d & $\neg(\forall d \in N(S_{tall}))$ HEIGHT(Ede) $\geq$ d

It is obvious from these examples that the equivalences in (7) are valid.

A remark on the relation between LF and s-structure might be helpful at this point. Here is the s-structure for (25):

(29) Ede is not tall. (SS)



Since we have ignored tense, the copula may be assumed to be semantically empty. It is therefore deleted at LF by Chomsky's Principle of *Full Interpretation* (FI), which says that an interface (LF or PF) contains only material interpretable at the interface. The subject is reconstructed to its base position. That gives us the formula in (25).[9]

The positive operator gives a unified semantics for the positive and the negative pole of an antonym pair. Let us compare this with earlier treatments of the positive. The approaches known to me may be characterized as follows. The positive is the basic notion. The comparative is derived from the positive via universal quantification over contextually given delineations (Lewis (1972), Kamp (1975), Klein (1980)). A delineation $s+_c$ for 'tall' separates the tall objects from the not-tall objects. We can define tall(c) as the set of objects that are at least $s+_c$—tall. Obviously, we need a different delineation $s-_c$ for the polar opposition 'short'. Given the two delineations, the comparative can be defined

[9] Chomsky (1986).

as an appropriate quantification over contexts. For example, the comparative would be this:

(30) Ede is taller/shorter than Mary iff
$(\forall c)[\text{Mary} \in \text{tall/short}(c) \rightarrow \text{Ede} \in \text{tall/short}(c)]$
$\&\ (\exists c)[\text{Ede} \in \text{tall/short}(c)\ \&\ \text{Mary} \notin \text{tall/short}(c)]$

A theory of this kind is possible, but it requires 'monstrous' quantification over contexts and is conceptually complicated. The concept 'monster' is understood in the sense of Kaplan (1979).

The positive and the comparative apply to the AP and are in complementary distribution: Cresswell (1976), Stechow (1984a), Bierwisch (1987), Kennedy (2001), among others. Stechow (1984b: p. 60) assumes for each degree adjective a contextually given comparison class C, and states the truth-condition for a simple positive statement as follows:

(31) $\text{Pos}_C\ \lambda d.\text{Ede is d-tall iff } (\exists d)[\text{Ede is d-tall } \&\ d > \text{average}(C)]$

Suppose C is the set of men. Then *average(C)* is the size of the average man, whatever that may be. It is clear that this approach can work only for the positive pole of the adjective. The negative pole requires a different operator, which gives us a degree *below* the average:

(32) $\text{Neg}_C\ \lambda d.\text{Ede is d-short iff } (\exists d)[\text{Ede is d-short } \&\ d < \text{average}(C)]$

So no unified account of the meaning of the positive is possible in this theory.

A simpler account of these kinds of theories assumes a contextually given standard s for tallness.[10] The sentence 'Ede is tall' may then be analysed as:

(33) $\exists d[\text{Ede is d-tall } \&\ d \geq s]$

So $\text{Pos}_s := \lambda A.\exists d[A(d)\ \&\ d \geq s]$. Again, this only works for the positive pole. The negative pole needs a second standard s′ and a second operator $\text{Neg}_{s'} = \lambda A.\exists d[A(d)\ \&\ d < s]$. All these approaches must therefore have access to an ordering relation $>$ and its converse $<$. The degree semantics given here doesn't have access to either of these relations for compositionality. Our operator fits the architecture of the semantics of antonyms very naturally.

A semantics for the positive that comes close to my proposal is found in Kennedy (2001). Kennedy's approach to the semantics of degrees is, however, different. His degrees are intervals. Positive degrees are finite initial segments of a scale, and negative degrees are proper final segments of a scale. Adjectives are measure functions that assign individuals a unique degree. Positive poles assign positive degrees and negative poles assign negative degrees. Thus

[10] For a semantics of this kind, see Meier (2003b) among others.

tall(**Ede**) is a unique degree that corresponds to the height of Ede;[11] **short**(**Ede**) is the complement of this interval. The positive operator converts this degree into a truth-value. $\mathbf{Pos_s}$ **tall**(**Ede**) is true iff **tall**(**Ede**) $\geq$ s and $\mathbf{Pos_{s'}}$ **short**(**Ede**) is true if **short**(**Ede**) $\geq$ s′, where s and s′ are the contextually given standards for tallness and shortness respectively; s′ and s correspond exactly to the left and the right border of my neutral interval. So this approach seems equivalent to mine. Kennedy has to add, however, the stipulation that the positive standard s is always higher on the scale than the negative standard s′. If the neutral zone is an interval, we don't need this stipulation. My semantics for the positive operator encounters none of the difficulties mentioned. It is a unified account and empirically adequate.

Monika Rathert asked me how *sehr* 'very' is treated in this approach. The 'very' interval must be a superinterval of the neutral interval of $N(S)$ that symmetrically includes both bounds of $N(S)$; *very* stands in complementary distribution with the **Pos**-operator.[12]

(34) $\mathbf{very_N}\lambda$**d.short**(**d**)(**Eva**)

The following lexical entry states the meaning of **very**:

(35) $[\![\mathbf{very_N}]\!]^c = \lambda A_{dt}$:c specifies an Interval I that symmetrically includes $N(S_A)$ and is considerably bigger than $N(S_A)$. $(\forall d \in I)A(d)$.

The reader may check for himself that this semantics gives the correct readings for **not very short**, **not very tall** and **neither very short nor very tall** as well. The fact that we can express the meaning of **very** so easily supports the present approach to the positive.

9.4 Introducing tense

Up to now we have been neglecting tense. The adjectives *früh* 'early' and *spät* 'late' obviously have to do with time. Let us therefore introduce time dependency. I will assume that the temporal argument of a predicate is the last one that is saturated by functional application. As I said earlier, the logical type of times is i. Therefore, the logical type of degree adjectives e(dt) is changed into the more complicated type e(d(it)), and the semantics for the tensed version of degree adjectives is as follows:

[11] It is our interval LENGTH(λd.HEIGHT(Ede) $\geq$ d).

[12] As it stands, the semantics for 'very' is not compatible with the iteration *very very* .... Intuitively, there is a scale of nested intervals *Pos*, *very*, *extremely*. Extremely can be expressed by *very very* or *very very very*. So there remains work to be done to get the facts right.

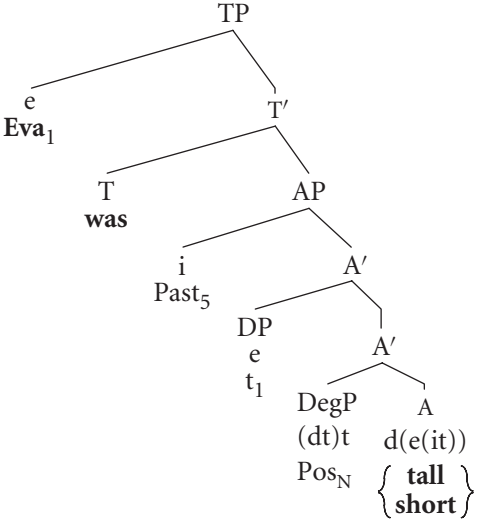
(36) Tensed degree adjectives, type d(e(it))
$[\![\textbf{tall}]\!] = \lambda d.d \in S_{tall}.\lambda x \in D_e.\ \lambda i \in D_i.\ HEIGHT_i(x) \geq d$
$[\![\textbf{short}]\!] = \lambda d.\ d \in S_{tall}.\lambda x \in D_e.\ \lambda i \in D_i.\ HEIGHT_i(x) < d$
$HEIGHT_i(x)$ = the height of x at time i

I will assume a referential theory of tense; cf. Heim (1994), Kratzer (1998b), but the choice is not really important. Most other theories of tense that are on the market would do as well.

(37) $[\![\textbf{Pres}]\!]^c = t_c$ (the speech time)
$[\![\textbf{Past}]\!]^c = \lambda i{:}i < t_c.i$

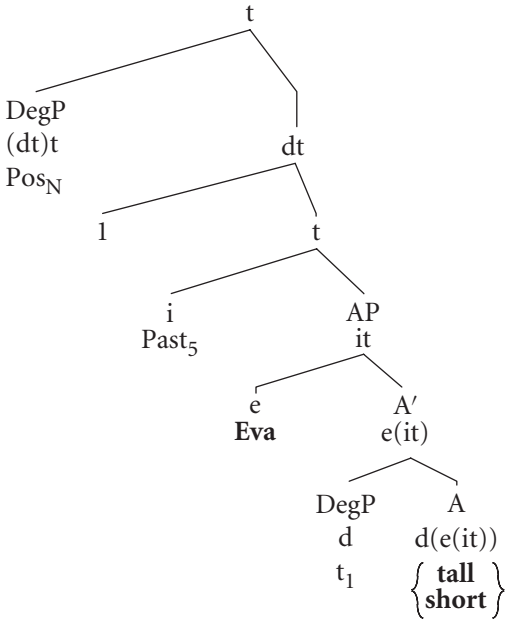
In other words, $[[\textbf{Past}]]^c$ is a functor that restricts the denotation of its argument, a temporal variable i; i has to be before the speech time; cf. Heim (1994). The argument of **Past** will be represented as a free temporal variable, whose value is determined by the contextually given assignment function g. If **n** is a variable of type i, we will mostly write $\textbf{Past}_n$ for **Past**(**n**). Here is a tensed LF for a simple sentence:

(38) Eva was tall/short. (SS)



The copula **was** is semantically empty and is therefore deleted at LF by Chomsky's Principle of Full Interpretation. The positive operator has to be QR-ed for type reasons. The subject **Eva** is reconstructed to its base position. This construal gives us the following transparent LF:

(39) Eva was tall/short. (LF)



($\forall$d $\in$ N(S$_{tall}$)) HEIGHT$_{i5}$(Eva) $\geq$ d (or '$<$ d' if the adjective is **short**)

We are now prepared to introduce the temporal adjectives *früh* 'early' and *spät* 'late'.

9.5 *früh* 'early'/*spät* 'late'

Let us transfer the semantics of degrees to the temporal adjectives *spät/früh* 'late/early'. The analytic idea is that *spät* 'late' is the positive and *früh* 'early' is the negative pole. This is obvious from the fact that German temporal questions use the adjective 'late' and not 'early':

(40) a. Wie spät ist es?
how late is it
'What is the time?'

b. #Wie früh ist es?
how early is it

Times play a double role: since they are ordered, they may play the role of a temporal degree: t $>$ t′ if t is later than t′. On the other hand, qua location on the time axis, a time may also play the role of the subject of the adjective. So, what does 'late' mean? Suppose this adjective did relate an event e to the degrees with respect to which e is late. The first difficulty we encounter is that

the semantics for polar adjectives requires a scale with a beginning, but the time stretch has no beginning (or one in a remote past which is not relevant for the meaning of the adjectives). So we must assume a contextually given final segment I of the time scale T. The relevant degrees are obviously the time points in the interval I. Analogous to a degree adjective like 'tall', the lexical entry for 'late' is expected to be the following:

(41) $[\![\textbf{spät}_I]\!] = \lambda d{:}d \in I \,\&\, I$ is a proper final segment of $T.\lambda e \in D_v.\lambda i \in T.$ $TIME(e)(i) \geq d$. (first attempt)

TIME is a measure function that assigns each event e its temporal degree. What is that? It couldn't be the duration of e. If we say of two events e_1 and e_2 that e_2 is later than e_1, we don't mean that e_2 has a longer duration than e_1. Rather we mean that e_2 occurs at a later time than e_1. We obtain this result if we say that the running time of e_2 is after the running time of e_1. The standard notation for the running time of an event e is $\tau(e)$.[13] Therefore, we can rewrite the rule in the following way:

(42) $[\![\textbf{spät}_I]\!] = \lambda d{:}\ d \in I \,\&\, I$ is a proper final segment of $T.\lambda e \in D_v.\lambda i \in T.$ $\tau(e)(i) \geq d$. $(TIME = \tau)$

Since the running time of e is the same for each time, we can omit the time argument of the τ-function. Recall further that degrees of lateness are times. Therefore, we can replace the degree argument by a time argument and rewrite the rule in a simpler way as:

(43) $[\![\textbf{spät}_I]\!] = \lambda i{:}\ i \in I \,\&\, I$ is a proper final segment of $T.\lambda e \in D_v.\ \tau(e) \geq i$. (simplification)

A problem with this rule is that it is not clear how to hook up the event time to the reference time, which is given by the tense of the sentence. We are assuming a framework in which an aspectual operator like perfective (PF) maps the event time into a reference time (see below). In other words, the temporal localization of the event is not performed by the adjective 'late' but by an aspectual operator. But then 'late' can simply denote a two-place relation that applies to the reference time and its temporal degrees of lateness. Hence our entry for the adjective 'late' is the following.

(44) 'late': type i(it) (official rule)
$[\![\textbf{spät}_I]\!] = \lambda i{:}\ i \in I \,\&\, I$ is a proper final segment of $T.\lambda i' \in I.i \geq i'$.

The first time argument – the object – plays the role of the degree of lateness; the second time argument – the subject of the adjective – is the reference time of the sentence. We are now in a position to analyse the following sentence (which has kept puzzling me for a long time):

[13] Cf. Krifka (1989) among many others.

(45) Es war spät. 'It was late.'
Pos$_N$ λ_2 [Past$_5$ t$_2$ late$_I$]
$(\forall t \in N(I))$ Past$_5$ $\geq$ t
I: |.....(.....) .....Past$_5$.....> ∞
early N(I) late

This means that the reference time is in a contextually determined time span I but after the neutral time interval $N(I)$, which counts as neither early nor late.

The negative pole *früh* 'early' is of course defined in terms of internal negation, i.e. $[\![\textbf{früh}_I]\!] = \neg[\![\textbf{spät}_I]\!]$. Therefore, the sentence

(46) Es war früh. 'It was early.'

means that the reference time is before the neutral time $N(I)$. I leave it to the reader to check for himself that the sentences involving negation all get the correct reading:

(47) a. Es war nicht spät. 'It was not late.'
b. Es war nicht früh. 'It was not early.'
c. Es war weder früh noch spät. 'It was neither early nor late.'

The surface syntax of (45) might be something like this:

(48) [$_{TP}$ **es** [$_{T'}$ **war** [$_{AP}$ Past$_5$ [$_{A'}$ Pos$_N$ **spät$_I$**]]]]

The semantically empty expletive **es** and the copula **war** are deleted by the Principle of Full Interpretation, Pos$_N$ is QR-ed for type reasons. This yields the transparent LF.

9.6 Temporal adjectives as adverbs

In comparative constructions, our temporal adjectives are used as adverbs. So we have to say something about the interpretation of the adverbial construction. The default interpretation for modification is set-theoretical intersection. *Cecile is a charming woman* means that Cecile has the property of being a woman and of being charming. Similarly, *Alla came late* means that a particular past time has the property of being late and of being the time containing a coming of Alla. This sounds simple but is somewhat tedious to spell out.

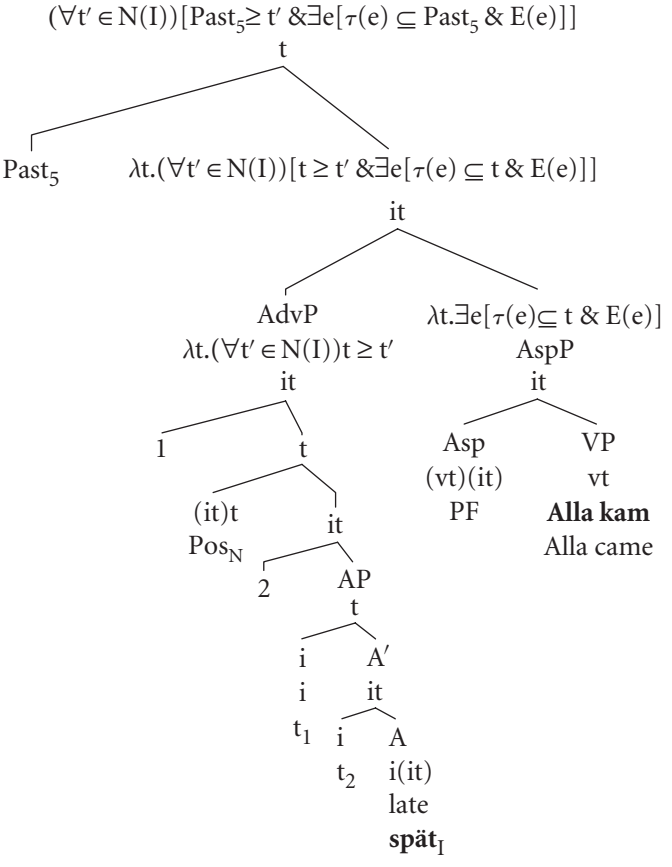
Here is first what the perfective aspect does: it says that the event time is included in the reference time[14]:

[14] This is the standard meaning for the perfective. See Krifka (1989) and Klein (1994) among many others.

(49) Perfective aspect:type (vt)(it)
$[\![PF]\!] = \lambda E.\lambda i.\exists e[E(e) \,\&\, \tau(e) \subseteq i]$.

The sentence *Alla kam spät* 'Alla arrived late' would then have the following LF, where 'E' stands for Alla's coming:

(50) 'Alla came late.' (LF)



This can be paraphrased as 'The time of an arrival of Alla is at least as late as every time in the neutral interval'. Note that the AdvP and the AspP are combined via the intersection rule, that is, by what Heim & Kratzer (1998) call Predicate Modification.

(51) I |----------[/////////////]----[--e--]---------->
N(I) Past5

In this picture, 'e' stands for the event of Alla's coming. The surrounding bracket denotes the reference time, that is, the denotation of $Past_5$.

9.7 *Früher* 'earlier'/*später* 'later'

The application of the usual comparative semantics to our temporal degree adjectives is straightforward now. I will adopt Heim's formulation (Heim (2001)) of the comparative and equative, which is inclusion between sets of degrees. Consider first the analysis of *John was taller than Mary*. The LF is as follows:

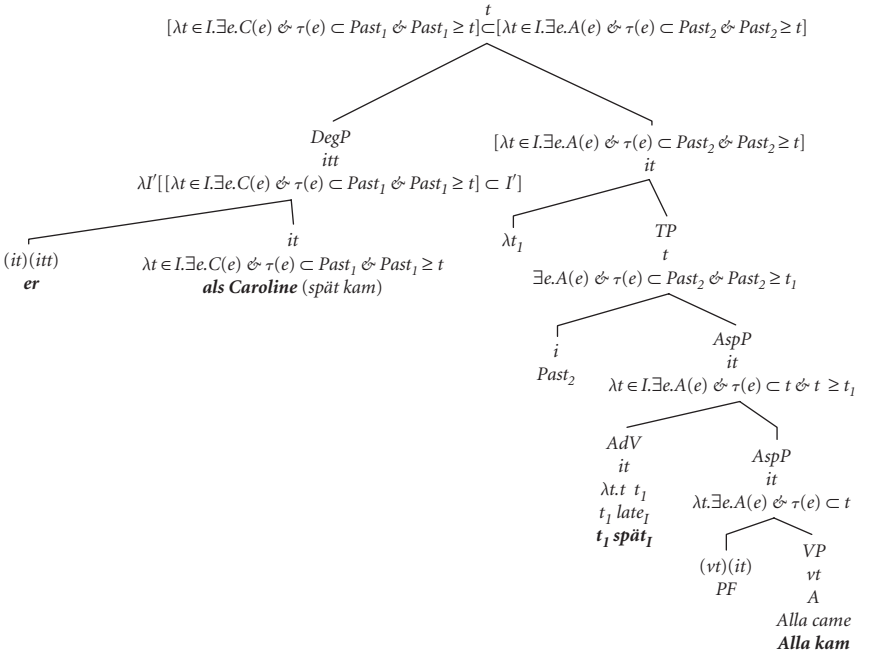
(52) John was taller than Mary.
-er [λd. Mary d-tall at $Past_5$] ⊂ [λd. John d-tall at $Past_5$]

The LF is constructed in the usual way. For convenience, I give the meaning rule for the comparative.

(53) Comparative morpheme
⟦ -**er** ⟧ = $\lambda P_{dt}.\lambda Q_{dt}.P \subset Q$.

To facilitate the reading, I give the LF for a temporal comparative in greater detail:

(54) Alla kam später als Caroline. 'Alla came later than Caroline.'



Note that it is essential that the two semantic tenses in the construction are different. One indicates the time of Alla's coming, the other that of Caroline's

coming. The two tenses are the upper limits of the intervals that are compared. Here is a picture, which illustrates that the truth-condition given by the LF is correct.

(55) I: |.....[Past_1].....[Past_2].....> ∞
++++++++++++++ time up to Caroline's coming
++++++++++++++++++++++++ time up to Alla's coming

Früher 'earlier' is, of course, analysed in exactly the same way as APs that have **¬spät** as their head. The reader may check for himself that the following equivalences are predicted by our semantics.

(56) Caroline kam früher als Alla ↔ Alla kam später als Caroline
Caroline came earlier than Alla ↔ Alla came later than Caroline

If we now assume Ladusaw's theory of NPI-licensing (Ladusaw (1980)), the occurrence of NPIs in the complements of *früher/später* is explained because the comparative induces a downward entailing context. It doesn't matter whether we consider the positive or the negative pole of the pair.

9.8 Differentials

It is always important to ask whether differentials can be integrated into a semantics of comparison. Here are two examples:

(57) a. Alla ist (um) 5 cm größer als Ede.
Alla is (by) 5 cm taller than Ede.

b. Alla kam 5 Minuten später als Caroline.
Alla came 5 minutes later than Caroline.

It is pretty obvious what these mean: subtract the measurement that corresponds to Ede's height from the measurement that corresponds to Alla's height. The result must be a measurement of a length of 5 cm. This is the meaning of sentence (a). Similarly for (b): subtract the time up to Caroline's coming from the time up to Alla's coming. The result should be an interval of 5 minutes in length.

The differential phrase is presumably best analysed as a PP that modifies the comparative morpheme. For sentence (57a), the following meaning rule would do:

(58) $[\![[_{\text{PP}}\ \textbf{by}\ \ 5\ \ \textbf{cm}]]\!] = \lambda R_{(\text{dt})((\text{dt})\text{t})}\colon\ \ R = [\![\textbf{-er}]\!].\lambda D_{\text{dt}}.\lambda D'_{\text{dt}}.R(D)(D')\ \ \&$
$\text{LENGTH}(D' - D) = 5\ \text{cm}$

The LF for (57a) is the following formula:

(59) **[by 5 cm er]** [λ**d. tall(d)(Ede)(Pres)**][λ**d. tall(d)(Alla)(Pres)**]]
= λd.HEIGHT$_{\text{Pres}}$(Ede) $\geq$ d $\subset$ λd.HEIGHT$_{\text{Pres}}$(Alla) $\geq$ d
& LENGTH(λd.HEIGHT$_{\text{Pres}}$(Alla) $\geq$ d $-$ λd.HEIGHT$_{\text{Pres}}$(Ede) $\geq$ d) = 5 cm

The analysis for (57b) proceeds in a parallel manner and is left to the reader.

9.8.1 *Summary*

I have interpreted the temporal adjectives 'early' and 'late' as degree adjectives and I have shown that the analysis accounts for some hitherto puzzling phenomena. I started with the observation that 'earlier'/'later' require a comparative analysis. Both comparative adjectives license NPIs in their complements. The adjectives engender two puzzles in connection with phase adverbs, which I dubbed the Type-1 Puzzle and the Type-2 puzzle.

The particular ingredients of my analysis are these:

1 Every scale of degree is contextually restricted to an interval *S* that might be called the frame of the adjective. The context determines a function *N* that gives us the neutral degrees within *S*.

2 I have introduced a new positive operator *Pos*, which is a universal quantifier over degrees that is restricted by $N(S)$. This operator works equally well for the positive and the negative pole of an antonym pair.

3 I gave a semantics for the temporal adjectives 'early' and 'late' in terms of times as degrees. Times play a double conceptual role here. Qua subjects of the adjectives, they are locations on the time axis, qua objects they are degrees; 'early' expresses the temporal relation $<$, 'late' expresses the relation $\geq$.

4 I analysed the comparative adjectives 'earlier'/'later' in the standard way and showed that NPIs are licensed in the complement. The analysis is not entirely trivial because we have to consider adverbial uses of the two adjectives. This necessitates the introduction of the perfective operator.

As a final remark I have to add some caveats. The semantics of adjectives on which my proposal is based is rather conservative. It works for the purposes discussed in this chapter, but it cannot explain the scope puzzles arising with quantifiers in comparative clauses, which have been discussed in Schwarzschild & Wilkinson (2002), Heim (2001), Heim (2003), among others. For instance, why does the quantifier *everyone of us* in *Irene is more intelligent than everyone of us is* have wide scope with respect to the comparative operator? For equatives, the present semantics can't even express the correct truth-condition for a sentence like *Eva is as pretty as no one of us is* (= Eva is prettier than

everyone of us). A treatment of these requires more elaborate methods. I think that the perspective opened in Schwarzschild & Wilkinson (2002) will ultimately turn out to be the most promising one: the adjective 'tall' doesn't relate Ede to the degrees d to which Ede is tall, but to the sets D of degrees that contain Ede's height. Such an account will complicate the issues considerably and will lead to a revision of the semantic rules presented here. I think that the main results obtained in this chapter for the positive and the comparative can be retained under revisions of the approach, but we will have to say something different about the equative. These issues are topics for another chapter.

10

On (in)animate noun phrases[1]

HELEN DE HOOP

'Small people talk about people, average people talk about events, great people talk about ideas.'

10.1 Introduction

The above philosophical saying has been challenged by linguists, who instead say: 'All people talk about people.' Indeed, statistical studies of spoken language have shown that the subject of most sentences is human, or at least animate. For example, Dahl (2000) reports that in a corpus of spoken Swedish about two thirds of all subjects are animate. Not only do people preferably talk about living creatures, they also expect other people to do so. Psycholinguistic research has revealed that there is a strong preference for sentences that begin with an animate noun phrase, both in production and perception (Bock & Warren (1985), Weckerly & Kutas (1999)). The same principle, dubbed 'Animate First', has been proposed in functional typology to account for cross-linguistic word order preferences (Tomlin (1986)).

In this chapter I hypothesize that the animacy of noun phrases affects their 'prominence', and that in that sense animacy is comparable to definiteness. 'Prominence' is best known as a functional-typological notion that plays a role in voice alternations (cf. Givón (1994), Aissen (1999)). As such, it is determined by a range of different factors, including definiteness and/or referentiality, animacy, person, topichood. An argument can be prominent due to its inherent properties or because of its status in the discourse (de Swart

[1] I thank the Netherlands Organization for Scientific Research (NWO) for their financial support of this research (grants no. 360-70-220 'Animacy', 220-70-003 'Case cross-linguistically', and DN 30-609 'Incremental interpretation of case and prominence'). I am most grateful to Andrej Malchukov, Monique Lamers, and Peter de Swart for various illuminating discussions on animacy and for providing me with data and references. Thanks also to the audience in Saarbrücken, to the editors of this volume, and to the anonymous reviewer for their useful questions and comments.

(2007)). Definite noun phrases can be argued to be prominent, but not all definites are equally prominent (Anagnostopoulou & Giannakidou (1995)). The same holds for animate noun phrases, which led to the introduction of so-called 'prominence hierarchies' or 'prominence scales' (e.g. Silverstein (1976), Comrie (1989)). Notoriously, animacy and definiteness play a similar role in the domain of differential object marking (Aissen (2003)). A question related to the theme of the present volume is whether this similarity in prominence between the two features is also reflected in a similarity in DP structure. Danon (2006), for example, argues that syntactically definite objects require a morphological case marker in Hebrew because they have a DP projection which bare nominals lack. Danon suggests that in languages other than Hebrew the phenomenon of differential object marking can also be seen as an indirect reflection of a difference in the syntactic structure of the noun phrase.

However, while definiteness can be conceived of as a feature related to the syntax of noun phrases, animacy is a feature related to the individuals (in the world or discourse) that the noun phrases refer to. As Danon (2006) correctly points out, it would be rather unrealistic to assume that (differential) object marking triggered by the animacy of the noun phrase could be reduced to the presence of a DP layer, too. Therefore, apart from striking similarities between animacy and definiteness in certain linguistic phenomena such as differential object marking, we predict certain differences between animacy and definiteness as well. In this chapter, I will argue that this prediction is indeed borne out.

In order to investigate these similarities as well as differences between animacy and definiteness, I will focus on the phenomenon of differential object marking in natural language, which is well known to be related to either animacy or definiteness or both (Aissen (2003)). In section 10.2, I will introduce this domain of investigation and immediately point out a crucial difference between definiteness and animacy. In section 10.3 I will further explore the idea of animacy as a matter of prominence, which can also be used to explain certain similarities between animacy and definiteness. Then, in section 10.4, I will tentatively propose that there is a difference between preferred (basic) interpretations of animate versus inanimate noun phrases. This can be captured by a (violable) constraint of basic interpretations. Naturally, the preferred interpretation can alter when the constraint on basic interpretations is overruled by certain conditions in the context, as has been proposed for preferred interpretations of definite and indefinite noun phrases as well. Section 10.5 presents the conclusions of this chapter.

10.2 Differential object marking

As argued by Aissen (2003), when a language distinguishes between two types of case marking on objects, very often the object that receives accusative case is higher in animacy or definiteness or both than the object that does not receive case. For example, in Malayalam animate objects receive accusative case (1) whereas inanimate objects do not (2) (Asher & Kumari (1997)).

(1) Avan oru paʃuvine vaaŋŋi.
he a cow-ACC bought
'He bought a cow.'

(2) ŋaan teeŋŋa vaaŋŋi.
I coconut bought
'I bought some coconut.'

In (1) the animate noun 'cow' is marked with accusative case, while the inanimate noun 'coconut' does not receive accusative case. The intuitive idea behind this phenomenon of differential object marking is that subjects are usually animate (and definite) while objects are usually inanimate (and indefinite), and that an animate (definite) object is therefore semantically 'marked' (an animate/definite object is not a typical object) and requires to be morphosyntactically (case-)marked as well (Comrie (1989), Aissen (2003)). This relation between semantic markedness of the object and case marking holds for animate objects as well as for definite/specific ones, as the examples from Hindi in (3) and (4) below show (Mohanan (1990)):

(3) Ilaa-ne haar uThaayaa.
Ila-ERG necklace lifted
'Ila lifted a necklace.'

(4) Ilaa-ne haar-ko uThaayaa.
Ila-ERG necklace-ACC lifted
'Ila lifted the necklace.'

The motivation for case-marking only animate or definite/specific transitive objects, as witnessed in Malayalam and Hindi above, could be a principle of distinguishability or to 'avoid ambiguity': objects that are animate or definite/specific are more 'subject-like' and therefore they need accusative case marking in order to make sure that they are correctly identified as the object of the transitive clause (Aissen (2003), among others). To put the general motivation behind this type of case marking in a constraint (de Hoop & Lamers (2006)):

(5) DISTINGUISHABILITY: The two arguments of a transitive clause should be distinguishable.

Case marking is one way to distinguish between the subject and the object and hence to satisfy the above constraint. However, if the subject and object are otherwise distinguishable, then case marking is not necessary to satisfy DISTINGUISHABILITY; it would become redundant. In Awtuw the object is obligatorily marked with accusative case if the object is equally high or higher than the subject in the animacy hierarchy (Feldman (1986)):

(6) Tey tale-re yaw dæli.
3fs woman-ACC pig bit
'The pig bit the woman.'

(7) Tey tale yaw dæli.
3fs woman pig bit
'The woman bit the pig.'

Thus, in (6) the object is marked with accusative case because, unexpectedly, it outranks the subject in animacy (where human ≫ animate ≫ inanimate, cf. Comrie (1989)). If there is no case marker, as in (7), *the woman* is automatically interpreted as the subject and *the pig* as the object, in accordance with the generalization that subjects outrank objects in animacy. But if the object is more 'subject-like' (absolutely or relatively), that is, if it equals the (general or actual) subject in animacy/definiteness, the subject and the object can no longer be distinguished on the basis of these animacy/definiteness properties. In order to satisfy the constraint DISTINGUISHABILITY and to avoid *potential* ambiguity, case marking can apply.

However, as pointed out in de Hoop & Malchukov (2007), this is not always the best explanation for the pattern of differential object marking. Consider for example the pattern in Central Pomo, where accusative case is locally (that is, independently of the case of the subject) assigned to human objects only (Mithun (1991), who calls this 'patientive' case):

(8) M'u·tu ?a·hk'úm.
he.ACC I.killed
'I killed him.'

(9) Mu·l ?a·hk'úm.
he I.killed
'I killed it (the bee).'

In principle, the pattern in (8)–(9), where only the human object is case-marked, could be explained along the lines set out above. However, the

problem is that this type of differential case marking in Central Pomo carries over to intransitive subjects as well:

(10) Q'alá·w m'u·tu.
died he.ACC
'He died.'

In (10) the subject of the intransitive clause is a patient and when it is human it gets the same case marking as the object of the transitive clause in (8). The case marking in (10) cannot be explained by a mechanism that assigns case to the object when it might get confused with the subject. Obviously, since (10) is an intransitive clause, there is only one argument available and therefore no potential danger of ambiguity. That is, although differential object marking can sometimes be explained along the lines of distinguishability between subject and object, this does not always seem to be the best explanation. Sometimes, only objects which are human or animate are case-marked, but the reason is not that they might get confused with the subject otherwise.

Besides, if differential object marking were to be attributed to a principle of distinguishability (that is, to avoid ambiguity as to what is the subject and what is the object), then we would expect to find differential subject marking along the same lines. This prediction is actually borne out in some languages, such as Qiang (a Tibetan language), where the subject in a transitive clause only takes agentive case when it is inanimate (LaPolla & Huang (2003)).

(11) MoVu-wu qa da-tuə-Z.
wind-AGT 1sg DIR-fall.over-CAUS
'The wind knocked me down.'

However, although in such examples of case marking only inanimate subjects exist, as illustrated above, this is not a very common trigger for differential subject marking (de Hoop & Malchukov (forthcoming), de Hoop & Malchukov (2007)).

Finally, in certain contexts the alternation is not between case-marking the object or not, but between two different types of objective case. For example, in Finnish, partitive case and accusative case may correspond to a difference in definiteness, as illustrated below:

(12) Anne tapaa vieraita.
Anne meets guests-PART
'Anne meets some guests.'

(13) Anne tapaa vieraat.
Anne meets guests-ACC
'Anne meets the guests.'

In this case, both objective cases differ from the nominative case-marked subject, hence the differential object marking cannot be explained in terms of distinguishability between subject and object. Clearly, a meaning alternation is involved between the two types of case, which is more fine-grained than the difference between interpreting a noun phrase as the subject or as the object.

To sum up, a case alternation on the object of a transitive sentence could be motivated by distinguishability, that is, the need to distinguish the object from the subject. However, there are certain clear cases, as pointed out above, where distinguishability cannot be the motivating factor for a difference in case assignment. This holds both for a differential object-marking pattern on the basis of animacy, as in (8)–(9), as for a differential object-marking pattern on the basis of definiteness, as in (12)–(13).

Note that, although both animacy and definiteness can trigger differential object marking for other reasons than distinguishability between the subject and the object, as illustrated in this section, there is a clear difference between animacy and definiteness as well. The difference lies in the relation between the form alternation and the meaning difference. To see this, reconsider the pair of sentences (3)–(4) above, repeated below.

(14) Ilaa-ne haar uThaayaa.
Ila-ERG necklace lifted
'Ila lifted a necklace.'

(15) Ilaa-ne haar-ko uThaayaa.
Ila-ERG necklace-ACC lifted
'Ila lifted the necklace.'

In (14) and (15) the object noun phrase that receives differential case marking has the same form *except for the case marking*. As a consequence, the case alternation triggers the difference in meaning; the noun *necklace* is interpreted as *the necklace* when it bears accusative case, and as *a necklace* otherwise. The same holds for the case alternation in (12)–(13) above. That is, dependent on whether it bears partitive or accusative case, the noun *guests* in (12) and (13) denotes some non-specific or *the* guests, respectively.

By contrast, when differential object marking is triggered by a difference in animacy (whether or not in relation to the animacy of the subject), one type of case is used for one type of noun phrase, the other for another, as in the pair (1)–(2), repeated below.

(16) Avan oru paʃuvine vaaŋŋi.
he a cow-ACC bought
'He bought a cow.'

(17) ɲaan teeɲa vaaɲɲi.
I coconut bought
'I bought some coconut.'

As a consequence, the accusative case marker does not actually trigger or *change* the animacy of the cow in (16), nor does the lack of case. However, the individual that is animate in (16) must carry accusative case when it functions as the object, while the inanimate coconut does not receive case.

Although there are instantiations of differential object marking on the basis of definiteness that are similar to this pattern of differential case marking on the basis of animacy (for example, noun phrases with a definite article are case-marked in Hebrew, while noun phrases without a definite article are caseless, cf. Aissen (2003)), as far as I know this does not hold the other way around. That is, there are no instantiations of differential object marking based on animacy, where the same noun gets interpreted as animate when it has one type of case and as inanimate when it has another type of case. Hence, although superficially animacy and definiteness seem to behave alike with respect to differential object marking, they in fact differ in this crucial aspect.

10.3 Animacy as a matter of prominence

In this section I would like to argue that animacy contributes to the prominence of a noun phrase. Although animacy is not a linguistic category, it clearly *affects* language in multiple ways.[2] Yamamoto (1999) investigates animacy for the choice of reference mode (full noun phrases, pronouns, zero anaphora, etc.). There are languages, such as Japanese, where the subject of a transitive sentence is not allowed to be inanimate (Jacobsen (1992)). In other languages the restriction is not absolute but present as a strong tendency. For instance, 92% of the transitive subjects found in the Swedish corpus referred to above were animate (Dahl (2000)). Some languages (like Algonquian) distinguish agreement with animate and inanimate arguments (cf. Bloomfield (1956) on Ojibwa). Restrictions on derived voice patterns are also found. For example, in Tungusic passives are only possible with animate subjects (Malchukov (1993)).

There happen to be more similarities between animacy and definiteness of noun phrases than in the domain of differential object marking pointed out

[2] Anastasia Giannakidou (p.c.) points out that animacy is reminiscent of the category of gender/sex in the sense that sex is also a physical category, but it has a linguistic counterpart, gender. Animacy, unlike sex, however, does not have a clear-cut linguistic counterpart.

in the previous section. We also find similarities with respect to noun phrase incorporation, number marking, and word order variation. At first sight, these similarities between animacy and definiteness with respect to different linguistic phenomena do not straightforwardly follow from their syntactic or semantic properties. As mentioned already in the introduction, a syntactic difference between NPs and DPs could explain a difference in case marking in relation to definiteness, but not for animacy. Animacy is usually conceived of as a semantic feature rather than a syntactic one. In this section I will argue that animacy and definiteness both contribute to the status of the noun phrase in the discourse, that is, to its prominence. Another factor that reflects the prominence of noun phrases is their word order. I will briefly examine the interaction between word order and animacy in the next section.

With respect to the concept of animacy, three categories of animacy are usually distinguished (e.g. Comrie (1989)):

HUMANS ≫ ANIMALS (ANIMATES) ≫ INANIMATES

One may observe different cut-off points in different languages. Comrie (1989) discusses a certain case form in Slavic languages that was first used only for male, adult, freeborn, and healthy humans (and not for women, children, slaves, and cripples), and only later spread to all humans. In Ritharngu, kangaroos and dogs belong to the same category as humans, but other animals do not (Heath (1980)). Of course, some animals are not literally more animate than others, but in our perception of the world they are closer to human beings. Kuno (1987) uses the term *humanness hierarchy* instead of *animacy hierarchy* and argues, following Kuno & Kaburaki (1977), that the humanness hierarchy derives from *empathy* considerations, where *empathy* measures the degree of the speaker's identification with the relevant discourse participants.

In some treatments, the animacy hierarchy is extended to include the person hierarchy. At first sight, this makes sense, since first and second person are almost exclusively animate. Animacy, person, and also definiteness, show correlations that could be captured by a comprehensive notion such as *empathy*, *topicality*, or *discourse prominence*. Yet, the danger of a fusion between different types of scales is that one cannot be certain anymore about which factor underlies a certain grammatical phenomenon (Dahl & Fraurud (1996)). Therefore, I choose to consider both animacy and definiteness as factors of prominence, but without mixing them into one integrated scale of prominence.

Although definiteness and animacy both can be seen as inherent prominence properties of noun phrases, they do differ in what level of prominence they actually affect. Animacy refers *directly* to the properties of the (discourse)

referents (that is, the individuals the noun phrases refer to). By contrast, a definite article does not reflect an inherent property of the individual; it merely reflects its role or status in the discourse (that is, it is supposed to be unique or familiar (discourse-old); see also McNally (this volume), and Farkas & de Swart (this volume)). *Marking* animacy itself would be redundant and languages in general lack markers of animacy. Obviously, while a definite article marks a noun phrase as definite, there is no such thing that marks a noun phrase as animate. That is, the individual referred to by the noun phrase *is* or *is not* animate irrespective of the linguistic expression that is used. This sheds light on the difference between animacy and definiteness in the domain of differential case marking as pointed out in the previous section. In fact, we may say that the accusative case marking can function as a definite article, in the sense that it marks a noun phrase as definite or specific, but that does not hold for accusative case marking as a marker of animacy. The case alternation may be dependent on a difference in animacy, such that accusative marks animate noun phrases, but it cannot mark a noun phrase *as* animate. That is, case cannot change the animacy properties of the noun phrase, while it can change its definiteness (see also de Swart (2007), and de Swart & de Hoop (2007)).

It is common knowledge in typology that animacy is a 'hidden' or 'covert' category, as it is not overtly marked. Because of its relevance across a wide range of languages, animacy is viewed as a *meaning constant* which exists independently of its realizations in any particular language, independent of particular linguistic or cultural bias (Comrie (1989), Pencheva (1992)). In formal semantic theories animacy has been almost completely ignored. This is not surprising, since animacy is not a linguistic but an ontological (or rather, maybe conceptual) category, that is, a property of the individuals in the real world or the discourse (Dahl & Fraurud (1996)). Thus, while definiteness adds meaning to a noun (see also Farkas & de Swart (this volume)), animacy does not. Instead, animacy simply pertains to the properties of the members of the set the noun denotes. Whereas a vast literature deals with the difference between definites and indefinites, as far as I know, no formal linguistic account has ever been offered for the difference between animates and inanimates. In this chapter I will not try to give a formal account of the animacy distinction either. However, I will present a hypothesis concerning the basic interpretation of animate and inanimate noun phrases in the discourse, and how this relates to definiteness.

I believe that animate and inanimate noun phrases differ in their preferred (or basic) discourse role, but that (conflicting) information from the (extra-) linguistic context may drive a shift in interpretation, similarly to what has been

proposed in terms of semantic type-shifting of definite and indefinite noun phrases (van der Does & de Hoop (1998)). Inanimate noun phrases are not typical discourse referents, hence their basic discourse role is *low prominent* rather than *high prominent*. This is in accordance with the fact that subjects generally outrank objects in prominence in the discourse whereas objects tend to be inanimate and non-specific (Comrie (1989)). Also, it might account for the fact that some languages do not extend number marking to inanimates (Corbett (2000)). To say that the basic or preferred interpretation of inanimate nouns is low prominent does not mean that they cannot shift to get a high prominent interpretation. Preferences in interpretation can be phrased as soft (violable) constraints in an Optimality Theoretic framework of interpretation (Hendriks & de Hoop (2001)).

This difference in prominence may be similar to the difference in preferred types that definites and indefinites have. Definites have a natural interpretation in the referential type *e*, while indefinites live more naturally in the predicative type $<e,t>$ (Partee (1987), van der Does & de Hoop (1998)). Definite as well as specific noun phrases are used to talk about a certain subject, that is, they describe certain discourse referents (Dekker (1998)). The hypothesis I would like to put forward here is that animacy can also be mapped onto a scale of discourse referentiality, or prominence.

In de Hoop (1992) a relation is established between referential properties of noun phrases and the type of case they bear. It is argued that strong (quantificational, referential) object noun phrases come with 'strong' case, while weak (predicative, non-referential) ones are licensed by 'weak' case. If we replace 'strong noun phrases' by 'high prominent noun phrases' and the abstract case theory of de Hoop (1992) by a morphosyntactic perspective, we can still link the interpretive difference between definite and indefinite object noun phrases to a difference in case. Recall the minimal pair of Hindi sentences in (3)–(4) above, repeated here once more for convenience (Mohanan (1990)):

(18) Ilaa-ne haar uThaayaa.
Ila-ERG necklace lifted
'Ila lifted a necklace.'

(19) Ilaa-ne haar-ko uThaayaa.
Ila-ERG necklace-ACC lifted
'Ila lifted the necklace.'

The only difference between (18) and (19) is a difference in the absence or presence of the accusative case marking. This case alternation reflects a shift in prominence. The necklace in (19) gets a more prominent reading than the one in (18). The transitive verb *to lift* in (18) and (19) can take either an animate or

an inanimate object. Note, however, that if the object is human, the accusative case marker becomes obligatory (Mohanan (1990)).

(20) Wo bacce-ko / *baccaa uThaataa hae.
he child-ACC / *child lifts is
'He picks up a/the child.'

If the accusative case marker *ko* would just reflect a difference in definiteness, we would expect the accusative marked noun *child* to be interpreted as *the child* and as *a child* otherwise. But, clearly, the human object in (20) is high prominent by itself and does not need the case marker to get a prominent role in the discourse. Even if it is interpreted as non-specific or indefinite, it still describes a prominent discourse referent. Thus, the accusative case marker can shift the interpretation of the noun phrase from non-specific to specific and this corresponds to a shift in prominence, but when the object is high prominent for other reasons, in this case because it is human, the absence of the case marker is not allowed. That is, the accusative case marker does not shift the interpretation of *child* in (16) from inanimate to animate, nor does it shift from non-specific to specific. We can conclude that human objects are high prominent in Hindi and that is why they must bear accusative case. Accusative case thus *reflects* the prominence of the object, but it does not *trigger* it. Also in the case of definiteness, therefore, I assume that when the necklace plays a prominent role in the discourse, it must receive case, while it can only be without accusative case when it is low prominent. Animals and inanimate direct objects can optionally bear case. If they do, they are marked as being high prominent in the discourse; if they do not receive case, obviously they are low prominent in the discourse.

For Hindi, it could be maintained that distinguishability plays a role in case marking, at least with respect to the animacy dimension. In (18) and (19) case marking the object, it is immediately clear that the pronoun must refer to the subject, while the inanimate noun phrase must be the object of *to lift*. Hence, accusative case marking would not be necessary from the perspective of distinguishability, and indeed it turns out to be optional. In (20), on the other hand, the child could in principle be the subject of *to lift* and hence, the accusative case marker can be argued to serve the purpose of distinguishing between the subject and the object. However, the optionality of the case marking in (18) and (19) is only apparent. As has been pointed out, the accusative case marking in (19) does reflect a difference in prominence. Moreover, in other cases differential case-marking patterns on the basis of animacy cannot straightforwardly be explained in terms of distinguishability. Recall the pattern in Malayalam, repeated below:

(21) Avan oru paʃuvine vaaŋŋi.
he a cow-ACC bought
'He bought a cow.'

(22) ŋaan teeŋŋa vaaŋŋi.
I coconut bought
'I bought some coconut.'

In this instance it does not seem to make sense to assume that the accusative case on *cow* helps to distinguish between the subject and the object. Verbs such as *to buy* and *to sell* require a human agent subject and neither the cow nor the coconut would make a good subject therefore. However, it does make sense to assume that a cow plays a more prominent role in the discourse than a coconut, and therefore that it can be a difference in prominence that is reflected by the differential case marking. If the difference between the case-marked object and the caseless object is based on a difference in prominence, rather than on a difference in distinguishability between the subject and the object, then we may expect to encounter inanimate objects that are high prominent to be case-marked as well. Indeed, we find such cases. Inanimate objects of *worship* receive accusative case in Malayalam, as illustrated in (23) (Asher & Kumari (1997)).

(23) Avaḷ ʃilpatte araadhiccu.
she statue-ACC worshipped
'She worshipped the statue.'

Evidently, it would not be very helpful to try to analyse the accusative case marking in (23) in terms of distinguishability, as it is clear that an inanimate object such as a statue cannot be the subject of *to worship*. However, it seems plausible to attribute the occurrence of accusative case in this example to the high prominence an object of worship must have in the discourse.

10.4 Shifts in interpretation

Above it was pointed out that a case alternation can express a shift in prominence. Also, case can shift the interpretation of a noun phrase; in particular it can shift the interpretation from non-specific to specific (cf. McNally (this volume)), but it cannot usually function to shift the interpretation from inanimate to animate. From the hearer's perspective, animacy helps to identify the prominence of the noun phrases, or to determine what discourse referent the speaker is talking about. Speakers mostly talk about animate subjects, but of course, when a speaker wants to talk about an inanimate

entity, say 'the car', she can do that without any problems, although the construction that is used may vary from language to language. In any case, the speaker must choose a form that the hearer will correctly interpret. This may involve the use of a (different) case marker, a different word order, a passive construction, etc.

Above I hypothesized that inanimate noun phrases are preferably interpreted as low prominent, while animate noun phrases are preferably interpreted as high(er) prominent. When an inanimate noun phrase is the subject of a transitive sentence, however, its prominence increases as well, that is, its interpretation may shift to a high prominent interpretation. Take for example the sentence with an inanimate subject below:

(24) The car hit a boy.

In (24) *the car* refers to an inanimate entity which nevertheless is high prominent in the discourse, not only due to the fact that it is the subject but also thanks to its definiteness which makes the inanimate noun phrase in (24) maybe even more prominent than the human indefinite object *a boy*.

The shift in prominence of the car in (24) is clearly not related to a shift in animacy, though. But shifts in animacy occur as well. A well-known example of the latter case is given in (25) (cf. Nunberg (1979)):

(25) The ham sandwich asked for the check.

In (25) *the ham sandwich* is interpreted as the person who ordered the ham sandwich in the context of a restaurant. Because of the predicate, this interpretation is straightforwardly obtained. Now consider the interpretation of (26):

(26) The ham sandwich has eaten the fish.

The verb *to eat* requires an animate subject. In (26) an animate noun phrase is available, namely *the fish*. However, *the fish* cannot be interpreted as the subject in English, due to a strict word order constraint that dictates an SVO order. The interpretation that the fish has eaten the ham sandwich is not possible, therefore. Another possible interpretation could be to allow inanimate individuals to eat, that is, to violate the selectional restrictions of the verb. This type of interpretive shift is sometimes possible as well, but without any further contextual clues it is definitely not the preferred interpretation of (26). Hence, the optimal interpretation that one gets is an interpretation similar to the one in (25) where the inanimate noun phrase *the ham sandwich* is interpreted as referring to a human individual in the discourse. This reading appears to violate a type of faithfulness constraint that requires an (inanimate)

Tableau 10.1 Optimality Theoretic semantic tableau of sentence (26)

The ham sandwich has eaten the fish	Precedence	Selection	Faithfulness
Eat (ham sandwich, fish)		*	
Eat (fish, ham sandwich)	*		
☞ Eat (ham sandwich$_{animate}$, fish)			*

input such as *the ham sandwich* to refer to a ham sandwich. The preferred or optimal interpretation is determined on the basis of three constraints and their ranking in English. To investigate the role of animacy information in sentence comprehension, de Hoop & Lamers (2006) use a set of five violable constraints. Two of these constraints seem to be relevant to the interpretation of (22). These are Precedence and Selection:

(27) Precedence: The subject precedes the object.

(28) Selection: Fit the selectional restrictions of the verb (animacy).

In English, Precedence is a very strong constraint which in fact results in the ungrammaticality of an object-verb-subject order. In addition, I propose a third constraint, which requires faithfulness between the noun phrase (animate or inanimate) and the individual it refers to (animate or inanimate):

(29) Faithfulness: An (in)animate noun phrase refers to an (in)animate individual.

The constraint in (29) is similar to the faithfulness constraints on the expression of (in)definiteness in Farkas & de Swart (this volume). The outcome of the optimization of the interpretation of (26) can be illustrated in an OT semantic tableau, where the input is the transitive sentence with the two noun phrases in (26) and the optimal output is the winning candidate interpretation. The tableau that illustrates the optimization of the interpretation is given above.

In Tableau 10.1 I have illustrated the conflict between the three constraints in English. The first candidate interpretation is the one in which the noun phrase *the ham sandwich* is used to refer to a (unique) ham sandwich which functions as the subject of the sentence. This candidate violates the selectional criteria of the verb *to eat*, because only animate individuals can actually eat and therefore be the subject of the verb *to eat*. The second candidate interpretation is the one in which the first noun phrase in the sentence, *the ham sandwich*, gets interpreted as the object rather than as the subject, while the second noun phrase, *the fish*, gets interpreted as the subject.

Tableau 10.2 Optimality Theoretic semantic tableau of sentence (30)

Het broodje ham heeft de vis opgegeten	Selection	Faithfulness	Precedence
Eat (ham sandwich, fish)	*		
☞ Eat (fish, ham sandwich)			*
Eat (ham sandwich$_{animate}$, fish)		*	

Hence, the second candidate is the object-initial interpretation, which violates the constraint Precedence, and therefore loses the competition. The third candidate interpretation satisfies both Selection and Precedence, which means that *the ham sandwich* is interpreted as being animate and as the subject of the sentence. This candidate only violates the faithfulness constraint because *the ham sandwich* apparently denotes an animate entity which can eat (that is, it does not refer to a ham sandwich). The third candidate comes out as the winning interpretation. Thus, the optimal interpretation of the given sentence is that either *the ham sandwich* functions as a description or name of a living person, or that we are in a discourse (movie, cartoon) in which ham sandwiches are alive. Anyway, we may say that 'the ham sandwich' is used to talk about a prominent (animate) discourse referent (cf. Dekker (1998)).

Dutch differs from English in that the word order constraint is ranked below the selectional and the faithfulness constraint. As a consequence, the second candidate interpretation wins the competition, as illustrated in Tableau 10.2 above.

(30) Het broodje ham heeft de vis opgegeten.

The word order constraint is weaker than in English but it is still active in Dutch: if the first noun phrase were animate (for instance, *het meisje* 'the girl') then the subject-initial reading would certainly be the optimal one.

As we have just seen, the impact of animacy is sometimes obscured by its interaction with other factors of prominence, in particular word order. Psycholinguists found a strong tendency for a subject-before-object preference, both in language comprehension and production. This tendency is also noted in the typological literature (Greenberg (1963), Tomlin (1986)). In Tomlin's sample, only 4% of the languages have object-before-subject as their basic word order. Languages such as Japanese, which are flexible in that they permit both orders, show the same tendency. Only about 4% of the sentences in the written corpus of Hawkins (1994) has object-before-subject order, while for other corpora of written and spoken Japanese this percentage was even smaller

(Yamashita & Chang (2001)). However, a closer look at the data might reveal that animacy plays an important role here. This is corroborated by Tanaka et al. (2005) who report on two sentence-recall experiments in Japanese for which they found clear 'animate-first' effects. Firstly, speakers are more likely to recall object-before-subject sentences than subject-before-object sentences (but not the other way around) when this allowed an animate entity to appear first. Secondly, they found a tendency to recall sentences in the alternative voice (actives as passives and *vice versa*) when this allowed an animate entity to appear first.

In Fore, a Papuan language, a man is higher in the animacy hierarchy than the pig, and that is why *man* is interpreted as the subject in (31), even though the canonical word order is overruled (Scott (1978), Blake (2001)).

(31) Yagaa wá aegúye.
pig man hit
'The man hit (killed) the pig.'

If the speaker wants to express that the pig hit the man, then the subject needs to be explicitly case-marked as the subject:

(32) Yagaa-wama wá aegúye.
pig-ERG man hit
'The pig hit the man.'

When the two arguments are equal in animacy, word order solely determines what is the subject and what is the object: the first noun phrase will then be interpreted as the subject.

In Mayan languages, basic word order sentences must have animate and definite subjects (England (1991)). In Tz'utujil, the subject has to outrank the object in definiteness, as in (33), and if the subject is equally high or lower than the object in definiteness, as in (34), the sentence becomes ungrammatical (Dayley (1985)).

(33) Xuuch'ey jun iixoq jar aachi.
hit a woman the man
'The man hit a woman.'

(34) *Xuuch'ey jar iixoq jun aachi.
hit the woman a man
*'A man hit the woman.'

The interaction of different factors of prominence, such as animacy, definiteness, and word order, and how this affects grammaticality, clearly deserves further investigation. However, this has to await a future opportunity.

10.5 Conclusions

The main claim of this chapter was that animacy of noun phrases (like definiteness) reflects the prominence of the individuals they refer to. I have defended the view that animacy and definiteness both contribute to the prominence of noun phrases, but they differ considerably in their syntax and semantics. Animacy is just like definiteness an *inherent* property of noun phrases that influences their prominence. Yet animacy is not a linguistic category while definiteness is. Thus, when differential object marking is triggered by definiteness, this might be explained as a function of the syntactic structure of the noun phrase, in such a way that accusative case marking is required for DPs but not for bare nominals which lack a DP projection (Danon (2006)). It is less likely, however, that differential object marking, triggered by the animacy properties of the noun phrase, is the consequence of a difference in noun phrase structure. Other factors, such as word order and grammatical role are *external* triggers of prominence, in the sense that they are determined by the position of the noun phrase in the sentence, its case, or verbal agreement, and not by properties of the noun phrase itself.

Case marking actually seems to behave as a factor somewhere in between, as it clearly involves semantic and syntactic aspects of the noun phrases it is assigned to. When differential object marking is triggered by animacy, the function of the case marking can be either to avoid ambiguity as to what is the subject and the object, or to mark the prominence of the noun phrase in the discourse (de Hoop & Malchukov (forthcoming)). In this sense, animacy resembles definiteness, but is also different, because definiteness clearly is a prominence marker, but usually its function is not to distinguish between the subject and the object. Also, I have pointed out that while accusative case marking can be used to mark only animate objects, crucially it is not used to mark noun phrases *as* animate. In this sense, animacy differs from definiteness as well, since accusative case can actually determine the definiteness of an object in a differential object marking context.

Finally, I have argued that, in general, animate noun phrases start out with a high prominent interpretation which can get overruled by potentially conflicting factors such as grammatical function and word order. By contrast, inanimate noun phrases are interpreted as low prominent, but they can shift to a high(er) prominent reading as well, again due to factors such as case marking, grammatical function, and word order.

Part III
Nominalization

This page intentionally left blank

11

On the role of syntactic locality in morphological processes: the case of (Greek) derived nominals[1]

ARTEMIS ALEXIADOU

11.1 Introduction

A certain amount of consensus exists that the generalization in (1) holds across languages (though expressed from different theoretical viewpoints, see Grimshaw (1990), Bierwisch (1989), Borer (2003b), Borer (to appear), Alexiadou & Grimshaw (2008) among others):[2]

(1) Derived nouns that have argument structure inherit this in some form from their verbal source.[3]

Under a specific understanding of (1), which I follow here, (1) basically says that in order for a noun to have argument structure (AS) this must have been a verb at some point in its derivational history. This suggests a very concrete relationship between morphology and the presence of AS. In particular, it suggests that in languages with verbalizing morphology, nominalizing morphology should appear at the outside of the verbalizing markers and these derived

[1] I would like to thank Hagit Borer, Heidi Harley, Hans Kamp, Florian Schäfer, two anonymous reviewers as well as the participants at the workshop on 'QP structure, nominalizations and the role of DP' in December 2005 in Saarbrücken for their comments. Special thanks go to the editors of this volume whose comments greatly improved the readability of the chapter. The idea to look at the different nominal derivational patterns of Greek grew out of a seminar on nominalizations at the graduate seminar at the University of Crete in May 2005. I would like to thank Elena Anagnostopoulou and the participants for their input and their suggestions. This work was supported by a DFG grant to the project B1: *The formation and interpretation of derived nominals*, as part of the Collaborative Research Centre 732 *Incremental Specification in Context*.

[2] But cf. Ehrich & Rapp (2000).

[3] Note that (1) does not refer to nouns expressing kinship terms and body parts, which are taken to be inalienable possessor constructions. As I argued in Alexiadou (2003), such nouns also license arguments, the inalienable possessor being then an argument of the possessed noun.

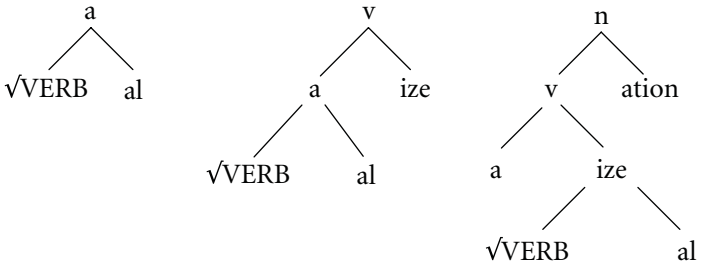
nominals should always (i) bear meanings related to their verbal source and (ii) have AS.

This prediction is even stronger in frameworks that take elements such as nouns and verbs to have no universal significance and to be essentially derivative from more basic morpheme types. As the present chapter adopts such a framework, let me briefly illustrate here how the reasoning works.[4] Recent work in Distributed Morphology (DM) has proposed that elements such as nouns and verbs can be defined as roots which combine with category-determining functional heads as shown in (3); see Halle & Marantz (1993), Marantz (1997), Harley & Noyer (2000b), Embick & Noyer (to appear), Alexiadou (2001), Harley (this volume), and Borer (2005b) for related ideas. On this view, all word formation is syntactic, that is, there is no word formation in the lexicon.[5]

Consider now the example in (2), taken from Borer (2003b). In (2), *-ation* attaches to verbal formations only, that is, to forms that must first become verbs and cannot attach to forms that have not been verbalized. In order for this argument to go through, one must assume that *-ize* functions as verbalizing morphology in English, as suggested by, for example, Embick (2004), Harley (this volume), and others. The morphological structures for (2) are given in (3):

(2) verb, verb-al-ize, verb-al-iz-ation, *verbalation

(3)



The above analysis correctly predicts data such as the ones in (4). Arguably, *verbalization* is derived from the verb *verbalize*, *verb* clearly is not. Hence only the former is expected to license AS.

(4) the verbalization of their concerns took a long time/*was on the table

[4] Since Harley's contribution in this volume offers a summary of the main assumptions in DM, I will not go over that here.

[5] For a different view on nominalizations, see Bierwisch (this volume). For a comparative appreciation of lexical and syntactic approaches to nominalization, see Alexiadou & Grimshaw (2008) and Alexiadou et al. (2007).

Table 11.1. R vs. AS nominals

R(eferential) Nominals	Argument structure (AS) Nominals
non-θ-assigner, No obligatory arguments	θ-assigners, Obligatory arguments
no event reading	event reading
no agent-oriented modifiers	agent-oriented modifiers
subjects are possessives	subjects are arguments
by-phrases are non-arguments	*by*-phrases are arguments
no implicit argument control	implicit argument control
no aspectual modifiers	aspectual modifiers
modifiers like *frequent, constant* only with plural	modifiers like *frequent, constant* appear with singular
may be plural	must be singular

(4) involves an AS nominal, while the noun *verb* is called in the literature referential nominal. The properties of the two classes of nominals are listed in Table 11.1 (based on Grimshaw (1990) and Borer (2003b)).

The above view, however, faces a couple of problems, already noted in Borer (2003b), and the present chapter attempts to deal with them. To begin with, deverbal nominals are ambiguous in several ways (Grimshaw (1990)). The point here is that derived nominals can also have a 'simple' event reading (5a), under which they are like AS nominals in that they have an event interpretation, but with respect to all the other properties in Table 11.1 they pattern like referential nominals. In addition, they can also bear a result reading, under which they refer to a result of a process (and under which of course they behave as referential nominals); see (5b):

(5) a. the examination lasted for hours *simple event*

b. the examination was on the table *result*

But, if the form *examination* always has a verbal source, as the above reasoning suggests, then AS should always be present, irrespective of the interpretation of the noun. See also Ackema & Neeleman (2004) and Harley (this volume) for discussion.

Second, zero-derived nominals in English, Borer and Grimshaw argue, lack AS. The point here is that these nouns look most like verbs, but unlike verbs they can never license arguments. Although in section 11.2 we will see that the strong form of this generalization does not hold, still the distinct behaviour of (6) as opposed to (7) is at first sight puzzling.

(6) the formation/forming of nominals by movement rules (Borer (2003b))

(7) *the form of nominals by movement rules

The above leads us to the formulation of the following question: What is the relationship between form and meaning in connection to AS inheritance? The chapter attempts an answer to this by examining the properties of nominalizations in mainly Greek in comparison to English. The main points that will be made here are: first, in cases where nominal affixes attach outside verbalizing affixes, the result meaning is compositional predicted from the meaning of the verb; second, the presence of AS should be dissociated from the presence of verbalizing morphology. In order to capture data as the ones in (5) above, I propose that the difference between AS and non-AS nominals does not depend on the presence of verbalizing morphology (taken here as a signal of a verbal source). This leads us to a weakening of the generalization in (1), since the presence of a verbal source is not a prerequisite for the licensing of AS.

The chapter is structured as follows. In section 11.2, I briefly summarize the facts on English and Greek nominalizations. In section 11.3, I discuss English nominal derivation in some detail. In section 11.4, I turn to the question of licensing of AS in nominals. In section 11.5, I turn to the issue of the optionality of licensing of AS in the nominal system.

11.2 The form of English and Greek derived nominals

11.2.1 *Some generalizations about English*

Let us first examine the relationship between the form of English nominalizations and their ability to license AS. Here I only concentrate on three processes which create nouns out of verbs: by zero affixation, by affixation with *-ing* (gerund), and by affixation with *-(a)tion*.

In the literature it has been argued that (i) zero-derived nominals have no AS (Grimshaw (1990), Borer (2003b), Alexiadou & Grimshaw (2008)), e.g. **Kim's break of the vase*; (ii) nominal and verbal gerunds always have AS, (see Lebeaux (1986), Grimshaw (1990), and Harley & Noyer (2000b)) e.g. *Kim's breaking of the vase*/*Kim's breaking the vase*;[6] (iii) (*a*)*tion* nominals are frequently ambiguous between AS and R-readings; see (5).

Concerning (i), Smith (1972) discussed verbs of English which display the causative/inchoative alternation, and nominalize without (overt) affixation. Smith points out that these verbs never nominalize as 'transitive' nouns, but only as nouns with a possessive alone, that is, they behave like R-nominals. Examples include *end* and *stop*, which form nominals, but not transitive ones. The generalization is visible in these contrasts: *the race's end*/**the judge's end of the race*; *the train's unscheduled stop*/**the guard's unscheduled stop of the train*.

[6] Apparent counterexamples seem to be lexicalizations: *a good living*, *hand-writing*, etc.

Smith argued that the ability to derive 'transitive' causative nominalizations from 'intransitive' causative verbs is limited to affixes drawn from the Latin vocabulary and is not seen in the Anglo-Saxon vocabulary of English. Thus, *termination* contrasts with *stop*, and *conclusion* with *end*.

Newmeyer (to appear), however, challenges the accuracy of this generalization as to the behaviour of zero-derived nominals, and discusses the following set of examples; see also Harley (this volume):

(8) a. the frequent release of the prisoners by the governor
b. the frequent use of sharp tools by underage children
c. an officer's too frequent discharge of a firearm
d. the ancient Greeks' practice of infanticide
e. my constant need for approval

Still Newmeyer admits that 'perhaps the large majority of AS-Nominals are morphologically complex'. The reasons that lead to this rather messy picture presumably relate to the historical development of the vocabulary of English. For the purposes of this chapter I will assume that the nominals of the type in (8) involve zero morphology. A brief survey of the examples offered by Newmeyer and Harley suggests that the zero nominalizations with AS tend to involve Latinate/French roots.[7] If this is indeed correct, then probably we are dealing with a case of allomorphy in the area of Latinate roots, that is, *-ation* and zero are allomorphs competing for insertion under n. This is not problematic for DM-based approaches, but it is problematic for approaches that deny the existence of zero derivation (Borer (2003b)). I will consider (i), however, as a strong tendency, which still awaits an explanation. Thus, all Romance roots give AS nominals, while this is not the case with all Germanic ones (leaving affixation of *-ing* aside, which applies to both Germanic and Romance roots; see Alexiadou & Grimshaw (2008) for a recent discussion and references). Let us now see how Greek nominals behave.

11.2.2 *Some generalizations about Greek*

One important difference between English and Greek nominal morphology is that Greek nominals have inflectional classes. The result is that bare/root nouns of the type in (8) do not exist in Greek, as all nouns belong to a particular class and take a set of inflections for case in both singular and plural. This is illustrated in (9), where the singular of the non-derived noun 'yard' is

[7] Thanks to Gianina Iordachioaia for checking the origin of these examples.

compared to that of a verb-derived nominal 'destruction'. As can be seen, both take the same set of inflectional affixes:

(9) a. *avli* 'yard' SINGULAR

Nom	avl**i**
Gen	avl**is**
Acc	avl**i**

b. *katastrofi* 'destruction' SINGULAR

Nom	katastrof**i**
Gen	katastrof**is**
Acc	katastrof**i**

The affixes that signal class are of course non-derivational. One could assume that they are generated in some nominal functional projection (NumberP). The reader is referred to Alexiadou & Müller (2008) for further discussion of Greek nominal inflection and references.

There are a number of affixes that can attach to a verbal stem and create a deverbal noun. The most common affixes are: -**m**-, -**sim**-, and -**s**-, illustrated in (10). The picture in (10) is rather complex. First, it is by no means clear how to split stems and affixes in Greek and there exists quite some disagreement among morphologists. Here, following Ralli (1988), I take *-s-* in suffixes such as *-s-i* and *-sim-o* to be part of the suffix and not of the stem. Second, -**m**- and -**sim**- are taken to be allomorphic realizations of the same affix depending on the number of syllables of the stem: -**sim**- attaches to stems with one syllable and -**m**- is the elsewhere form (Malikouti-Drachman & Drachman (1995)).[8] I will refer to these nouns as -**m**- nouns here. As (10d) shows, there are verbs and derived nominals related to 'adjectival' stems:

(10)

	N	V	N
a.	kubi	kub-**on**-o	kubo**m**a
	button (n)	*button* (v)	*buttoning*
	ladi	lad-**on**-o	lado**m**a
	oil (n)	*oil* (v)	*oiling*
	N	V	N
b.	vrasi	vraz-o	vra**sim**o
	boil (n)	*boil* (v)	*boiling*
	plisi	plen-o	pli**sim**o
	wash (n)	*wash* (v)	*washing*

[8] Interestingly, when two forms exist, i.e. one ending in -**m**a and one ending in -**sim**o, they have different meanings: only the -**sim**o ones refer to events, cf. grama 'letter' vs. grapsimo 'writing'.

c.	alifi	alifo	alima		
	ointment	*anoint*	*anointing*		
	vafi	vafo	vapsimo		
	paint (n)	*paint* (v)	*painting*		
d.	A	V	N	N	N
	katharos	kathar-**iz**-o	katharis**m**a	katharis**m**os	kathar**s**-i
	clean	*clean*	*cleaning*	*cleaning*	*catharsis*
	aspros	aspr-**iz**-o	asprism**a**		
	white	*whiten*	*whitening*		

As we can see in (10), more than one nominal form can be related to a particular verb and even traditional grammars observe that when two different nouns relate to a verb, the result is a difference in meaning (e.g. Mirambel (1958)). What we can also see is that certain nominals such as *kubi* and *alifi* do not contain special nominalizing morphology, while the -**m**- nouns and -**s**- nouns do.

Third, there is a class of nominalizations that only shows stem alternation. One could argue here that these nouns contain zero nominalizing morphology, and the stem alternation is a case of Readjustment rules (see Alexiadou (2001)):

(11)

kata-str**e**fo	kata-str**o**fi
destroy	*destruction*
peri-str**e**fo	peri-str**o**fi
revolve	*revolving*

The above pattern is subject to one important restriction. As Kolliakou (1995) observed, -**m**- is sensitive to the aspectual type of the predicate related to the nominal. Prototypical state and telic event predicates do not give grammatical nominalizations when they combine with the affix -*ma/mo*:[9]

(12)

a.	*agapima	agapi	agapo
	loving	*love*	*to love*
b.	*katastrema	katastrofi	katastrefo
	destroying	*destruction*	*to destroy*

[9] Anastasia Giannakidou (p.c.) points out that nominals such as *skotomos* 'killing' and *skotoma* 'kill' exist, contradicting Kolliakou's observation. Though a detailed study of the formations has not been undertaken, these seem to have an idiomatic interpretation.

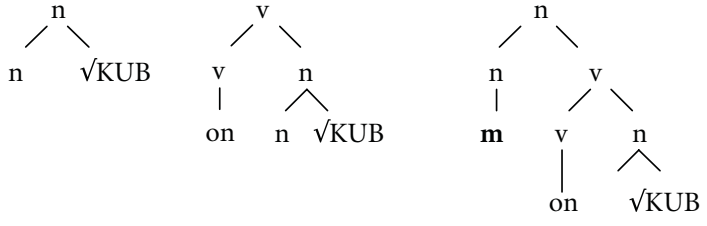
c. *dolofonima dolofonia dolofono
assassinating assassination to assassinate

The question that arises is the following: in cases where one verbal form is linked to two nominal forms, how are the three forms related to one another? In principle, there are two ways to go and in what follows I will sketch both. For my argumentation it is crucial that the nouns which can license AS are necessarily derived from a verbal source. It is for now an open issue whether the non-AS nouns, e.g. *button*, *wash*, *paint*, etc., and their related verbs are root-derived or are found in a derivational relationship to one another.

According to one possible interpretation of these patterns, building crucially on Arad (2003) and references therein, one could suggest that what we see in (10) involves three major patterns of derivation in Greek.[10] Thus, examples of the type in (10a) could be argued to form a first class where a noun is derived from a root and then this noun becomes a verb through the presence of verbalizing morphology, *-iz-*, *-on-*, etc. The verb then turns into a noun through the addition of **-m-** (or **sim-**). This potential path of derivation is illustrated in (13):

(13) a. kubi 'button' kub**on**o 'to button' kubo**m**a 'buttoning'

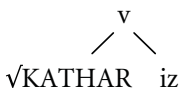
b.



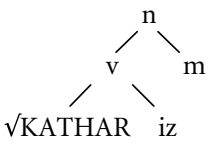
The 'de-adjectival' formations could also be argued to belong in this category, that is, the **-m-** nouns are derived by a verbal stem that contains a special affix (Giannakidou & Merchant (1999), Alexiadou (2001)). The **-s-** noun on the other hand is root-derived:

[10] In all the structures below I abstract away from inflectional endings located in T° for verbs and (presumably) in Number° for nouns, as well as from the presence of D°.

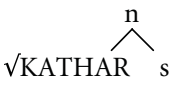
(14)

a. 

katharizo 'clean'

b. 

katharisma 'cleaning'

c. 

'catharsis'

The patterns in (14b) and (13b) show the presence of overt verbalizing morphology. Alexiadou (2001) took *-iz-* and *-on-* to be overt reflexes of v without making any claims on their semantic import. Giannakidou & Merchant (1999) analyse them as causativization affixes which carry the result meaning in them. Crucial for present purposes is the claim that these suffixes instantiate a verbal head which is associated with process/event semantics.[11] In section 11.4, I come back to this.

On the basis of the logic just outlined, the first noun (13a) denotes an entity and the verb refers to some activity that necessarily involves this entity, i.e. buttoning. The **-m-** noun (13c) then denotes the activity expressed by the verb. Arad and Kiparsky take modification via PPs as an argument for this particular order of derivation. We see that this can be applied to Greek as well:[12]

[11] Giannakidou & Merchant (1999) offer a very concrete semantic analysis of the processes of complex event formation in Greek which makes use of structures such as the one in (14a) with certain differences in the notation, illustrated in (i):

(i) $[_{V^\circ}\ A^\circ$ {kathar-} V° {izo}$]$

The authors remain neutral as to whether (i) is derived syntactically via raising of A° to head-adjoin to the verbal suffix in V°, or via a purely morphological rule that derives verbs from adjectives. The claim in this chapter is that we are dealing with a syntactic derivation involving a category neutral root, which denotes a state – as in Giannakidou & Merchant's analysis – and combines with a v head.

[12] Anastasia Giannakidou (p.c.) points out that *kubono* in Greek has a second interpretation meaning 'close' which does not involve a button at all. This is clearly not a meaning derived on the basis of the morpho-syntactic composition outlined here. It is precisely for this reason I believe that several speakers of Greek accept (15b) as grammatical; for these speakers (15b) means something like 'he closed his trousers with the zipper'.

(15) a. *Jim buttoned up his pants with a zipper.

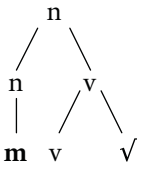
b. ?* O Janis kubose to pandeloni tu me to fermuar.
John buttoned his trousers with the zipper.

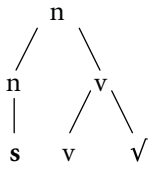
The idea here is that one cannot button without using a button. The question of course is whether we need to make reference to a nominal structure, or whether the contrast in (15) is a result of the instrument/entity interpretation of the root involved.

Turning to the data in (10b), we could see them as forming a second class, where both nouns refer to the meaning of the verb. The -**m**- noun refers to the process expressed by the verb (16c), the non -**m**- noun not necessarily (16d). Both, however, seem to have eventive readings. In many cases, only the -**m**- noun is available (16e–f). The noun denotes an activity.

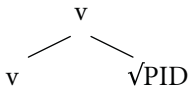
(16) a. plisi *wash* pleno *to wash* plisimo *washing*

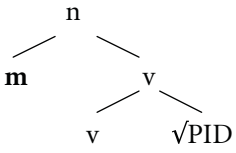
b. 

c. 

d. 

e. pidao *to jump* pidima *a jump*

f. 



Here the issue that arises is whether step (16d) is necessary. In other words, the structure seems to compete with the one in (16c) and it is not clear what decides the choice of the particular vocabulary item. One could imagine that the non-m-noun in (16d) is root-derived, and event interpretation is linked to the special root contained in the structure.

Finally, the examples in (10c) above could be argued to instantiate cases involving root-derived nominals and verbs, while the -**m**- noun is derived from the verb. But, can we really distinguish between (10a) and (10c)? The evidence discussed in Kiparsky and Arad, briefly illustrated above, relates to modification via PPs. As we saw, *button* verbs do not allow PP modification.

Under the analysis of this third category as involving root-derived verbs we would expect modification via PPs to be licit.

In an attempt to generally apply this test to the Greek examples certain complications arise. First, Greek root-derived verbs differ from their English counterparts. In English, verbs like *anchor*, *hammer*, *string*, *house*, *dust*, and *powder* differ from *button* verbs as far as PP modification is concerned in the following manner (see Kiparsky (1982), Arad (2003), and cf. Harley (2005)). As the contrast between (17a) and (17b) shows, modification is possible with *hammer* verbs, as the verb does not mean strike with a hammer. Arad shows that this test can apply to other classes as well, such as the location and locatum verbs (17b–c):

(17) a. He hammered the nail with a rock.
b. She powdered her face with chalk.
c. *She sugared the tea with jam.

If we apply the same logic to the Greek verbs, we obtain the following results:[13]

(18) a. ?*Sfirokopise to karfi me mia petra.
hammered the nail with a stone
'She hammered the nail with a stone.'
b. ?*Pudrarise to prosopo tis me kimolia.
powdered-3sg the face hers with chalk
'She powdered her face with chalk.'

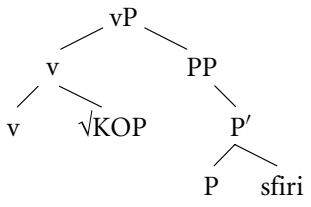
We saw that Greek *button* verbs behave much like their English counterparts. However, Greek *hammer* and Greek *powder* are unlike their English counterparts. Why? In order to answer this question, we have to consider the fact that the Greek counterparts of certain of these verbs are morphologically complex:

(19) a. sfiro-kopo / sfiri
hammer-cut *hammer*
to hammer
b. pudr-ar-o / pudra
to powder *powder* (n)

[13] It should be noted here that speakers do not fully agree on the status of (18a–b). Some share the intuition that (18a) is ungrammatical, since the verb includes the word hammer, and others analyse *powder* in (18b) as simply meaning apply or paint.

In the first case, the verb includes the word *hammer* and a light verb bearing the meaning of *cut/hit*. In the second case, i.e. Greek *powder*, the verb consists of a root, and the affix ar- attached to it. As already mentioned, such affixes are eventive verbalizers. Hence the meaning of the complex is 'apply powder' or 'decorate with powder'. This phenomenon can be subsumed under the broad concept of Manner incorporation (Hale & Keyser (2002a), Harley (2005), and references therein).[14] On this view, the meaning of (18a) is something like *hit with a hammer* and the meaning of (18b) is something like *apply powder*. For this reason, modification by a further PP is odd at least for some native speakers of Greek. (20) below illustrates the structure assumed for (18a):

(20)



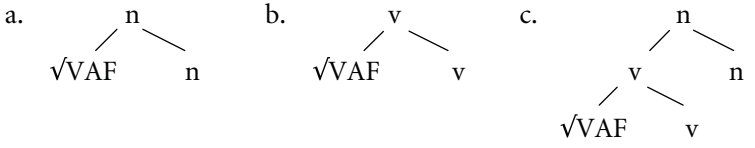
However, the verbs in (10c) behave much like their English counterparts:

(21) a. Alipse to tapsi me vutiro.
anoint the pan with butter
'She buttered the pan.'

b. Evapse to prosopo tu me tin kimolia.
painted the face his with the chalk
'He painted his face with chalk.'

Thus, we could argue that unlike (10a) non -**m**- nouns, (10c) non -**m**- nouns are cases where both the non -**m**- noun and its corresponding verb are derived from a common root; of course the -**m**- noun is derived by the verb:

(22)



This classification gives us three classes. Although I believe that three classes of nominals do exist, it is not clear whether this distinction should be made on the basis of derivational order. A possible and feasible alternative would be to argue that all patterns include roots that become verbs or nouns, depending

[14] The availability of this process is connected to the lack of resultatives in Greek; see Giannakidou & Merchant (1999).

on the first head that categorizes them. The verbal complex can then in turn be nominalized via, in some cases, special affixation, -**m**. The differences we observe concerning interpretation and modification relate to the type of root involved in the structures. Here it is crucial to assume that roots come in different types; see, for example, Levin (2003) (see also the discussion in Harley (2005)). On this alternative view, then, all three classes behave structurally alike, and are identical to what we have in (10c). That is, in all cases, the first noun, the non -**m**- noun, is derived by a root, much like the verb that is related to it. The differences that we get have to do with the category of the root. As can be observed, the three patterns are representatives of three distinct root classes. Specifically, (10a) seems to be representative of the roots denoting entities/instruments and states. (10b) seems to represent the class of the so-called verbs of preparing, while (10c) seems to contain manner roots. Then, whenever an entity/instrument root is included in the structure, we expect that PP modification will be impossible for the simple reason that the root semantics already contains an entity/instrument. On the other hand, if state or manner roots are involved, then modification is possible.

As I have mentioned above, for the purposes of my chapter, the crucial point is that the -**m**- noun is verb-derived, and in principle the non -**m**- nouns in (10) could be root-derived much like the corresponding verb. However, if the remarks in the previous paragraph are on the right track, then this suggests that there is something about the meaning of the roots that plays a crucial role in derivational processes.

Summarizing, one criterion that seems to be valid for Greek is that root-derived nominals lack special nominalizing morphology (*katharsis* here is an exception). On the other hand, all verb-derived nominals do seem to bear special nominalizing morphology,[15] and some of them also contain verbalizing morphology.

Finally, the different types of nominals, i.e. -**m**- and non -**m**- nouns, behave differently when they appear in combination with certain light verbs. Verbs like *throw* are classified as verbs of instantaneous causation of ballistic motion:

(23) a. *Rikse mia plisi sta ruha.
throw a wash to the clothes

b. Rikse ena plisimo sta ruha.
throw a washing to the clothes
lit. 'wash the clothes'

[15] An issue arises concerning those nouns that are 'derived' on the basis of stem alternation. As mentioned above, these could be argued to include zero morphology, and stem alternation is then seen as a case for Readjustment rules.

c. *Rikse mia vafi stin porta.
throw a paint on the door

d. Rikse ena vapsimo stin porta.
throw a painting on the door
lit. 'paint the door'

e. *Rikse mia katharsi sto domatio.
throw a catharsis to the room

f. Rikse ena katharisma sto domatio.
throw a cleaning to the room
lit. 'clean the room'

g. *Rikse mia katastrofi sto hirografo.
throw a destruction to the manuscript

The above examples have the form V-Derived Nominal-PP, where the PP introduces the object which will ultimately get cleaned or painted. This is very similar to the indirect object constructions in Greek involving PPs. On the basis of the analysis in Anagnostopoulou (2003), in combination with ideas expressed in Ramchand (2008) and Marantz (2005), we can take the Greek verb *throw* as being a light verb, instantiating little v, which takes something that is interpreted as a result as its complement. The room/door is the location/possessor of this result. Why a result nominal? According to Levin's analysis of these verbs (Levin (2006)), in these constructions an entity impacts a force on a second entity. In other words *throw a cleaning to the room* is the equivalent of *throw a stone to John*. Hence it is expected that only those nominals that can have result readings will be licensed in this construction and not those that can only bear simple event readings. As we have seen, only -**m**- nouns in (10) show this ambiguity. In further support of this, note the ungrammaticality of (23g), involving a noun that can never have a result reading. Now let us see what the above picture suggests for the licensing of AS.

11.2.3 *Relation between form and AS*

As far as their behaviour with respect to AS is concerned, only the -**m**- forms seem to license AS, the null forms seem not to be able to do so. We clearly do not expect nominals such as *button* which are object nouns to license AS, but nouns such as *wash* and *boil* do not do so either, although they have eventive readings. They behave like referential nominals.

(24) a. to kubi tu paltu
the button the-coat-gen
'the coat's button'
/*To kubi tu paltu kratise 10 lepta.
the button the coat went on for 10 minutes

b. To kuboma tu paltu kratise 10 lepta.
the buttoning the-coat-gen went on for 10 minutes
'The buttoning of the coat went on for 10 minutes.'

(25) a. *I plisi tu aftokinitu kratise dio ores.[16]
the wash the car-gen took two hours

b. To plisimo ton ruhon kratise dio ores.
the washing the-clothes-gen took two hours
'The washing of the clothes went on for two hours.'

c. *I vafi ton malion kratise misi ora.
the paint the hair took half an hour

d. To vapsimo ton malion kratise misi ora.
the painting the hair took half an hour

Similar observations, as far as AS is concerned, hold for 'de-adjectival' formations.[17] Whenever we have two nominal forms related to the same root, only the form that clearly contains verbal layers is able to license AS:

(26) katharis**m**a katharis**m**os kathars**i**

a. {To katharisma/o katharismos tu ktiriu} kratise 5 ores.
the cleaning the cleaning of the building took 5 hours

b. {*I katharsi/tu protagonisti} kratise 3 ores.
the catharsis the leading actor took 3 hours

c. I katharsi itan anapofehti.
the catharsis was unavoidable

[16] Note that examples such as in (i) and (ii) exist:

(i) Tu ekanan plisi egefalu.
him did-3pl wash brain-gen
'They brainwashed him.'

(ii) plisi ruhon 'wash-clothes', vafi malion 'paint hair'

However, the above do not contain nominals licensing AS, but rather they behave like compounds, i.e. the genitive and the head noun form together a complex word. Evidence for this comes from the fact that one cannot replace the genitive in these examples with a referential clitic, e.g. **tu ekanan plisi tu* 'him did wash his', *plisi tus 'wash theirs', *vafi tus 'paint theirs'.

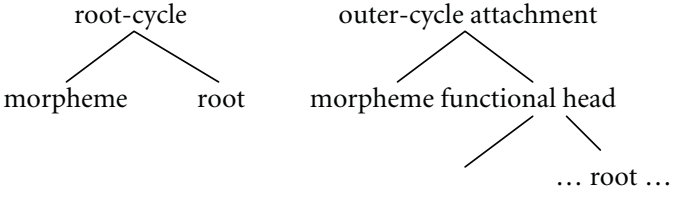
[17] In most cases, the distinction between *-m-a* and *-m-os* is register-triggered, the former being more colloquial than the latter. Apparent lexicalizations exist, e.g. *katharismos prosopu* 'facial cleaning'.

On the basis of the above, we can formulate the following generalization (see Marantz (2001b) for a more general discussion of word formation processes):

(27) **Generalization:**
The morpho-syntactic properties of nouns suggest that when a nominal affix is attached directly to the root we have negotiated (apparently idiosyncratic) meaning of the root in context of the morpheme and absence of AS. In cases where the nominal affix attaches outside verbalizing affixes, the result is compositional meaning predictable from the meaning of the stem.

This seems to hold cross-linguistically, cf. Russian (Engelhardt (1998: 128)), and is further evidence for the existence of two cycles for word formation (Marantz (2001b)):

(28)



We will see below that (27) is the correct generalization only as far as the morphology–meaning correlation is concerned, but not for the AS part.

We could then express the conditions on insertion for the vocabulary items as in (29):

(29) a. Spell-out of n: Root Cycle (not exhaustive)

n ↔ -s /___{√KATHAR/CLEAN/ ETC …}
n ↔ -Ø/___{√VAF/PAINT/ ETC …}

b. Spell-out of n: Outer-cycle, i.e. Root + v (at least)

n ↔ -m- /___{√KATHAR/CLEAN/ ETC …}
n ↔ -s- /___ {√PL/WASH/ ETC …}

As we have seen, what we do find in the Greek data is the following affix-root distribution (cf. Embick's discussion of participial formation in English in Embick (2003)):

(i) The same root can appear with distinct affixes in different cycles.
(ii) Different roots can appear with the same affixes in different cycles.

11.3 Back to English

Leaving aside the issue of English zero-derived nominals for the moment, let us revisit the situation concerning the English nominalization patterns. As stated in section 11.2.1, *-(a)tion* nominals are frequently ambiguous between AS and non AS readings. On the other hand, obligatory licensing of AS is found with verbal gerunds (as in *John's destroying the city*). For these, it is rather uncontroversial that they contain functional layers similar to those of their verbal counterparts. Hence the fact that they license AS does not come as a surprise. In fact, since *-ing* in gerunds is not restricted to a particular type of verb, we could refer to it as the elsewhere form (see Harley & Noyer (2000b)). In Alexiadou (2001) and Alexiadou (2005) I proposed different structures for the two types of English gerunds (verbal vs. nominal as in *John's destroying of the city*) as opposed to *-ation* nominals. Nominal gerunds were viewed as similar to *-ation* nominals, though this is probably a simplification (see Borer (2003b)). Crucially, verbal gerunds differ from *-ation* nominals in that they contain Aspect, and their AS licensing properties are no different from those of their corresponding verbs. They further differ from *-ation* nominals in that these have mixed internal functional projections, nominal and verbal. Specifically, *-ation* nominals like verbal gerunds contain v; they clearly differ from verbal gerunds in that they lack Aspect. It is not clear whether *-ation* nominals contain Voice, but Alexiadou (2001) argued that such nominalizations are actually intransitive, that is, they contain a non-transitive/passive Voice, unlike verbal gerunds. An important difference between *-ation* nominals and verbal gerunds concerned the presence of nominal functional layers in the former and the absence thereof in the latter. Specifically, *-ation* nominals contain Number. Number was taken to be the projections that lead to a nominal internal structure and come together with a set of nominal internal properties, such as the licensing of adjectives and the availability of pluralization:

(30) a. DP [Asp [VoiceP[vP $\sqrt{}$]]] *verbal gerunds*

b. DP [NumberP [VoiceP [vP $\sqrt{}$]]] *nominal gerunds/-ation nominals*

To the extent that an external argument is present in *-ation* nominals and nominals gerunds, this is argued to be a possessor in Spec,DP. The external argument in the case of verbal gerunds, on the other hand, is projected in Spec,VoiceP.

A final note is in order concerning zero-derived nominals.[18] For the purposes of this chapter, to the extent that these nominals license AS, they are derived in a manner similar to *-ation* nominals and the variation in affixation is treated as a matter of allomorphy. In the next section I turn to the issue of ambiguity in the nominal system.

11.4 AS in nominals (or dealing with nominal ambiguity)

As we have already seen, derived nominals are ambiguous. But verbalizing morphology is present in all cases both in English and in Greek.

(31) The verbalization of the concept took a long time. *AS*

(32) The verbalization was long. *simple event*

(33) To katharisma tu ktiriu kratise 5 ores. *AS*
the cleaning of the building took 5 hours

(34) To katharisma mas kurase. *simple event*
the cleaning us tired-made

The morphological analysis clearly suggests the presence of v. Since the roots contained in these nominals do not carry an event implication themselves, this must come from the structure, namely the presence of v. If event implications arise only via the presence of v, this means that all nominal structures that contain v could be interpreted primarily as eventive independently of the licensing of AS. This explains the simple event reading of derived nominals.

What about the result reading of such nouns? At least for Greek, the claim made in Giannakidou & Merchant (1999) is crucial. Giannakidou & Merchant argue in detail that Greek, unlike languages such as English, uses a special set of affixes to form resultatives, and as a consequence lacks pure syntactic means to express secondary predication. This is why in Greek the counterpart of *John hammered the metal flat* is ungrammatical. What is important for our purposes is the idea, mentioned already in previous sections, that affixes such as *-iz-* and *-on-* in Greek have eventive semantics. It is interesting to note that these affixes tend to appear on a special set of roots, namely instrumental/entity and stative ones. In combination with a stative or an entity root, e.g. as in *katharizo* 'clean' and *ladono* 'put oil' respectively, they will bring about a meaning which is similar to that of secondary predication in English, namely a result that is brought about by an event (see Giannakidou & Merchant (1999) for details of the semantic composition). Building on this, we can then suggest

[18] As already mentioned the existence of this pattern is problematic for accounts such as Borer (2003b) which argue against zero derivation.

that this is how the result reading comes about: it is also derived from the same structure. A similar analysis can be conceptualized for the English affixes *-ify-* and *-en-*, and their nominalizations, since the class of verbs containing such affixes do not form secondary predication either; data (35a)–(35b) from Giannakidou & Merchant:

(35) a. *May simplified the assignment easy.

b. *The sunset reddened the clouds scarlet.

These patterns are also discussed in Embick (2004) and the analysis proposed there for participle formation is in a sense similar. A stative root in combination with an eventive affix, FIENT in Embick's terms, can be understood as referring to the result of an action or an event in the nominal domain. In other words, *-ation* nominals are ambiguous between an eventive and a result reading, because they contain such a v layer. Both the simple event and the result reading (as well as the AS reading) have the same basic structure, containing v in combination with the root, thus being in principle ambiguous (contra Alexiadou (2001)).[19] What this suggests is that the availability of the result interpretation will always be dependent on a particular combination of v and the different types of roots. This might explain why certain derived nominals are ambiguous between event and result interpretations, while others are ambiguous between event and object interpretations. The latter contain roots that are not stative, but rather instruments or entities.

In this light, consider again some of the Greek patterns discussed here. A root like √BUTTON simply denotes an entity or an instrument; this root can turn into a verb containing an eventive affix, *-on-*. This structure can become nominal by adding **-m-**. The **-m-** nominal is then ambiguous as predicted between the event and the object reading. The root √CLEAN is stative. It can turn into a verb containing an eventive affix, *-iz-*. This structure can become nominal by adding **-m-**. The **-m-** nominal is then ambiguous as predicted between the event and the result reading.

We have seen, however, cases where the verb does not contain a special eventive affix, e.g. *plisi* 'wash'. Recall that the examples in (10b) are representatives of verbs that belong to the class of verbs of preparing, which includes some transformation of the theme argument. As far as I can tell, in this case the non **-m-** nominals cannot have result/object readings, only purely eventive ones; on the other hand, the **-m-** noun is ambiguous as predicted. Evidence for this comes from the data in (23).

[19] Note that for nouns such as *event* or *trip*, the simple event reading is one that does not arise in the context of v, but is derived from the semantics of the root involved.

Finally, for the examples in (10c), i.e. *vafi* 'paint', where a manner root is involved, the reading of the non -**m**- noun can be a simple event or even an object one, and again, as predicted, only the -**m**- nouns show an ambiguity between an event and a result interpretation. Note that for the examples in (10b) and (10c), if we assume that the non -**m**- noun is root-derived, we must accept that manner roots or roots related to the preparing class are interpreted rather freely under the first nominal head that categorizes them. The meaning we get is related to the main underspecified meaning of the root, but they are not compositional in the sense that the -**m**- nouns are.

The above observations clearly suggest that the structure of AS nouns is not really distinct from that of non-AS nouns: both structures contain a root and an eventive v head. Further supportive evidence that this is the correct generalization (contra Alexiadou (2001) and the generalization in (1)) comes from the following facts, observed by Roßdeutscher (2007). Roßdeutscher makes this point for German, but it can be transferred to the Greek and English data:[20]

(36) i viastiki dianomi
the rapid delivery

(37) the rough estimation/the rough measurement

Roßdeutscher observes that in these cases the adjective 'rapid' and/or 'rough' modifies the event of delivering, estimating and measuring respectively, although the nouns themselves have a result/object interpretation. Assuming that event modification necessarily makes reference to the presence of v, this

[20] Note that this is a problem, first raised by A. Kroch (p.c.), that merits further investigation. In examples such as those in (36)–(37) an adjective seems to be modifying the event denoted by the noun, very much like the interpretation of *Olga is a beautiful dancer* under the *Olga dances beautifully* reading (discussed in Larson 1998). The issue here is that, while we have something with the morphology of an adjective, we have an adverbial interpretation. I suggest that adjectival and adverbial morphology should be separated from the interpretative effects of the modifier. If we assume that the nouns in these examples contain a verbal layer, v, we can explain that the modifier can have access to it. The next question is why the modifier shows up with adjectival morphology. Here I will follow ideas expressed in Borer (1993b) and Alexiadou (2001: 128f.). Borer attributes the ban on adverbial morphology in nominalization to the independent licensing condition that specifies that adverbs are not licensed by lexical projections alone. Alexiadou observes that there is a cross-linguistic correlation between the presence of Aspect and the presence of manner modification. The idea is that the morphology of adverbial (manner) modification requires the presence of Aspect. If Aspect is not present, the modifier surfaces with adjectival morphology, as part of the nominal structure. Note that target state participles offer supportive evidence for this suggestion. Such participles have a structure very similar to that of result nouns, on the view discussed here (see Alexiadou & Anagnostopoulou (2007)). The participles, however, can license adverbs. The reason is that participial morphology is the realization of Aspect, i.e. Aspect is present in the participial structure and hence adverbial morphology is licit.

means that both AS and non-AS nouns, as the nominals in (36) and (37), contain v.

What are the consequences of the above for the licensing of AS? In particular, what accounts for the apparent flexibility of a single root to appear in a variety of AS frames? The general assumption followed here is that AS is associated with structural decomposition. But both AS and non-AS nouns contain v. Note that an approach suggesting that affixes such as *-ation* in English and *-m-* in Greek are underspecified and hence attach at various heights in structure could no longer work. That is, on the basis of the results of the previous sections, it cannot be the case that these affixes can attach both directly to the root and at different (higher) layers of structure (again contra Alexiadou (2001)). Recall one piece of evidence comes from the presences of verbalizing/eventive morphology, and a second piece from the interpretative facts involving adjectival modification.

Hence it seems that we need a distinction between layers that introduce arguments and layers that function as simple verbalizers, i.e. may introduce events but not arguments. What we need to identify is the layers that introduce external arguments and those that introduce internal arguments. In principle, for AS nouns, these layers should be no different from those of the corresponding verbs (in agreement with Alexiadou (2001) and Borer (2003b), Borer (to appear)).

As has been discussed in the literature, the layers that introduce arguments have special properties. VoiceP is responsible for the introduction of external arguments (overt or covert) and the licensing of a particular set of adverbs as well as agentive PPs (Kratzer (1994)).[21] As far as internal arguments are concerned, within DM, different avenues have been explored. Alexiadou (2001), following Marantz (1997), took internal arguments to be introduced by the root, and licensed only under specific structural conditions. But other options have also been proposed. For example, one could argue that v itself introduces internal arguments (Embick (2004), Giannakidou & Merchant (1999)) or other predicates, prepositions, and particles are responsible for internal arguments (see Ramchand (2008) for discussion and references). Independently of the source of the internal argument, crucially, the presence of verbalizing morphology is not related to AS inheritance.

[21] Note that scholars do not agree as to the layer responsible for the introduction of external arguments (see, for example, the discussion in Alexiadou et al. (2006), Merchant (2006), Harley (2007), Ramchand (2008)). Going into the details of this debate would take us too far afield. In this chapter I adopt the analysis in Kratzer (1994) and in Alexiadou et al. (2006), according to which Voice introduces external arguments.

The observations made above concerning external arguments suggest that VoiceP is special, in that it introduces external arguments, while v is not (see Pylkkänen (2002) for arguments from other domains). The structure–morphology correlation in the nominal domain would then be as in (38):

(38)

	root selecting *n*	**v selecting** *n*	**Voice selecting** *n*
AS	NO	NO	YES
Agent PPs	NO	NO	YES
Event reading	NO/depending on the root	YES	YES
Verbalizing morphology between *n* and root	NO	Possible	Possible

Hence the crucial thing for the licensing of external arguments is whether nominalizing morphology attaches on top of VoiceP or lower. Now, is there any evidence for the presence of VoiceP in nominals? In fact, people have argued that Voice (or a similar projection) is indeed present within the nominal domain.

To begin with, gerunds as shown in (30a) are no different from their corresponding verbs in containing Voice, and this is relatively uncontroversial. For *-ation* type nominals, it has been argued (most prominently by Alexiadou (2001), Borer (2003b), Sichel (2007)) that these are 'passive'; see also the discussion of Catalan in Picallo (1991), of Greek in Alexiadou (2001), and of Hebrew in Borer (2003b). Evidence for this comes from the licensing of certain adjuncts related to Voice and/or the passive as well as the licensing of *by*-phrases. First of all, note that, in Greek, verbs that do not form a verbal passive can take an agent PP in the nominalization (this has also been observed for Hebrew). (39c) contains a nominalization of an alternating verb, which receives a passive interpretation when the *by*-phrase is present:

(39) a. to kapsimo tu dasus apo to Jani
the burning the forest by the John

b. to adiasma tu kutiu apo to Jani
the emptying the box by John

c. to alag**ma** ton ruhon (apo to Jani)
the change the clothes-gen by John

There is a strong tendency to interpret nominals which contain the infix **-m-** as 'passive', noted in Alexiadou (2001). Taking the licensing of the agentive PP to

be a reflex of the presence of Voice, the above suggests that Voice is contained in the structure of the nominals (Alexiadou et al. (2006)).

In (40) an example from Hebrew shows that *by*-phrases and implicit control into purpose clauses are licensed by the nominal. The argumentation in Borer (2003b) goes as follows: to the extent that these phrases are licensed within the nominal domain, they are subject to the same conditions as their verbal counterparts:

(40) ha-hoxaxa Sel ha-te'ana ('al yedey ha-matematika'it) kedey
the proof of the claim by the-mathematician in-order
lizkot ba-pras
to-win in-the-prize
'the proof of the claim (by the mathematician) in order to win the prize'

Furthermore, in languages like Greek (Alexiadou (2001)) and Hebrew (Borer (2003b)), we find VoiceP-related adverbs (agent-oriented adverbs) within derived nominals, and the same holds for the English gerund. S-adverbs, on the other hand, are illicit:

(41) axilat Dan et ha-uga be-minus
eating Dan acc the cake politely
'Dan's eating the cake politely'

Assuming that adverbs are licensed by functional layers only, this is also evidence for the presence of Voice in certain nominalizations.

Finally, note that nominals based on roots like *murder* preferably form argument-supporting and passive nominalizations. Such roots need to combine with Voice, due to their 'encyclopedic meaning' (Alexiadou et al. (2006)):[22]

(42) I dolofonia tu Athanasiadi katadikastike apo
the murder the Athanasiadis-gen was condemned by
olus.
everybody

Naturally, (see also Harley (this volume)), non AS examples of such roots also exist (*a murder*). This relates to the general issue of flexibility in AS licensing within nominals to which I turn in section 11.5.

In conclusion, AS nominals contain Voice, which is passive (see also Sichel (2007) for a recent discussion). Turning to the licensing of internal arguments,

[22] For many speakers this also holds for nominals derived from, for example, *destroy* and other necessarily externally caused roots.

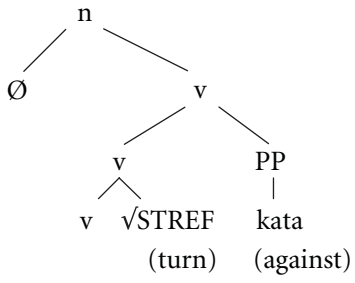
as the presence of Voice only tells us that the structure is interpreted as including an implicit agent, things become less clear. As I have said, in principle one could argue that internal arguments are introduced by the root (for a criticism of this view, see Borer (2003b)). Let me briefly consider some other options here. I begin with the case of the Greek counterpart of *destruction*:

(43) a. kata-stre**f**o katastr**o**fi
destroy *destruction*

b. I katastrofi ton egrafon kratise 3 ores.
the destruction the documents took three hours

Here we have no special nominalizing or verbalizing morphology. We can argue that whenever internal arguments are present, these are licensed by other predicates. Consider the morphological decomposition of the noun:

(44)



Such forms are actually built on the basis of a preposition/adverb and a (manner) root √STREF. The two elements combine very early in the derivation. The overt form is a result of incorporation; see Marantz (2005) for English. Here the presence of an internal argument is related to the lower PP that introduces this argument.

What about the other cases, i.e. the cases such as *katharisma* 'cleaning' and *kuboma* 'buttoning'? Here one can argue that, since these forms contain eventive affixes, these introduce the internal argument, as proposed in Giannakidou & Merchant (1999).[23] In other words, these affixes have exactly the same status as the PPs and the particles in languages like English (see Ramchand (2008) for a more elaborate discussion on the function of resultative phrases).

Let us now turn to *vrasimo* 'boiling' and *plisimo* 'washing'. As already mentioned, these do not seem to contain overt eventive morphology, but still do express eventive meanings, which in the case of *wash* necessarily needs to be brought about by an external causer. In this case, AS is licensed only when

[23] Many thanks to Anastasia Giannakidou for pointing this out to me.

the verbal structure is available, i.e. in the passive structure for *boil* and *wash*. Finally, the nominals such as *vapsimo* 'painting' show an ambiguity between AS and non-AS readings, which again does not seem to be related to the presence of eventive morphology. As with *boil* and *wash*, the availability of result readings in the absence of FIENT morphology is related to the type of roots that participate in a given word-formation process. As for all these a v layer is assumed, one could argue that this level introduces the internal arguments.[24, 25]

11.5 Optionality of AS in the nominal system

The previous sections established the following points: (i) we need to distinguish between verbalizers and layers introducing arguments and (ii) AS nouns and R nouns share the same basic verbal structure, i.e. contain v in addition to the root. This in turn means that derived nominals may have a verbal source, but this is not directly linked to their ability to license AS. This view, however, makes the puzzle concerning the flexibility in the licensing of AS in the nominal environment even more complex. Specifically, if we assume that different types of nouns and verbs share a certain structure, what enforces the presence of a fully fledged AS in the clausal domain and a special type of AS (passive) in the nominal one, which, in addition is often optional?

Note of course that certainly English verbal gerunds are not passive. But these nominals do not differ from their corresponding verbs, apart from the fact that the external argument bears genitive Case, something related to the absence of the nominative Case licenser within the DP, namely Tense. In addition, for verbal gerunds, AS is never optional. Thus, in order to answer the question of optionality, we have to consider those nominals that have both AS and non-AS variants. Building on and extending ideas developed in Alexiadou (2001) and Alexiadou (2005), I would like to propose, though in a sketchy manner, that the optionality of AS in the nominal domain has to do with the presence of NumberP or other layers that constitute a nominal internal structure in combination with a particular (aspectual) type of verbal structure. A nominal internal structure is characterized by the presence of nominal functional projections below D. As verbal gerunds occupy DP positions, they

[24] Alternatively, one could assume that other predicates such as covert PPs are involved (Marantz (2005): on this view *painting of the door* would have structure similar to *painting at the door*), a point which remains open here for further investigation.

[25] A final note is in order here. In all the above cases, -**m**- attaches to a verbal head. But the fact that the reading somehow still makes reference to the root suggests that -**m**- attachment is able to see the root even though other heads intervene between n and the root. Hence what remains to be looked at is the exact nature of the restrictions on the attachment of -**m**-. I leave this for further investigation.

contain a DP layer, where *'s* is located. Hence 'externally' they are DPs. A verbal internal structure is characterized by the presence of verbal layers below D. A mixed internal structure contains both nominal and verbal layers and nominals with that structure show a mixed behaviour. The main claim here is that these nominals that have a mixed internal structure (verbal and nominal) are those that are ambiguous between AS and non-AS readings (Alexiadou (2007a), Iordachioaia & Soare (2007)).

The basic observation in support of this claim relies on the availability of pluralization of AS nominals. In Table 11.1 it is stated that AS nominals are taken to be mass nouns, and thus never pluralize, while R nominals are taken to be count nouns and can pluralize. However, the factual situation is slightly different. A subtype of AS nominals can form plurals, namely telic/bounded nominals can pluralize while preserving their AS.[26] On the other hand, atelic/unbounded AS nominals cannot pluralize, unless they are interpreted as R nominals, in which case they no longer appear with AS. In this respect, only atelic AS nominals are similar to mass nouns.

That the Aspect of AS nominals plays a role in their ability to pluralize has been noted by Mourelatos (1978) and discussed in Borer (2005b) for English, Bierwisch (1989) for German, Markantonatou (1992) for Greek.[27] This is shown below with English examples, taken from Borer (2005b: 78); (45e) was found on the internet:

(45) a. There were three arrivals of a train.
b. There was a capsizing of a boat by Mary.
c. *There was a pushing of the cart by John.
d. There was at least one pushing of the cart to New York by John.
e. He caused three murders of witnesses that was supposed to testify at trial.

As Borer notes, Grimshaw's generalization is correct for atelic AS nominals, which are akin to mass nouns, but not for telic AS nominals, which are akin to

[26] Naturally they can pluralize without AS too, as in (i), where the nominal has the simple event reading:

(i) Man accused of three murders.

I mentioned in the previous section that generally nominals derived from agentive roots preserve their argument structure. Examples such as (i), however, contradict this. But on the view developed here, the behaviour of these nominals is expected: they partake in structures which have a mixed internal structure.

[27] Note that pluralization of derived nominals has been argued to hold in Romanian by Iordachioaia & Soare (2007) and in French and Italian by Roodenburg (2006).

count nouns and thus can pluralize without losing AS. Since the above pattern holds across languages, what we now need to explain is the mass vs. count distinction in connection with atelic-derived nominals, and why introduction of plurality with preservation of AS leads to ungrammaticality only in this case.[28]

Following Sharvy (1978), Borer (2005b) among others, the distinction between mass and count nouns is a structural one. Let us assume that a projection like NumberP or PlP in Heycock & Zamparelli (2005) or ClassP in Borer (2005b) is the projection in which this is realized. In order to approach the issue of AS in connection with the mass vs. count noun distinction, we need to consider the properties plural nominals and mass nouns share. In the literature it has been argued that these share the following two properties: (i) cumulative reference and (ii) homogeneity (see, for example, Krifka (1992)). Let us subsume these under the term unboundedness (Jackendoff (1991)). Let us then propose that the problem of pluralization of AS nominals has to do with unboundedness. In principle there are at least three mechanisms responsible for introducing (un)boundedness in languages (see also Engelhardt (2000)):

(46) a. Pluralization (inflectional feature, introduced via nominal structure)
b. Aktionsart
c. Morphological Aspect

Notions such as Aktionsart and Morphological Aspect relate to aspectual distinctions such as (a)telicity and (im)perfectivity, see Verkuyl (1993), Borer (2005b), Filip (1996), Cappelle & Declerck (2005). All three concepts, unboundedness, imperfectivity, atelicity are related, but presumably separate categories. Crucial for current purposes is the generalization in (47):[29]

(47) count nouns are similar to bounded events
mass nouns are similar to unbounded events

If the function of pluralization is to introduce unboundedness, it can apply to structures that are bounded, i.e. telic AS nominals, and introduce

[28] Note that the fact that telic nominals generally pluralize goes against the hypothesis in Harley (this volume) that pluralization introduces delimitedness, incompatible with an already telic configuration (*the nominalization/*s of two verbs*, where Harley takes the object to measure out the event). Note further that *-ation* nominals are not necessarily telic (Alexiadou (2001) and references therein).

[29] Mourelatos (1978) talks about (im)perfectivity:

(i) perfective events = count quantified
imperfective events = mass quantified

Mourelatos discusses the perfective vs. imperfective opposition known from, for example, Slavic languages and Greek. See Bennett & Partee (1978), Bach (1986), Krifka (1992) for further discussion.

unboundedness. For structures, which are already unbounded via Morphological Aspect, realized in AspP, and/or Aktionsart, realized within VoiceP, pluralization would be nonsensical. The case of unboundedness realized in AspP is presumably the case of English verbal gerunds, for which Alexiadou (2005) argued in detail that they are quite special in the sense that they contain AspectP (imperfective) but lack Number. This explains why gerunds lack several of the nominal properties that characterize other derived nominals, for example, they cannot be modified by adjectives. On the other hand, those derived nouns that contain Number (*-ation* nominals and nominal gerunds) have more nominal properties including the licensing of adjectives and availability of pluralization. The argument here is that, since verbal gerunds lack number, not only can they never pluralize but they can never receive an R-interpretation, as crucially their internal structure is not nominal.

What happens then with atelic AS nominals? As mentioned above, these are marked as unbounded at the VoiceP level. In this case, pluralization is out for the same reason pluralization of a mass noun is anomalous: it is only allowed if the noun is able to be construed as picking out distinct units.[30] In the case of derived nominals, pluralization is possible only under an R-interpretation, that is, when no AS is licensed. As known, there is a difference concerning unboundedness in the verbal domain as opposed to unboundedness in the nominal domain: the former makes reference to VPs and not to, 'lexical' items.[31] Since atelic derived nominals are VPs, which are already unbounded, further introduction of unboundedness via nominal pluralization is out. However, the, 'nominal' part can pluralize, in the absence of AS, since it is not unbounded.

Clearly, further research is necessary in order to determine the exact (semantic and syntactic) role of the projections involved in the interpretation of AS nominals and their participation in bringing about unboundedness.

[30] In syntactic systems such as the ones assumed here, the shift from count to mass is basically reduced to switching on and off the particular projection, i.e. NumberP. It is important to keep in mind that the clash that would arise is a clash negotiated with at the post-syntactic level. That is, I am not appealing to a process of coercion here; I assume that the structure could be formed, but if it contains contradictory information it will be filtered out by the encyclopedia.

[31] See Doetjes (1997) for discussion.

12

Nominalization – lexical and syntactic aspects

MANFRED BIERWISCH

12.1 The issue

The main tenet of the present chapter is the thesis that nominalization – like other cases of derivational morphology – is an essentially lexical phenomenon with well-defined syntactic (and semantic) conditions and consequences.

More specifically, it will be argued that the relation between a verb and the noun derived from it is subject to both systematic and idiosyncratic conditions with respect to lexical as well as syntactic aspects. Familiar cases like (1) and (2) illustrate the point:

(1) a. Daß Eva nach Bern fuhr, überraschte uns.
That Eva drove to Bern surprised us.

b. Evas Fahrt nach Bern überraschte uns.
Eva's drive to Bern surprised us.

(2) a. Daß Peter die Regeln erklärte, war nützlich.
That Peter explained the rules was useful.

b. Peters Erklärung der Regeln war nützlich.
Peter's explanation of the rules was useful.

While the choice of morphological markers is lexically determined and highly idiosyncratic – *fahren/Fahrt (drive/drive)* vs. *erklären/Erklärung (explain/explanation)* –, syntactic combination follows general rules: the verb assigns nominative and accusative case to the subject and direct object; the derived noun systematically requires genitive case for both complements. These observations exhaust neither the idiosyncratic nor the systematic properties of nominalizations, but they highlight the central issue of the present chapter. The relation between lexical entries that enter into verbal and nominal constructions, respectively, can neither be captured in purely syntactic

terms, nor can it be reduced to lexical properties, ignoring the systematic syntactic (and semantic) conditions and consequences. This raises the question how the systematic and idiosyncratic conditions of nominal and verbal constructions are represented, and how they interact.

In what follows, concrete examples of idiosyncratic, lexically determined properties characterizing derivational relations will largely be taken from German, although the type of phenomenon is of course not restricted to a particular language.

12.2 Preparatory remarks

As Alexiadou (2007b) points out, the major controversy between different approaches to nominalization concerns the role of syntactic as opposed to lexical conditions or processes. In other words, different proposals differ with respect to the question whether lexical information is involved in or excluded from the conditions that determine the nominal or verbal character of the constructions in question. This question is intimately related to general assumptions about lexical structure and the organization of grammar.

To begin with, lexical items must be assumed to combine at least phonetic form with conceptual structure. For the time being, it is sufficient to consider both the phonetic form and conceptual structure as arrays of features or primitive elements of some sort. Now, the crucial point is the question, whether lexical items are generally specified for morphological and syntactic properties or consist – as, for example, Borer (2005a) claims – of phonetic and conceptual information exclusively, except for items of functional categories, whose rationale is just the need to provide the relevant syntactic information. If major lexical items are devoid of syntactic information, then nominalization, verbalization, and related processes cannot be lexical phenomena a fortiori, but must be strictly extra-lexical, i.e. essentially syntactic phenomena.[1] However, for reasons that go far beyond problems of nominalization, the inclusion of morpho-syntactic information in lexical items seems to be indispensable. Look for instance at a familiar case of the syntax of German, exemplified in (3) vs. (4), where lexical properties of the synonymous verbs *anfang-* vs. *begin-* (begin) lead to different syntactic consequences in the main clause (a) and the subordinate clause (b):

[1] Notice that the converse exclusion does not hold, that is, nominalization could well be a post-lexical, syntactic phenomenon, even though lexical items provide syntactic information. As a matter of fact, post-lexical phonology such as assimilation across word boundaries is of this type: it is extra-lexical, but does actually presuppose lexical entries providing phonetic information.

(3) a. denn das Konzert fängt spät an
for the concert begins late

b. da das Konzert spät anfängt
as the concert begins late

c. der späte Anfang des Konzerts
the late beginning of the concert

(4) a. denn das Konzert beginnt spät
for the concert begins late

b. da das Konzert spät beginnt
as the concert begins late

c. der späte Beginn des Konzerts
the late beginning of the concert

The point is that verb-movement, which relates (a) to (b), treats *anfang-* as a phrase, applying only to the stem *fang* (or *fängt*, for that matter), thus separating it from the particle *an*, while the verb *begin-* in (4) is moved as a unit, which includes the prefix *be-*. Notice that *anfang-* and *begin-* must be integrated lexical items with practically identical conceptual representation, whose components can in no way be related to the morphological constituents. Their different syntactic behaviour is the consequence of a property that must be lexically marked and cannot be reduced to the conceptual or phonetic information.[2] A different aspect of lexical information shows up in the nominal variant in (3c) and (4c) compared to the cases in (5b) and (6b). Again, *aufhören* and *enden* (end) are conceptually (almost) identical, denoting the counterpart of *anfangen* and *beginnen*. But while both *anfang-* and *begin-* support nominal realizations, this option holds only for *enden*, but is strictly excluded for *aufhören*, as indicated in (6b).[3]

(5) a. Das Konzert endet spät.
The concert ends late.

b. das späte Ende des Konzerts
the late ending of the concert

[2] Although German prefixes like *be-* and particles like *an-* differ systematically with respect to lexical stress, it would be misleading to construe the different behaviour exemplified in (3) vs. (4) as a consequence of a phonetic feature distinguishing *anfang-* and *begin-*, because then syntactic operations would depend on phonological features, which would be just another way to lexically encode syntactic conditions. As a matter of fact, the different stress pattern is a natural consequence of the relevant syntactic property.

[3] It should be noted that (6b) indicates that no nominal realization by whatever morphological marker is available for *aufhör-*. This does not exclude the nominal use of the infinitive, as shown in (i), which is available for every verbal base:

(i) das späte Aufhören des Konzerts

(6) a. Das Konzert hört spät auf.
The concert ends late.

b. *das/die späte Aufhör/Aufhörung des Konzerts[4]

Hence, even if nominalization is not a lexical process but the effect of some functional category which determines the nominal or verbal character of a construction, as supposed, for example, by Borer (2005a) or Alexiadou (Alexiadou (2001), Alexiadou (this volume)), it is clear that lexical items are available for the relevant functional categories only if they are appropriately marked. To this effect *enden* and *aufhören* must exhibit different syntactic information. Yet another type of lexically specified syntactic property is exemplified by (7)–(9):

(7) a. Das Konzert begann später.
The concert began later.

b. Er begann das Konzert später.
He began the concert later.

(8) a. Das Konzert endete später.
The concert ended later.

b. *Er endete das Konzert später.

(9) a. *Das Konzert beendete später.

b. Er beendete das Konzert später.
He ended the concert later.

However the distinction between causative and unergative constructions is to be implemented syntactically, the fact that *beginnen* allows for both of them, whereas *enden* excludes the causative construction and *beenden* the intransitive one, can only be due to their different lexical properties.

Instead of adducing further evidence for the position that lexical entries must indicate specific morpho-syntactic properties alongside phonetic and conceptual information, I will briefly characterize the types of information to be recognized in this respect. The traditional view, first proposed in Chomsky (1965), distinguished at least two types of conditions, namely categorization and sub-categorization. Categorization classifies an expression in terms of morpho-syntactic features, while sub-categorization determines the complements it requires or admits. Sub-categorization turned out to be captured

[4] Note that (6b) indicates the exclusion of *aufhör-* from any nominal realization, irrespective of the morphological marker. It does not exclude, however, the nominal use of the infinitive, shown in (i), which is always available for every verbal base:

(i) das späte Aufhören des Konzerts
the late ending of the concert

more appropriately by what is called *argument structure* or *thematic grid*, specifying the role and properties of optional or obligatory complements of an expression. Hence the general organization of a lexical entry E combines a phonetic form PF(E), specifying the conditions E ultimately imposes on the articulatory and perceptual realization, with a semantic form SF(E), determining the conceptual distinctions contributed by E, and a grammatical form GF(E), which consists of the categorization and the argument structure of E. Schematically:

(10) Phonetic Form $\underbrace{\text{Categorization Argument Structure}}_{\text{Grammatical Form}}$ Semantic Form

Some general remarks must be added about this schema.

First, the overall format of lexical entries is essentially that of linguistic expressions in general, specifying their phonetic, morpho-syntactic, and semantic properties. This follows from the necessity that lexical information contributes to all aspects of linguistic structure, and it corresponds to the fact that different types of linguistic expressions can pick up idiosyncratic features, thereby creating fixed phrases or idioms, which become lexical items just because of their unpredictable properties.

Second, lexical items are based on universal principles of linguistic structure and controlled by conditions and rules of their respective language. This allows them to be underspecified, consisting only of specifications that are not predictable by general rules and principles. Thus, the lexical entries of a language are in fact the place of all and only its idiosyncratic information.[5]

Third, all lexical items consist of each of the four components noted in (10), even if their content is more or less predictable according to general conditions and hence lexically unspecified. Thus, major entries do not only determine their contribution to the phonetic and semantic form but also their categorization and argument structure, even if they appear not to select complements in the narrower sense, like *walk*, *jump*, or *tanz-* (dance), as by default verbs select a subject, and nouns provide a referential *argument position*. More generally, all entries will be assumed to exhibit a categorization together with a pertinent *argument structure*.[6]

Finally, in addition to the major lexical categories such as verb, noun, and adjective, the lexical system is usually assumed to contain functional

[5] See Jackendoff (1997), Jackendoff (2002) for instructive discussion of these points.

[6] This has important consequences for the analysis of nominalizations. Thus, I will not distinguish, as, for example, Grimshaw (1990) and especially Alexiadou (this volume), between nominalizations with AS and referential nominals without AS. Rather I will argue that they differ essentially by making different use of their respective *argument structure*. I will return to these matters in more detail below.

categories like complementizer, determiner, tense, and affixes of derivation and inflection. Although details of these elements and their specific properties are matters of dispute, there is general agreement that they play a crucial role in the combinatorial computation of linguistic expressions.[7] And there is no doubt that functional categories do have characteristic properties of their own in several respects. Thus, they are likely to use systematically restricted repertoires of basic elements of PF and SF, and they can be void of the phonetic or semantic component altogether. This would allow for the 'invisible' elements that merely determine the morpho-syntactic conditions of the elements they combine with and the properties of the resulting combination.

The next section will spell out the components of the overall schema (10) and the dependencies among them in slightly more detail in order to reasonably deal with lexical and syntactic aspects of nominalization.[8]

12.3 Grammatical information of lexical entries

To begin with the interface-level PF, no points beyond standard assumptions about phonetic form need to be made here. In other words, PF(E) should be construed as a redundancy-free array of (presumably binary) phonetic features with little dependency on other components of E.[9] The interpretation of PF-features and their combination belongs essentially to the systems of articulation and auditory perception. Things are far less uncontroversial with respect to the other interface level, namely the content of SF. There is little doubt that the elements and combinations of this structure must be interpreted by (or are drawn from) elements and relations usually called conceptual structure, which is just an abbreviation for the conceptually organized representation of practically all aspects of experience. The wide range of questions raised by this assumption is to be left aside here. It seems to be sufficient to agree on three points.

[7] Functional elements are sometimes assumed to completely determine the non-universal aspects of the computational structure of language, i.e. those morpho-syntactic properties that depend on individual experience and must be learned. Notice that this assumption must not be construed as implying that language-particular information is restricted to functional categories and hence excluded from other elements. Rather it maintains that language-particular morpho-syntactic properties are necessarily determined by functional elements and thus dependent on lexical information, a view that has interesting consequences for theories of acquisition of grammatical knowledge.

[8] The following outline of the structure of lexical items is essentially based on proposals discussed in Bierwisch (1997), Bierwisch (2006).

[9] One type of dependency that might be noted, though, turns on language-particular conditions imposed on PF by certain features of categorization. The different stress in cases like [$_V$ com'pound] vs. [$_N$'compound] is a well known example; the different properties of German particles as opposed to prefixes noted earlier is another case in point.

First, there must be a minimal ontology in terms of which representations are organized. I will assume that two types of conceptual constituents are indispensable: entities – including individuals, substances, events – and situations or states of affairs, in which entities participate. Second, whatever combinations the basic conceptual constituents might enter according to various types of conditions, the resulting conceptual configurations must be systematically structured in one way or another. The most neutral proposal in this respect is to assume combinations that lead to hierarchical dependencies among entities and situations. Third, lexical items, providing building blocks for such configurations, must on the one hand fix certain conceptual conditions as their constant contribution to conceptual configurations, and on the other hand provide variable positions for entities and situations to which these conditions apply. Hence SF must be assumed to consist of constants and variables, which together determine the conditions according to which they combine with other elements. There are various ways to flesh out these three assumptions, but I will leave it at that, filling in further assumptions, if need arises.

Turning next to the components called *grammatical form* in (10), we notice that the *categorization* Cat (E) and *argument structure* AS (E) do not only determine different kinds of properties but are also of rather different formal character. First, Cat (E) is a structured set of binary features which specify the syntactic and morphological classification of E. If E becomes the head of a complex expression E′ by merging with a complement or adjunct Y, then Cat (E) becomes the categorization of E′.[10] In other words, the categorization of a complex expression E′ is that of its head, whether E′ is a lexical item or not. This turns out to play a crucial role in nominalization.

The *argument structure* AS (E) on the other hand is not just a further collection of morpho-syntactic features, but rather a different type of information, which in part uses the same features as Cat, though in a different guise. AS (E), as already noted, consists of argument positions or thematic roles by means of which an item selects its complements. This selection has two aspects, called semantic or *s-selection* and categorial or *c-selection*. Although fairly different

[10] It seems to me that this is after all the rationale underlying Chomsky's proposal (Chomsky (1995)) with respect to the operation *merge,* according to which a complete copy of the head X becomes the label – actually the categorization – of the combination [X, Y], if X merges with a constituent Y, thus generating the configuration [X, [X, Y]]. Intuitively as well as formally, however, the projected property which the head shares with the resulting complex is its categorization, rather than the complete array of phonetic and semantic features (which become part of the resulting combination anyway). In other words, the label a phrase like *eat an apple* inherits from its head *eat* is the categorization of the verb, rather than a duplication of all its phonetic and semantic properties.

views about the nature of thematic roles can be found in the literature,[11] there is general agreement that a thematic role establishes a semantic relation between the lexical item and its complement, and that it is associated with morpho-syntactic conditions the complement in question must meet. Hence two types of information are tied up in an argument position: the semantic aspect, which must be connected in some way to the information provided by SF, and the morpho-syntactic aspect, which refers to the information in terms of which the complement's categorization is specified. Formally, an argument position can be construed as an operator that has access to a variable in SF, thereby determining the relation that the head assigns to the complement in question.[12] On this account, s-selection is determined by the conditions SF imposes on the designated variable, while c-selection is imposed by a set of morpho-syntactic features associated with the operator that constitutes an argument position. Thus, AS (E) is a kind of interface between the semantic and morpho-syntactic conditions combined in E. It identifies semantic variables which are available for further specification by the pertinent complements, and it defines the morpho-syntactic conditions these complements must meet.

The assumptions discussed so far may be illustrated by means of a somewhat simplified entry for the verb *begegnen* (meet, encounter) as given in (11), where the SF-configuration [x MEET y] abbreviates the condition that some entity provided by x encounters an entity provided by y, and [e INST p] indicates that an event e instantiates the condition p, here the condition of x's encounter with y:

(11) / *be - gegn* / [+ V, …] λy λx λe [e INST [x MEET y]]
[Dat]

PF Cat AS SF
GF

[11] See, for example, Reinhart (2002), Jackendoff (2002), and Bierwisch (2006) for different views.

[12] Technically, the operator in question is an abstractor, which can formally be treated as a lambda operator, if the format of SF-representations is built up correspondingly. For details to this effect, see Bierwisch (1997) and related work. For the sake of explicitness, I will rely here on lambda operators to represent argument positions for reasons that will become clear as we proceed. A slightly different proposal has been developed in Jackendoff (1990) and subsequent work. Accordingly, Jackendoff considers an argument position as something like an empty slot within the semantic representation of an expression.

Concerning PF, non-trivial properties of the prefix /be/ in *begegnen* must be captured, but can be left aside in the present context. The feature [+V] in Cat abbreviates the classification of *begegnen* as a verb. As to AS, *begegnen* – like *meet* – is a transitive verb that licenses a subject and an object. They satisfy the positions represented by λx and λy, respectively.[13] Unlike regular transitive verbs, however, *begegnen* assigns dative case to its object, which is indicated by the condition [Dat] attached to λy. The operator λe identifies an argument position that provides the basis for a number of specific properties of verbs, among them the integration of tense and event reference. This rather simplified illustration must be supplemented by a number of comments.

First, features of Cat as well as c-selectional features of AS are drawn from presumably universal options, but according to language-particular conditions. Differing from basic elements of PF and SF, which identify distinctions in extra-linguistic mental domains, morpho-syntactic features represent conditions on mainly language-internal relations and operations. Two types of features with fairly different properties are usually distinguished: syntactic features classify major lexical categories – nouns, verbs, adjectives, etc. –; morphological features introduce specific distinctions within these categories. They are realized according to largely language-particular conditions, leading to inflectional categories like case, gender, number, etc. For the syntactic features, I will provisionally assume, essentially following Wunderlich (1997), that items of major lexical categories are classified by features that primarily distinguish dependent vs. independent referential capacity and strong vs. weak argument positions, as indicated in (12):

(12)

	Noun	Verb	Adjective	Preposition
Dependent	–	–	+	+
Strong AS	–	+	–	+

In other words, adjectives and prepositions are referentially dependent on the items they combine with, while nouns and verbs have independent referential capacity. The common property of verbs and prepositions is the fact that their argument positions are strong, that is, they must be saturated syntactically, unless explicitly indicated otherwise, while those of nouns and adjectives are weak or optional and need not be saturated syntactically, except for the designated or external argument.

[13] For systematic reasons, to which I will return below, the syntactically closer arguments precede the more remote ones in AS. Thus, in (11), λy provides the position of the grammatical object, which in AS precedes the position λx of the grammatical subject.

To illustrate the morphological features realized in German, the following preliminary distinctions for case and gender might be considered without further comment:[14]

(13)

	Nominative	Accusative	Dative	Genitive
Oblique	−	−	+	+
Subordinate	−	+	+	−

(14)

	Masculine	Feminine	Neuter
Feminine	−	+	−
Neuter	−	−	+

It must be added that morphological features, although determining conditions of language-internal computation, may still be related in some way to conceptual distinctions. Thus, tense and number must be connected to time and countability, while case can at best partially be tied to semantic content, although strong efforts have been made to identify semantic content of case features.[15] Conditions for features of syntactic categorization will be taken up below.

The next comment concerns the different aspects of underspecification of lexical items. First, there are conditions that hold within the components of (10), due to which predictable feature values can be left unspecified. This applies to Cat in much the same way as to PF or the conditions fixed in SF: only features or components that do not follow from general rules and principles are lexically specified.[16] Second, underspecification can be due to conditions that hold between different components of a lexical item. Thus, features of c-selection are largely predictable for different argument positions, depending on the categorization of the item. The highest argument of verbs (the subject

[14] There is a large literature about the categories to be assumed and the features by which they are distinguished. This discussion need not be taken up here, though, since for nominalization it is sufficient to assume that morphological features of this sort are available, while particular case or gender features are not at issue. For convenience, I will therefore continue to write [+Dat] for [+Obl,+Sub], [+V] for [−Dep,+Str] etc. whenever feature notation is not decisive.

[15] Hjelmslev (1935) and Jakobson (1936) are paradigmatic examples of this interesting enterprise, the merits and limits of which cannot appropriately be dealt with here. The intricacy of the matter can be seen from the fact that tense is a well-established field of systematic semantic explanation, while case is highly problematic, and gender seems to be something in between: sometimes the male/female contrast clearly corresponds to sex, as in *Bruder* (male, brother) vs. *Schwester* (female, sister), but the majority of cases do not allow for a semantic interpretation at all, as *Löffel* (male, spoon) vs. *Gabel* (female, fork) and lots of other entries demonstrate.

[16] A further step in this direction will emerge if the asymmetry between marked and unmarked values of features is taken into account, such that only marked feature values are lexically specified. As there are intricate issues to be clarified in this respect, I will not deal with these options, although they play, no doubt, a crucial role in nominalization and in derivational and inflectional morphology in general.

position) assigns nominative case in German; the lowest structural argument (the direct object) assigns accusative case; a position in between (the indirect object) would assign dative case. Hence the c-selectional case features in AS are specified only if they are at variance with these general conditions (as noted for *begegnen* in (11)), but not for regular transitive verbs such as *treffen* (meet, encounter, hit).[17] The crucial point here is the systematic dependence of c-selectional conditions in AS on the categorization fixed in Cat. Thus, the same thematic role assigned by a verb to its subject is realized as an adnominal genitive in the corresponding noun, as shown in (1) and (2) above. On this background, the lexical information of *schlaf-* (sleep) could be assumed to automatically provide the c-selection [+Nom] for λx of the verb *schlafen* in (15a), and [+Gen] for the noun *Schlaf* in (15b):[18]

(15) a. / schlaf / [+V, +Strong, . . .] λx λe [e INST [SLEEP x]]

b. / schlaf / [+N, +Masc, . . .] λx λe [e INST [SLEEP x]]

Examples like (15) highlight a particular effect of underspecification: features without lexical specification do not simply save redundant information but are open for different values according to different conditions. Thus, both the subject and the object of a regular transitive verb like *kritisieren* (criticize) can be realized by genitive under nominalization, such that *die Kritik der Studenten* (the critique of the students) is ambiguous, a possibility that is usually blocked for lexically specified conditions on c-selection, such that, for example, the object of *begegnen*, which requires dative, as indicated in (11), cannot become adnominal genitive under nominalization. Hence, *die Begegnung der Studenten* (the meeting of the students) can only mean that the students are the agent of the encounter. This distinction between unspecified, predictable as opposed to lexically marked conditions results in non-trivial consequences for derivationally inherited argument positions.

Another aspect of AS's dependence on Cat has already been noted with regard to the feature [± Strong AS]. As a characteristic effect, the feature [− Strong AS] of nouns and adjectives makes positions in AS optional (with the exception of the highest position). By this condition, complements of verbs

[17] See Bierwisch (1997) and Wunderlich (1997) for further details. It is an important issue of lexical and morphological structure to specify the form and content of the rules and principles from which the dependencies in question would follow. For the time being, I will simply presuppose the rules and principles in question without worrying about details. It should be clear, however, that here universal principles of lexical and syntactic structure must be filled with language-particular conditions on morphological categories and their overt realization.

[18] This illustration is in need of explanation and completion in various respects: [+Strong] is a provisional hint at the inflectional paradigm of *schlafen*; [+Masc] indicates the gender of *Schlaf*. Furthermore, the argument position λx of the noun will automatically be optional, while the corresponding position of the verb is obligatory – a point to which I will return shortly.

and prepositions are automatically obligatory, such that explicit information is required for cases of optionality, as, for example, in so-called pseudo-intransitive verbs: *er liest die ganze Zeit* (he is reading all the time).

As already noted, AS is in some way the intersection of semantic and syntactic information. Hence, besides conditions by which aspects of AS depend on Cat, there are conditions by which AS depends on SF. This applies not only to the 'content' of argument positions but also to the structure of what is sometimes called *thematic grid*, notably its hierarchical organization. There are two views about the origin of this dependency. One considers the hierarchy of positions in AS as determined by their content – agent, theme, recipient, etc. –; the other view derives it from the ranking of variables within the SF-configurations.[19] In any case, the hierarchy in AS is closely related to the content of SF. Lexical specifications in this respect are needed only if the hierarchy of positions in SF deviates from the semantically required ranking – an interesting problem that cannot be pursued here.

It must finally be noted that it cannot be sufficient to construe Cat as a (systematically organized) set of features. The deficit is already obvious in simple cases like *anfangen* vs. *beginnen* (begin), mentioned earlier, more generally in the distinction between prefix vs. particle verbs in German, illustrated in (3) and (4). Verbs like *anfangen* must in fact be represented as lexical items that carry along their specific phrase structure, which differs from that of prefix verbs like *beginnen*, such that verb-movement can apply to the relevant constituent. Hence Cat must be assumed to be integrated with PF, such that Cat labels the item as a whole, but parts of it carry further Cat-features, representing the computation of the syntactic structure:

(16) a. [[$_P$ / an /] [$_V$ / fang /]] [+V]
b. [/ be / [/ ginn /]] [+V]

This is a rather provisional illustration which needs relevant underpinning in order to get the necessary results. It is obvious, though, that, to the extent to which idioms must be treated as lexical items because of their unpredictable properties, elaboration in the direction suggested by (16) is indispensable. For the time being, however, I will stick to the organization of lexical items illustrated in (11).

[19] See, for example, Grimshaw (1990) for the first view, Bierwisch (1997) and Wunderlich (1997) for the second view, both of which are compared in Bierwisch (2006). Although the two perspectives are not incompatible, the assumption that the hierarchy in AS mirrors somehow the organization of SF seems to me correct. As the issue is not decisive in the present context, it might be left open.

12.4 Some examples of German derivational morphology

Before dealing with the systematic aspects of nominalization in German, I will briefly consider a number of accidental but characteristic cases of derivational relations, in order to emphasize the idiosyncratic aspects of derivational morphology, which are not a side-issue that might be ignored if systematic structures are at stake. To slightly overstate the point, irregularity is the rule in derivational morphology. If this is correct, at least two important consequences emerge. First, the computational system as a whole must provide means to represent the conditions of irregularity. Second, the way in which these conditions determine the derivational process producing the effect of systematic and idiosyncratic properties must be made explicit. If we stick to the assumption that the place of idiosyncratic information is the lexicon, these requirements lead to the conclusion that derivational processes are dependent on lexical information, which is the input to computational operations anyway.

The following examples of idiosyncratic relations and partial regularities merely demonstrate the phenomena in question; they do not suggest any systematic presentation of the relevant relations. To begin with an arbitrary example, one might notice a kind of sub-regularity, which has a background in language history, due to which many verbs of the strong inflection class that includes *fallen*[20] do have a lexically fixed event nominal of the sort shown in (15) above. In (17) and (18) a selection of two types of these cases is listed, including 'strong' past tense and past participle:

(17)	a.	schlafen	– schlief	– geschlafen	Schlaf	(sleep)
	b.	fallen	– fiel	– gefallen	Fall	(fall)
	c.	raten	– riet	– geraten	Rat	(advise, advice)
	d.	fangen	– fing	– gefangen	Fang	(catch)
	e.	laufen	– lief	– gelaufen	Lauf	(run, walk)
	f.	rufen	– rief	– gerufen	Ruf	(call, shout)
(18)	a.	beißen	– biß	– gebissen	Biß	(bite)
	b.	reiten	– ritt	– geritten	Ritt	(ride)
	c.	streiten	– stritt	– gestritten	Streit	(quarrel)
	d.	leiden	– litt	– gelitten	Leid	(suffer)
	e.	treiben	– trieb	– getrieben	Trieb	(drive, push)

[20] The ablaut-class in question derives from what is called 'reduplicating' for historical reasons, which need not concern us here.

It must be stressed that these cases are at best semi-regular for various reasons. First of all, the existence of a noun alongside a verb does by no means hold for strong (or irregular) verbs in general, as plenty of cases would easily demonstrate. But even where the correspondence holds, several idiosyncrasies are to be observed. Thus, basic verbs are often polysemous in ways that the event nouns do not share. For instance, *raten* means 'guess, solve (a riddle)' in addition to 'advise', while *Rat* means only 'advice'. The noun *Fall* on the other hand has the additional meaning 'case', which the verb cannot support. The gender of *Leid* is idiosyncratically marked for neuter, while normally the nominals under consideration are masculine. And *Trieb* in (18e) – instead of the expected *Treib* – is semantically isolated from its source, since it means 'instinct' and 'sprout'. Furthermore, the nominal version of the stem is not generally attested even for the class illustrated here: *reiben – rieb – gerieben* (rub) is of the type exemplified in (18), but instead of the expected *der Reib*, the corresponding noun is the regular derivation *die Reibung* (friction). Similarly *schreiben – schrieb – geschrieben* is accompanied by *die Schrift*, which is not the event nominal of the verb.

A notorious type of unpredictability is bound to complex expressions built up by means of particles and prefixes as indicated in (16). The specific properties of these combinations cannot be pursued here. It might only be noticed that German particles and prefixes never determine the categorization of the combination they are part of, differing thereby from derivational suffixes which project their categorization.[21] In what follows, verbs like those in (19) and (20) will simply be considered as complex lexical items, to which nominal counterparts may be attested or missing:

(19)	a.	fallen	(fall)	Fall	(fall, case)
	b.	befallen	(befall, affect)	Befall	(being taken)
	c.	zerfallen	(crumble, disintegrate)	Zerfall	(disintegration)
	d.	verfallen	(decay)	Verfall	(decay)
	e.	entfallen	(fall out)	* Entfall	
	f.	gefallen	(please)	* Gefall	
	g.	überfallen	(attack)	Überfall	(attack)
(20)	a.	abfallen	(fall off, decrease)	Abfall	(rubbish, fall off)
	b.	auffallen	(be conspicous)	* Auffall	
	c.	umfallen	(tumble)	* Umfall	
	d.	wegfallen	(be abolished)	Wegfall	(abolition)

[21] Syntactically, prefixes/particles behave like adjuncts, rather than as complements or heads, but even this is only a provisional characterization.

The syntactic properties of the unseparable prefix in (19) and the separable particle in (20) are those illustrated above with respect to *beginnen* vs. *anfangen*. Besides more or less subtle semantic irregularities, the idiosyncratic stress in (19g) is to be noted: the particle in *überfallen* is unstressed, in line with normal conditions, while the corresponding noun has a stressed prefix *über* – possibly another semi-regularity in view of cases like *übernehmen* (accept, take over) with unstressed *über* vs. *Übernahme* (acceptance) with stressed *über*. Another gap to be mentioned here is the fact that the noun *Unfall* (accident), which combines *fall* with the prefix *un*, systematically lacks the corresponding verb **unfallen*, since *un* can only combine with nouns and adjectives.

A wide range of idiosyncrasies, semi- and sub-regularities, and completely erratic relations show up, if further categories and derivational processes are taken into account. For the sake of illustration, a number of cases are listed here without any further comment:[22]

(21) Buch [N] (book) ⇒ buchen [V] (book) ⇒ Buchung [N](booking)
verbuchen [V] (book, enter)
umbuchen [V] (transfer) ⇒ umbuchbar [A] (transferable)

(22) wenden [V] (turn) ⇒ wendig [A] (nimble) ⇒ Wendigkeit [N] (nimbleness, agility)
verwenden [V] (use) ⇒ Verwendung [N] (use)
⇒ verwendbar [A] (usable)
⇒ Verwendbarkeit [N] (usability)
hinwenden [V] (turn, direct) ⇒ Hinwendung [N] (turn)
abwenden [V] (avert)
⇒ Wende [N] (turn)
⇒ Wendung [N] (turn)

(23) Norm [N] (norm) ⇒ normen [V] (standardize)⇒ Normung [N] (standardization)
⇒ normieren [V] (standardize) ⇒ Normierung [N] (standardization)
⇒ normal [A] ⇒ normalisieren [V] ⇒ Normalisierung [N]
(normal) (normalize) (normalization)
unnormal [A] (anomalous)
⇒ Normalität [N](normality)

[22] The glosses given in (21)–(26) are highly provisional. In many cases, they merely give a hint, as proper correspondences do not exist.

(24) Form [N] (form, shape) ⇒ formen [V] (form) ⇒ Formung [N] (shaping)
umformen [V] (transform) ⇒ Umformung [N] (transformation)
verformen [V] (deform) ⇒ Verformung [N] (deformation)
⇒ formal [A] ⇒ formalisieren [V] ⇒ formalisierbar [A]
(formal) (formalize) (formalizable)
⇒ Formalität [N] (formality)
⇒ Format [N] ⇒ formatieren [V] ⇒ Formatierung [N]
(format) (formatize) (formatization)
⇒ formatierbar [A] (formatizable)
unformatierbar [A]
(unformatizable)

(25) Raum [N] (room, space) ⇒ räumen [V] (remove) ⇒ Räumung [N] (removing)
umräumen [V] (rearrange)
aufräumen [V] (clear away)
wegräumen [V] (clear away)
⇒ räumlich [A] (spatial) ⇒ Räumlichkeit [N] (locality)
verräumlichen [V] (spatialize)

(26) schreiben [V] ⇒ Schrift [N] ⇒ schriftlich [A] ⇒ Schriftlichkeit [N]
(write) (writing) (written) (literacy)
verschreiben [V] ⇒ Verschreibung [N] ⇒ verschriftlichen [V]
(misspell, order) (prescription) (create literacy)
überschreiben [V] (overwrite)
anschreiben [V] (write down) ⇒ Anschreiben [N] (attachment)
⇒ Schreibung [N] (spelling)

These illustrations, which could be multiplied at will, are neither systematic nor complete in any respect whatsoever. I must also refrain from any attempt even to sketch out the semantic (ir)regularities, but I will take up some of the more perspicuous relations below. To conclude this illustration, the derivational steps in a non-trivial case might be indicated in (27), showing the categorial determination of the process by the respective suffixes.

(27) [norm]$_N$ ⇒ [[norm]$_N$ [al]$_A$]$_A$ ⇒ [[norm al]$_A$ [isier]$_V$]$_V$ ⇒
[[[norm al] [isier]]$_V$[ung]$_N$]$_N$
[[[norm al] [isier]]$_V$ [bar]$_A$]$_A$ ⇒
[[[[norm al] isier] bar]$_A$ [keit]$_N$]$_N$

12.5 General properties of derivational morphology

The generalization to be derived from these observations is twofold: on the one hand, derivational morphology establishes well-defined, systematic relations among the expressions involved with respect to their PF, SF, and GF. On the other hand, idiosyncratic conditions and effects can interfere with almost all aspects of these relations. According to more or less standard assumptions, the characteristic properties of derivational morphology are due to affixation, i.e. merging of a derivational affix with an appropriate base, where the affix is the head, which projects its categorization, and the base is its complement, as roughly indicated in (27). Because of their special character, the affixes in question might be assumed to belong to the particular lexical sub-system of functional categories.[23] Two relevant properties of derivational affixes are to be noted. First, the result of merging head and complement belongs to the level of words, a condition which intuitively seems clear and simple, although it is not easily spelled out in formal terms. I will not make any particular efforts in this respect. The second property concerns the behaviour of affixes with respect to the argument structure of their complement. The crucial point here is usually considered as the inheritance of argument positions. Although again the intuitive aspect to this effect appears fairly clear, its technical treatment is controversial. The proposal I want to make here is a rather natural consequence of the basic assumption that discharging an argument position (i.e. assigning a theta role) to an appropriate complement is tantamount to functional application, by which a functor combines with its argument. More technically, if a position λx in the AS of the head H is discharged to a complement C, then λx disappears from the AS of H, while C (or rather its SF) acquires the relation specified for the variable x in the head. The basic notion is illustrated in (28) with the preposition *in* as head and the proper name *Paris* as its object. The SF of *in* indicates that the individual y is located internally to x, and the SF of *Paris* is simply an individual constant that represents the speakers' knowledge about Paris. In order to avoid unnecessary detail, the entry for *Paris* is supposed to have a vacuous argument structure, as it cannot discharge an argument position to any complement. The categorization of *in* in (28a) is projected to the PP *in Paris* (28b), where the SF of *Paris* – the individual constant PARIS – is substituted for the individual variable x, deleting the argument

[23] For the time being, affixes can be considered as entries that meet the standard conditions on lexical items discussed above. No special assumptions need to be made here – except those that will be discussed immediately. Whether and in which way suffixes and other types of affixes are formally different can be left open here. I will simply assume that, in German, derivational heads are suffixes.

position λx from the AS of *in*:[24]

(28) a. / in / [+P] λx λy [y LOC [INTERN x]]
b. / Paris / [+N] [PARIS]
c. / in Paris / [+P] λy [y LOC [INTERN [PARIS]]]

In order to cover the special conditions of derivational morphology, this operation must be extended to include functional composition in addition to functional application. Functional composition combines a functor with an argument that may have unsaturated argument positions, systematically taking over these positions into the set of argument positions of the composite functor.[25] This operation can be illustrated by the German suffix *-bar*, which – very much like its English cognate *-able* – turns transitive verbs like *trinken* (drink), *lenken* (steer, direct), *bemerken* (notice) into the adjectives *trinkbar* (drinkable), *lenkbar* (steerable), *bemerkbar* (noticeable), etc. The suffix *-bar* is a functor, which turns an event type into a disposition or possibility assigned to the verb's direct object. Its lexical information might be as follows:

(29) / *bar* / [+A] λ Y [∃ e [POSSIBLE e : Y x e]]
[+V]

This analysis assumes that *bar* has an argument position λY, which c-selects a verb and saturates both the subject position and the event reference, adding at the same time the condition that the event type specified by the verb is marked as a possibility. Suppose, then, that (29) takes a verb like *trink-* (drink) with the entry (30) as the argument, which it would merge with to form a larger unit. The part of (30) that saturates the variable Y in (29) is marked correspondingly:

(30) / *trink* / [+V] (λ z) $\underbrace{\lambda u\ \lambda e'\ [e'\ \text{INST}\ [\ u\ [\text{DRINK}\ z]}_{Y}\ ]\ ]$

Notice, that λz and λu are the argument positions for the verb's direct object and subject, respectively. Hence they are by default associated with the condition [+Acc] and [+Nom]. As this is fully regular information, it is not lexically specified. The object position λz, however, is marked as optional, in view of the

[24] Formally, the operation question is just the semantic effect of the operation *merge*, by which two constituents X and Y form a new expression X′. The semantic effect is tantamount to the standard form of functional application; technically it follows exactly the conditions of *lambda-conversion*. For further motivation and technical details see, for example, Bierwisch (1997), Bierwisch (2006), or Wunderlich (1997).

[25] Functional composition is actually the more general operation, as it includes functional application as the special case where the argument to which the functor applies does not have unsaturated argument positions. For further discussion of technical details see Bierwisch (1989) and the references given there.

'pseudo-intransitive' character of *trinken*, which may be used without a direct object. Now, the functional composition of (29) with (30) as its argument yields (31), which, by strictly formal variable substitution, leads to the resulting expression (32):

(31) / *trink-bar* / [+A] λ z [∃ e [POSS e : $\underbrace{\lambda u\, \lambda e'\, [e'\ \text{INST}[u\, [\text{DRINK z}]\,]}_{Y}$] x e]]

(32) / *trink-bar* / [+A] λ z [∃ e [POSS e : [e INST [x [DRINK z]]] x e]]

Notice, in particular, that the argument position λz, which started out as the object position *trinken* in (30), is preserved in (32), where it has automatically been turned into the designated position of the adjective.[26] In other words, the resulting adjective inherits an argument position from the base of the derivation and turns it into the designated argument of the derived expression. Which arguments are inherited and which derived position they eventually occupy depends, as we will see, completely on the derivational affix, just like the resulting categorization, although in rather different ways.

This leads to a third factor to be noted about derivation: the categorization projected from the affixal head determines the category-specific properties of the derived AS, including the predictable conditions on c-selection. Thus, the only position in the AS of *trinkbar*, which is inherited from the verb, where it used to be the position of the optional direct object, is now obligatory and cannot be associated with [+Acc] for c-selection. This is a general consequence of the categorization by [+A], indicating that [+Acc] cannot be lexically fixed, like the [+Dat] in, for example, *helfen* (help), which does not allow for the adjectivization **helfbar*.

To summarize the general properties discussed so far, the following conditions have been identified:

(33) Derivational morphology is essentially determined by lexical properties of derivational affixes. Derivational affixes are lexical items which

a. are heads that project their categorization to the resulting combination;

b. combine with their base by functional composition, thereby possibly inheriting argument positions from their base;

c. determine the predictable properties of the resulting AS.

[26] This creates the passive-like effect, which is visible in the close paraphrase

(i) Der Wein ist trinkbar.
The wine is drinkable.

(ii) Der Wein kann getrunken werden.
The wine can be drunk.

These conditions are not arbitrary, isolated stipulations. They belong rather to the independently motivated assumptions about the structural and computational properties of language, notably the organization and role of lexical items. More specifically, (33a) and (33c) must be assumed independently of the considerations about derivational morphology. Thus, only the condition (b) about functional composition looks like a special stipulation. This might well be correct if derivational morphology does in fact have special properties. If, however, functional composition is recognized as a natural – in fact the more general – option for computational processes (see fn. 24) once an appropriate framework for argument positions is established, then derivational morphology would cease to need particular stipulations. The effect of functional composition would be determined rather by the specific argument positions of derivational operators, and the c-selection assigned to them.

It remains to be shown, however, how the conditions in (33) may allow and account for the wide range of idiosyncratic phenomena that have been demonstrated to be characteristic for derivational processes.

12.6 Some aspects of nominalization in German

Before dealing with two types of idiosyncrasy more systematically, I will illustrate the typical cases of nominalization in somewhat more detail. As already noted, de-verbal nouns can be created in German by means of a number of suffixes with similar, but not completely identical properties. The choice between them will be dealt with in the next section. Here I will briefly discuss derivations by means of *-ung*, which is in a sense the neutral, unmarked, or default case of event nominalization, which does not mean, however, that it is always (or even normally) available. (34)–(36) exemplify the regular case, (37) and (38) illustrate the gaps one must be prepared for: *suchen* does not nominalize by means of *-ung*, *finden* does not nominalize at all.

(34) a. Hannibals Belagerung der Stadt
Hannibal's siege of the city

b. Hannibal belagerte die Stadt.
Hannibal besieged the city.

(35) a. mehrere Besichtigungen der Burg
several visits of the castle

b. Die Burg wurde mehrfach besichtigt.
The castle was visited several times.

(36) a. Peters Begegnung (mit seinem Freund)
Peter's meeting (with his friend)

b. Peter begegnete seinem Freund.
Peter met his friend.

(37) a. Karls Suche/*Suchung (nach dem Weg)
Karl's search of the path

b. Karl suchte den Weg.
Karl was searching the path.

(38) a. *Karls Findung/Fund der Kinder
Karl's finding the kids

b. Karl hat die Kinder gefunden.
Karl found the kids.

The basic and fairly simple information for the entry *-ung* is given in (39): Cat turns the resulting combination into a noun with feminine gender. The argument position λY c-selects the SF of a verb, inheriting its argument positions, which, by general conditions, become optional and can only c-select the genitive.[27]

(39) / *-ung* / [+N, +Fem] λY [Y]
[+V]

Merging (39) with the stem of a verb like *berechnen* (compute, calculate), whose entry would be something like (40), yields (41):

(40) / *be-rechn* / [+V, . . .] λx λy λe [e INST [y CALCULATE x]]

(41) / *be-rechn-ung* / [+N, +Fem] λx λy λe [e INST [y CALCULATE x]]

If one compares (40) and (41), the addition of *-ung* and the change from [+V] to [+N,+Fem] appears to be the only difference. However, while the AS in (40) has obligatory positions which c-select accusative and nominative, the corresponding positions in (41) are optional – except for the highest position λe, which is the obligatory, referential position of nouns. Notice that as a consequence of *-ung*, the event reference of the verb automatically becomes the referential position of the derived noun.

The next point to be noted is the possibility to derive event nouns not only from verbs, where event reference is already built in, but also from adjectives

[27] It must be noted that adnominal genitive of anaphoric pronouns in German is regularly realized by the corresponding possessive pronoun. Thus, instead of **seiner Beschreibung des Unfalls* (∼ of his description of the accident) we get *seine Beschreibung des Unfalls* (his description of the accident), alongside *Bélas Beschreibung des Unfalls* (Béla's description of the accident).

like *gesund* (sane), *krank* (sick), *wahr* (true), *dumm* (stupid), etc., which specify a property of different types of individuals. The suffix that derives the corresponding event (or rather state) nominals is *-heit*, producing *Gesundheit* (sanity), *Krankheit* (sickness), *Wahrheit* (truth), *Dummheit* (stupidity), etc. Here the event reference is not provided by the adjective but must be introduced by the suffix, as the resulting noun refers to the situation in which the predicate expressed by the adjective holds for the optional complement, such that *seine Krankheit* could be paraphrased as 'his being sick'.[28] (42a) is an entry for *-heit* which accounts for these properties. After combining it with an adjective like *gesund*, as represented in (42b), we get the noun in (42c):

(42) a. / *-heit* / [+N, +Fem] λ Y λe [e INST Y]
[+A]
b. / *gesund* / [+A] λx [SANE x]
c. / *gesund-heit* / [+N, +Fem] λx λe [e INST [SANE x]]

The two argument positions of the derived noun have different origins. The position λx is inherited from the adjective; λe is added by the suffix. Both are controlled by the general conditions on AS of nouns, due to which λe is the obligatory position, on which the noun's reference to appropriate individuals – states of affairs in the case at hand – is based, and λx picks up the feature [+Gen], thereby c-selecting an optional complement. Notice that this is the standard AS for relational nouns, as shown by the parallel properties of *Pauls Freund* (Paul's friend), *Pauls Gesundheit* (Paul's sanity) but also *Pauls Beschreibung* (Paul's description).

As noted earlier, derivational operations can apply repeatedly. Thus, *berechnen* as a transitive verb might be the basis for a derivation with *-bar,* to build up the adjective *berechenbar* (computable), from which in turn the noun *Berechenbarkeit* (computability) can be derived by the suffix *-keit*, which is identical with *-heit*, except for the PF-difference *h* vs. *k* in PF:[29]

[28] In a way, *-heit* adds the instantiation of a proposition by a situation, similar to the copula *sein* (be), which turns an adjective like *gesund* into the verb *gesund sein*. (i) is a simplified representation of the copula, which yields the VP in (ii). See Bierwisch (1997) and Maienborn (2002) for further discussion.

(i) / *sei* / [+V] λY λx λe [e INST [Y x]]

(ii) / *gesund sei* / [+V] λx λe [e INST [SANE x]]
[+A]

The crucial difference between (i) and the suffix *-heit* is the different categorization.

[29] The choice between *-heit* and *-keit* belongs to the idiosyncratic phenomena considered in the next section. What is peculiar here is not only the very limited phonetic difference between the competing suffixes but also the fact that a mixture of phonetic and lexical conditions determines the choice. The details of this particular aspect must be left aside here.

(43) a. / *-keit* / [+N, +Fem] λ Y λe″ [e″ INST Y]
[+A]

b. / *be-rechen-bar* / [+A] λ z [∃ e [POSS e : [e INST [x CALCULATE z]]]]

c. / *be-rechen-bar-keit* / [+N, +Fem]
λ z λe″ [e″ INST [∃ e [POSS e : [e INST [x CALCULATE z]]]]]

The result (43c) might look unnecessarily clumsy with its double instantiation of states of affairs, distinguished here as *e* and *e″*. Notice, however, first, that the representation is derived in fully regular steps, such that both instantiations are independently motivated. And, second, there are in fact two layers of instantiation involved in nominalizations like *die Berechenbarkeit des Stroms* (the calculability of current): the possible instantiation of calculation, and the reference to the situation in which this possibility holds.

Another regular option for de-verbal nouns is agent nominalization like *Arbeiter* (worker), *Sucher* (searcher), etc. The suffix *-er,* on which this operation rests, turns the verb's subject position into the referential position of the noun. Besides the relevant changes in AS (absorption of the referential and inheritance of the other positions), the suffix *-er* adds to SF the condition that the activity specified by the verb is construed as a habitual, rather than an actual property of the agent: *Der Fahrer wartet* (The driver is waiting) refers preferably to a person with the disposition to drive, not to one actually driving. These considerations lead to the entry (44a), which composes with *lenken* (steer, direct) in (44b), to derive the noun *Lenker* (44c).

(44) a. / *-er* / [+ N, + Masc] λ Y [DISPOSITION [Y e]]
[+V]

b. / *lenk* / [+V] λ z $\underbrace{\lambda u\ \lambda e\ [e\ \text{INST}\ [\ u\ [\text{DIRECT}z]}_{Y}\ ]\ ]$

c. / *lenk-er* / [+N, +Masc] λ z λ u [DISPOSITION [e INST [u [DIRECT z]]]]

This rather provisional analysis of agent nominalization illustrates another phenomenon that shows up in derivational morphology, but not only there. The natural interpretation of *der Lenker des Wagens* may be the driver of the car, but is more likely the car's steering wheel. As is well known, agent nominals may refer either to an (habitual) actor or to an instrument. Whether this is to be treated as a systematic ambiguity or an idiosyncratic property of the derived noun is by no means obvious. It must be added at this point that similar phenomena show up with event nominalizations. *Die Lenkung*

des Wagens, for example, may refer to the situation of steering the car, but more likely to the relevant means for steering it, very much like *der Lenker des Wagens*. I will return to these intricate matters in section 12.8.

12.7 Affix selection

The most robust aspect of idiosyncratic variation in derivational morphology concerns the choice of affix. (45) is a sample of possibilities for event nominalization:

(45)	a.	spring-en (jump)	– Sprung-ø [+ Ablaut]	[+Masc]
	b.	fall-en (fall)	– Fall-ø	[+Masc]
	c.	spiel-en (play)	– Spiel-ø	[+Neut]
	d.	glaub-en (believe)	– Glaub-e	[+Masc]
	e.	such-en (search)	– Such-e	[+Fem]
	f.	fahr-en (drive, ride)	– Fahr-t	[+Fem]
	g.	mein-en (mean)	– Mein-ung	[+Fem]
	h.	ab-sorb-ier-en (absorb)	– Ab-sorp-tion	[+Fem]
	i.	konsultier-en (consult)	– Konsult-at-ion	[+Fem]
	j.	blam-ier-en (discredit)	– Blam-age	[+Fem]
	k.	denk-en (think)	– Ø	

This list is neither systematic nor complete, but it indicates the range of idiosyncrasy with respect to phonological shape as well as to conditions of interpretation. One might also wonder whether cases of 'zero-derivation' like (a), (b), and (c) must be considered as the result of derivation or simply as lexical items, and whether and where a proper boundary between derivation and inflection is to be drawn. Moreover, cases like (45k) indicate that idiosyncratic conditions do not only determine the choice of an affix but may also exclude nominalization altogether.

Furthermore, various types of sub-regularities are to be noted. As shown in (45) for cases like *Fall*, *Lauf*, *Ruf*, etc., classes of ablaut-verbs might play a role, while other cases, such as *Konsultation* (consultation), *Destruktion* (destruction), etc., are bound to non-native items. Central types of derivation are finally to be distinguished from marginal ones, with *-ung* as in (45g) at one end and *-age* as in (45j) at the other end of the scale.

The main problem emerging from these observations is the question where and how idiosyncratic conditions, including sub-, semi-, and irregularities, are to be specified. An obvious fact in this respect concerns the dependencies

in cases like (45), which are clearly bound to the base of the derivation, i.e. to the stem on which the nominalization is based. It seems to be evident that a verb like *stören* (disturb) determines the choice of *-ung* in *Störung*, but not the suffix *-ung*, the choice of the stem *stör-*. The most robust support for this view comes from the quantitative asymmetry between stems and affixes: the determination relates a highly restricted set of suffixes to a large number of stems. Hence it seems natural to suppose that, for example, *fahren* (drive) selects the suffix *-t*, while *stören* (disturb) selects *-ung*, leading to *Fahrt* (drive) and *Störung* (disturbance) respectively.

This would be at variance, however, with the general and uncontroversial notion that the affix is the head, which projects its categorization and selects the stem as its complement. In other words, the complement would select the head if the determination of the suffix by the stem were indeed a matter of c-selection. This apparent paradox disappears, however, if the choice of the affix is construed as the effect of a specific feature which belongs to the categorization of the stem and matches with a corresponding feature included in the c-selectional conditions of the affix. For the sake of illustration, suppose a feature [+F] be included in Cat of every stem that can be nominalized by means of *-ung*, and [+F] is also introduced into the c-selectional condition of *-ung*, such that the entry (39) for *-ung* is changed to (46), with a corresponding extension of Cat in verbs like *lenken*, *berechnen*, etc. as illustrated in (47). It is easily verified that the combination of (46) and (47) gives *Berechnung* as before, repeated here as (48), except that the verb now meets the c-selection of *-ung* specifically with respect to the feature [+F].

(46) / *-ung* / [+N, +Fem] λY [Y]
[+V,+F]

(47) / *be-rechn* / [+V, +F . . .] λx λy λe [e INST [y CALCULATE x]]

(48) / *be-rechn-ung* / [+N, +Fem] λx λy λe [e INST [y CALCULATE x]]

This assumption only makes sense, of course, if corresponding features are selected by other suffixes, as illustrated in (49)–(51):

(49) / *-t* / [+N, +Fem] λY [Y]
[+V,+F′]

(50) / *fahr* / [+V, +F′ . . .] λy λe [e INST [TRAVEL x]][30]

(51) / *fahr-t* / [+N, +Fem] λx λe [e INST [TRAVEL x]]

[30] I am ignoring here the fact that *fahren*, like *drive*, has a causative and intransitive reading, with the event noun *Fahrt* being restricted to the intransitive variant: *seine Fahrt* can only mean 'the event of his travel', hence, **seine Fahrt des Wagens* is ungrammatical.

Notice that the feature [+F] in (47), like [+F′] in (50), belongs to the categorization of the verb; it contributes to its classification (as a verb that nominalizes with *-ung*), but it does not c-select the suffix. In (46) and (49), on the other hand, [+F] and [+F′] are part of the c-selection of the affix, such that now the head selects the stem, as desired, although the stem is categorized by the feature that expresses the relevant condition.

It must be stressed that the feature [+F] is not just a notational trick, introduced in order to preserve the formal requirement that the head selects the complement under the peculiar conditions of derivational morphology. Rather, [+F] and [+F′] illustrate a specific type of feature with well-motivated properties, which can only be hinted at here. The central role of the features in question is to relate stems to potential derivational affixes. They indicate, so to speak, the address of derivational elements. In this sense, they reflect the structure of a specific lexical sub-system. The difference between central and marginal types of suffixation is directly manifest in the features under discussion. It provides a natural basis for the distinction between more and less complex or costly features: [+F] addressing *-ung* is less complex than [+F′], the address of *-t*. Finally, what has been discussed with respect to event nominalization holds in much the same way for other cases of derivation: German de-verbal adjectives like *zöger-lich* (reluctant), *wend-ig* (versatile, agile), *folg-sam* (obedient) are an obvious case in point.

The type of feature discussed in this section is a natural and in fact indispensable means to account for one particular aspect of idiosyncratic phenomena in derivational morphology. This includes unpredictable peculiarities as well as sub-regularities, which will be reflected by systematic properties of the feature system to which [+F] and [+F′] belong.[31] For further discussion of this proposal see Bierwisch (1989). With respect to the main tenet of the present chapter, it is an interesting observation, that – if these considerations are on the right track – derivational processes are controlled not only by particular features of individual lexical items but in a sense by the organization of the lexical system as a whole.

12.8 Conceptual shift and related phenomena

Presumably the most extensive and most intricate domain of idiosyncratic properties affecting the result of derivational processes is the conceptual

[31] It is an open, and in fact intriguing question which sub-regularities are to be captured in which way. The morphological categorization of verbs with respect to inflectional classes is a possibility already mentioned. Another type of condition might be related to the observation that verbs with accusative object opt for *ung*-nominalization, hence they are marked [+F] by default. These are rather preliminary hints, however.

interpretation and the grammatical conditions related to it. Leaving aside totally erratic cases like *Zeitung* (newspaper), *Achtung* (respect), or *Richtung* (direction), which look like nominalizations, but cannot be traced to any reasonable derivational basis, or cases like *Anstand* (manners), whose interpretation is based on complete lexical isolation, there is still a lot of unpredictable variation and fixation even for obvious instances of regular derivation. Ubiquitous cases like *Aussicht* (view), *Umstand* (circumstance) illustrate the phenomena, which are of course not exactly chaotic but still not due to systematic and general conditions of linguistic computation. I do not have to say here anything about idiosyncratic cases of this sort, and will restrict the subsequent discussion to phenomena that have been considered as systematically related to nominalization.

According to observations discussed in Grimshaw (1990), taken up in slightly modified form in Alexiadou (this volume), a three-way distinction of de-verbal nouns like *construction* seems to be indicated:

(52) a. event nominals with regular derived argument structure
b. 'simple' event nouns without argument structure (allowing only adjuncts)
c. result nouns

The main difference between the cases in (52a) as opposed to those in (b) and (c) is that they do not only inherit the complete AS of the verb but also prevent plural formation, while the cases in (b) and (c) do not inherit argument positions but admit plural formation. The difference between the cases in (a) and (b) as opposed to those in (c) is that complete as well as simple event nominals refer to events or states, while the cases in (c) refer to the result of the event (often, but not necessarily an object). Thus, (a) differs from (b)/(c) primarily due to grammatical conditions, while (c) differs from (a)/(b) due to semantic conditions. Both distinctions have further consequences (or presuppositions).[32]

(52) is, of course, not a complete list of differences in de-verbal nominalizations nor does it seem to be correct with respect to the distinguishing properties – at least not in German. I will in fact argue that the classification is dubious and rests on problematic premises. To begin with, the claim about plural formation fails, as the following cases show:

[32] Alexiadou (this volume) lists nine properties by which R(eferential) nominals differ from AS nominals, noting, however, that the distinctions in question have repeatedly been challenged and that they are not sharp or clear-cut but allow for various sorts of intermediate and borderline cases. The following discussion casts doubt on the distinction from a somewhat different perspective than the one pursued by Alexiadou.

(53) a. Unsere Erkundungen der Insel dauerten jeweils bis zum nächsten Morgen.
Our explorations of the island went on always to the next morning.

b. Pauls Fahrten in die Schweiz waren immer erfolgreich.
Paul's trips to Switzerland were always successful.

c. Drei Untersuchungen der neuen Patienten dauern noch an.
Three examinations of the new patients are continuing.

d. Die Umzüge fanden meist pünktlich statt.
Mostly, the removals took place in time.

e. ??Die Bebauungen sind verlassen.
The buildings are abandoned.

Obviously, (53a–c) must be considered as complex event nominals, referring to repeated events, and they are well formed in spite of the pluralized nominals. Things are less clear with (53d) and (53e). Looking first at (53e), the result interpretation of the noun derived from *bebauen* (cover with buildings) is not only possible and natural but in fact cogent in view of the predicate *verlassen* (leave, abandon). The pluralization of *Bebauung* is nevertheless dubious, and in any case less natural than the plural of *Fahrt* for example. A different problem is related to (53d), where according to the conditions related to (52) the plural would be allowed, since *Umzüge* (removals) is a simple noun without complements. However, it could naturally be expanded into *die häufigen Umzüge der Studenten* (the students' frequent removals), where either the students cannot be the agent of *umziehen*, or *Umzug* ceases to be a simple event noun. In any case, the claim that pluralization is excluded for event nominals with argument structure seems to be unwarranted.

The comment on (53d) indicates another problem of the classification (52). There is no formal, 'visible' difference between complex, simple, and result nominalizations, hence the distinction between simple and complex nominals rests on the appearance of complements realizing argument positions. If, however, argument positions of nouns are generally optional, as must be assumed for independent reasons, the distinction between the absence of a position in AS and an unrealized optional complement becomes spurious, and the distinction between simple and complex event nouns collapses.

With respect to semantic differences between event and result nominals, the question arises whether nominalizing suffixes, or at least some of them, must be analysed as ambiguous. We notice, first, that the event/result alternation does not exhaust the possible semantic differences, as indicated in (54), and,

second, that it depends to a large extent on the meaning of the underlying verb, as (55) suggests.

(54) a Die Leitung der Veranstaltung nahm der Direktor wahr. (event)
The leading of the event was done by the director.

b. Die Leitung des Hauses (*durch den Direktor) ist abwesend. (agent)
The administration of the house (*by the director) is absent.

c. Die Leitung ist an zwei Stellen gebrochen. (instrument)
The pipes are broken at two points.

(55) a. Die Konstruktion war bemerkenswert. (event, result, *agent)
The construction was remarkable.

b. Der Sprung war erstaunlich. (event, ??result, *agent)
The jump was astonishing.

c. Die Kontrolle war ärgerlich. (event, ?result, agent)
The inspection was harassing.

d. Die Lenkung ließ viel zu wünschen übrig. (event, *result, instrument)
The steering left much to be desired.

It follows from these examples, which can be multiplied in various directions, that alternative interpretations cannot reasonably be reduced to lexical ambiguities of the relevant suffixes, nor to ad hoc properties of the underlying verbs. The natural assumption is rather that the expressions resulting from nominalization are subject to general principles of semantic interpretation. The principles in question have been discussed, among others, as *conceptual shift* in Bierwisch (1989) and *coercion* in Pustejovsky (1995). The effect of conceptual shift is illustrated for the interpretation of *Kirche* (church) in (56):

(56) a. Die Kirche hatte damals wachsenden Einfluß. (institution, organization)
The church had increasing influence at that time.

b. Die Kirche wird renoviert. (building)
The church is renovated.

c. Er geht regelmäßig in die Kirche. (services)
He regularly attends church.

d. Die Kirche hat ihre Meinung geändert. (institution, personnel)
The church changed its opinion.

Whether, to what extent, and in which way variations of this sort are part of SF or belong simply to the conceptual domain interpreting linguistic expressions is controversial. As far as the distinctions lead to grammatical consequences, it seems reasonable, or even mandatory, for them to be recognized in SF. One proposal to this effect assumes so-called *templates*, which are inserted into SF, but do not change the corresponding PF. In a way, templates can be construed as pseudo-affixes, i.e. affixes without phonetic content. As a simplified illustration, (57a) may be considered as the template that would turn the organization reading of *Kirche*, abbreviated in (57b) into the item (57c), which refers to the church as a building.

(57) a. λX λz [[BUILDING z] ∧ [[z LOCATION-OF x] ∧ [X x]]]

b. / *kirche* / [+N, +Fem] λ y [CHURCH y]

c. / *kirche* / [+N, +Fem] λ z [[BUILD z] ∧ [[z LOCAT x] ∧ [CHURCH x]]]

Likewise, the result template (58) would turn an event noun like *Berechnung* outlined in (48) above into a result noun as indicated in (59):

(58) λX λz [[z RESULT-OF e] ∧ [X e]]

(59) / *be-rechn-ung* / [+N, +Fem]
λx λy λz [[z RESULT-OF e] ∧ [e INST [y CALCULATE x]]]

According to this outline, (58) shifts the reference to an event to reference to its result, supporting an appropriate reading for cases like *seine Berechnung der Preise hat Fehler* (his calculation of the prices contains errors). Even though non-trivial details have to be added, the basic idea should be clear that grammatically correct derivations are available for various shifts on the basis of principles that regulate semantic interpretation quite generally. The difference between simple and complex nominalizations is essentially a consequence of the optionality of nominal complement positions.

12.9 Syntactic and conceptual conditions on argument realization

These observations may contribute to an account for another problem involved in the argument structure of de-verbal nouns. The point is that, even if the argument structure of an underlying verb is obviously inherited under nominalization, its positions seem to have different chances and conditions to be realized within the resulting noun phrase:

(60) a. die Untersuchung der Studenten
the examination of the students

b. die Zerstörung der Kirche
the destruction of the church

c. die Beobachtung der Fahrgäste
the observation of the passengers

d. die Tötung der Besiegten
the killing of the victims

e. die Instruktion der Kandidaten
the instruction of the candidates

In these constructions, the complement is preferably or even obligatorily interpreted as corresponding to the object, rather than the subject of the underlying verb. Hence the optionality of the inherited argument positions seems to be unequal. This asymmetry has been considered as a strong argument for the syntactic nature of nominalization, as the difference can be accounted for if the underlying configuration is assumed to consist of a VP which includes the verb and its complement, but not the external argument of the verb. See Alexiadou (2007b) for discussion of this proposal. This account would also include nominals based on unergative verbs like *verfallen* (decay), *ankommen* (arrive), whose subject is supposed to be VP-internal:

(61) a. der Verfall des Hauses
the decay of the house

b. die Ankunft der Mannschaft
the arrival of the team

c. die Austrocknung der Flüsse
the drying of the rivers

However, in spite of various sub-regularities like those mentioned in footnote 31, the asymmetry is as spurious as the distinction between simple and complex event nouns, presumably not only in German.[33] This is shown by cases like (62) and (63):

(62) a. Peters Verteidigung des Vorschlags
Peter's defence of the proposal

b. die Verteidigung Peters
the defence of Peter

[33] That there are serious problems for this analysis with respect to primary data not only in German is recognized in Alexiadou (this volume) and Harley (this volume).

c. die Verteidigung des Vorschlags
the defence of the proposal

d. *die Verteidigung Peters des Vorschlags

e. *die Verteidigung des Vorschlags Peters
the defence of the proposal by Peter

(63) a. Oskars Beleidigung der Gäste
Oskar's insulting of the guests

b. die Beleidigung Oskars
the insulting of Oskar

c. die Beleidigung der Gäste
the insulting of the guests

d. *die Beleidigung Oskars der Gäste

e. *die Beleidigung der Gäste Oskars

f. die Beleidigung der Gäste durch Oskar
the insulting of the guests by Oskar

The main point to be noted here is the ungrammaticality of two post-nominal genitive NPs, a combination that is excluded by general constraints on the surface structure of German noun phrases.[34] Thus, while the argument positions of transitive verbs like *verteidigen* (defend) or *beleidigen* (insult) are inherited under nominalization, their (optional) realization must be in accordance with the surface constraints in question. If only one complement shows up, its possible or preferred interpretation is primarily a matter of s-selection, that is, of the meaning of the (underlying) verb and the complements, as discussed earlier. Thus, (62b) is ambiguous – Peter might be the agent or the theme of the defence – while (62c) is unambiguous, due to s-selection, because a proposal is not a possible defender. For (63), this sort of asymmetry does not hold, as both Oskar and the guests may be agents and targets of the insult. The ungrammaticality of (62d) and (62e) disappears if one genitive NP is turned into PP as in (62f). This applies equally to (63e). In much the same way, the decision between agent and goal interpretation of genitive in (64a) and (64b) depends on the fact that *Güllen* is the name of the place the old lady comes to see:

[34] In line with this restriction, (62e) is well formed, however, if the genitive NP *Peters* is construed as a complement of *des Vorschlags* and not of *Verteidigung*, such that [*des Vorschlags Peters*] is the only complement of [*die Verteidigung*]. The same observation holds for (63e), which is grammatical if parsed as [*die Beleidigung* [*der Gäste Oskars*]].

(64) a. der Besuch der alten Dame
the visit of the old lady

b. der Besuch Güllens
the visit of Güllen

c. der Besuch der alten Dame in Güllen
the visit of the old lady in Güllen

d. der Besuch Güllens durch die alte Dame
the visit of Güllen by the old lady

e. *der Besuch der alten Dame Güllens
the visit of the old Lady of Güllen

As in (64) the agent as well as the goal can be realized by a PP, there are two ways to bypass the constraint against double post-nominal genitive NP in (64e).

Further contextual conditions can influence the choice of the argument position, as shown by the following examples:

(65) a. Die Wahl des Präsidenten fiel auf seinen Bruder.
The vote of the president was for his brother.

b. Die Wahl des Präsidenten war eine langwierige Sache.
The election of the president was a protracted affair.

The president might be the agent or the patient of voting – *die Wahl des Präsidenten* is correspondingly ambiguous. If however the context prevents the president from being the target of the vote, as in (65a), then the interpretation is unambiguous. Hence the complement *des Präsidenten* realizes the subject position of the underlying verb.[35] Even more background knowledge is involved in (65b), whose interpretation is unambiguous, since the public election of the president, but not the president's own vote, can naturally become a protracted event. Hence the complement can only be construed as the object of the vote. Notice, incidentally, that this sort of encyclopedic knowledge does not affect the inherited argument structure of the noun *Wahl* (election/vote), but only the choice among equal possibilities.

As shown by cases like (62) to (64), the realization of argument positions is subject to syntactic surface constraints on complex noun phrases. Although these constraints cannot be dealt with here in necessary detail, it can easily be

[35] There is perhaps a different interpretation of (65a) – not fully legitimate, though – according to which *die Wahl des Präsidenten* would refer to the result of the vote, such that (65a) is construed as something like 'His brother was elected as president'. This would be as matter of conceptual shift, however, in addition to the interpretation of the argument position.

shown that they apply to noun phrases in general, not just to nominalizations. Besides the exclusion of more than one post-nominal genitive NP illustrated in (62) to (64), various other constraints must be recognized, including, in particular, restrictions on pre-nominal genitives, as shown in (66):

(66) a. Luthers Übersetzung der Bibel
Luther's translation of the Bible

b. seine Übersetzung der Bibel
his translation of the Bible

c. Luthers Übersetzung
Luther's translation

d. ?des Reformators Übersetzung
the reformer's translation

e. ??der Bibel Übersetzung
the Bible's translation

f. ihre Übersetzung
its translation

g. *der Bibel Übersetzung Luthers
the Bible's translation of Luther

h. *ihre Übersetzung Luthers
its translation of Luther

i. ihre Übersetzung von/durch Luther
its translation by Luther

A crucial factor that plays a role for the privilege to occur in pre-nominal position seems to be a ranking that follows the definiteness hierarchy (67), which is relevant in various connections. See Jäger (2007) for recent discussion:

(67) Possessive Pronoun > Proper Noun > Definite NP

Although the constraints in question are clearly in need of a more systematic analysis than can be provided here, it might still be emphasized that they are not bound to de-verbal nominalization. As shown in (68), relational nouns and their complements are subject to the same conditions as those illustrated in (66).

(68) a. Dürers Porträt seiner Mutter
Dürer's portrait of his mother

b. sein Porträt seiner Mutter
his portrait of his mother

c. Dürers Porträt
Dürer's portrait

d. ?des Künstlers Porträt
the artist's portrait

e. ??seiner Mutter Porträt
his mother's portait

f. ihr Porträt
her portait

g. *seiner Mutter Porträt Dürers
his mother's portrait of Dürer

h. *ihr Porträt Dürers
her portrait of Dürer

12.10 Remarks on nominal infinitives

To conclude this incomplete discussion of de-verbal nominals, some remarks on nominalized infinitives are called for. As is well known, for any German verb the infinitive with the suffix *-en* functions as an event noun of neuter gender. The resulting nominal is always available; either alongside the corresponding event nominalization (with more or less different semantic interpretation) or as the item that fills the gap idiosyncratically left by nominalizations. Examples are given in (69):

(69)

a.	das Wählen	die Wahl	(voting)
b.	das Springen	der Sprung	(jumping)
c.	das Berechnen	die Berechnung	(calculating)
d.	das Kommen	Ø	(coming)
e.	das Denken	Ø	(thinking)
f.	das Treffen	Ø	(meeting)
g.	das Einschlafen	Ø	(falling asleep)
h.	das Leben	Ø	(living)
i.	das Lachen	Ø	(laughing)
j.	das Hören	Ø	(hearing)

Two general remarks are to be made about these elements, which I will call nominalized infinitives. First, most but not all of these elements strictly exclude plural formation: although *die Treffen* (the meetings), *die Leben* (the

lives), and a few others are idiosyncratically possible, **die Lachen*, **die Einschlafen*, **die Denken*, and all others are impossible. Second, nominalized infinitives inherit in principle the AS of the verb, but with the usual conditions on nouns, that is, structural arguments become optional positions assigning genitive:

(70) a. das Berechnen der Werte
the calculation of the values

b. Peters Lachen
Peter's laughing

c. sein langsames Einschlafen
his slowly falling asleep

d. das Kommen so vieler Leute
the coming of so many people

There are further systematic and idiosyncratic conditions these constructions are subject to, but this is not the place to discuss them.[36]

The regular properties of these elements can be captured by an affix indicated in (71), which is similar to suffixes like (46), repeated here as (72), but differs in two crucial respects: nominalized infinitives don't allow plurals (exceptions must be idiosyncratically marked), and they are not restricted to particular classes of verbs by the address feature F_i in their c-selection.

(71) / *-en* / [+N, +Neuter, –Plur] λY [+V] [Y]

(72) / *-ung* / [+N, +Fem] λY [+V,+F_i] [Y]

In addition to the nominalized infinitives in (70), German has a further possibility to create nominal infinitives, which is shown in (73):

(73) a. das sich einer neuen Aufgabe Zuwenden
the turning to a new task

[36] Thus, the standard realization of complements is not always possible.

(i) das Singen der Marseillaise
the singing of the Marseillaise
(ii) ??das Hören der Marseillaise
the hearing of the Marseillaise
(iii) Das Anhören der Marseillaise
the listening to the Marseillaise

It remains to be explored whether and which more general conditions (such as perception vs. activity verbs) might be at stake here.

b. das ihm die Arbeit Überlassen
the leaving him the work

c. das alles überdenken Wollen
the wanting to think it all over

d. das sich immer schon informiert Haben
the being always already informed

e. das In-der-Welt-Sein
the being-in-the-world

For want of a better term, I will call these constructions *verbal nominals*. Three characteristic points are to be noted. First, while the infinitives in (70) have nominal argument structure, those in (73) clearly retain the c-selectional properties of verbs. They provide argument positions for dative, accusative, and reflexive NPs, all of which are excluded from proper nominal ASs, whereas genitive NPs, characteristic for c-selection conditions of nouns, do not show up. Hence differing from the nominalized infinitives in (70), the head of verbal nominals in (73) must be categorized as verb with a regular verbal AS. Second, the constructions in (73) must be based on proper syntactic VPs, because they do not meet the general surface conditions on NPs discussed in the previous section. Rather they are organized according to general conditions on VP-syntax, including in particular the characteristic verb-final position. Third, the constructions in (73) as a whole are nevertheless categorized as singular neuter nominals. This cannot be due to the suffix *-en* of nominalized infinitives, since verbal nominals retain their verbal properties. The nominal categorization is rather a consequence of the definite determiner *das* which combines with the VP as a functional head, mediating also the event reference of the verbal nominal (in much the same way in which event reference is mediated in nominal infinitives).

It follows from these considerations that, although both verbal nominals and nominal infinitives turn on the suffix *-en*, still two different entries must be at stake, categorized as [+V] and [+N, +Neuter] respectively. Both are semantically vacuous, contributing merely to PF and GF of the resulting combination. Hence, in addition to the suffix (71) for nominalized infinitives, a further entry (74) must be assumed, on which verbal nominals can rely:[37]

[37] This suffix is presumably just the morpheme of bare infinitives entering regular verbal infinitive constructions, such that the nominalizing determiner simply selects a complement categorized as [+V, −Finite].

(74) / *-en* / [+V, −Finite] λY [Y]
[+V]

A number of non-trivial problems are in need of further clarification. Thus, verbal nominals can end up only as singular neuter DPs; hence somewhere in their derivation the selection of gender and number must take place. Moreover, the subject position of the underlying verb can only be realized as a genitive NP, according to the standard conditions of nominal c-selection. For instance, (73e) could be expanded to *Evas In-der-Welt-Sein* (Eva's being-in-the-world), but not to **Eva In-der-Welt-Sein*. I must bypass the details that would account for these matters.

We now have three types of nominalized verbal constructions as shown in (75).[38]

(75) a. die Besteigung des Gipfels (nominalization)
the ascension of the peak

b. das Besteigen des Gipfels (nominalized inf)
the ascending of the peak

c. das den Gipfel Besteigen (verbal nominal)
the ascending the peak

These options vary strongly with respect to their stylistic acceptability. Verbal nominals are fairly marginal under most conditions. Furthermore, the range of natural interpretation is restricted in different ways, decreasing from (a) to (c). Ignoring these aspects, the relevant morpho-syntactic characteristics can be indicated as follows:

(76) a. $[_{DP}\ [_{D}$ die $]\ [_{NP}[_{N}$ Besteig$_{V}$ - ung$_{N}$ $]\ [_{DP}$ des Gipfels $]\ ]\ ]$

b. $[_{DP}\ [_{D}$ das $]\ [_{NP}\ [_{N}$ Besteig$_{V}$ - en$_{N}$ $]\ [_{DP}$ des Gipfels $]\ ]\ ]$

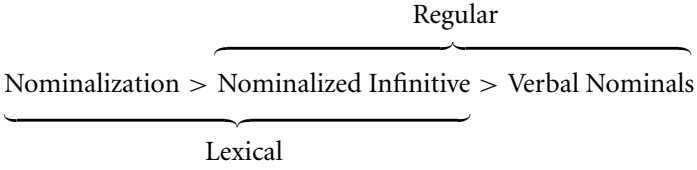
c. $[_{DP}\ [_{D}$ das $]\ [_{VP}\ [_{DP}$ den Gipfel $]\ [_{V}$Besteig$_{V}$ - en$_{V}$ $]\ ]\ ]$

The common property of (75a) and (75b) is the morphological origin of its nominal categorization, the consequences of which are realized by Cat and AS of the resulting noun. This contrasts with (75c), whose nominal properties are due to the strictly extra-lexical, syntactic combination with Det. On the other hand, (75a) differs from (75b) and (75c) by the fact that it is based on the suffix *-ung*, which competes with a number of alternative options, requiring therefore the address feature $[+F_i]$ to be included in its c-selection, as discussed

[38] These are, in fact, the types discussed already in Chomsky (1970). It must be emphasized, however, that, in spite of obvious similarities between English derived nominals and gerundive nominalization on the one hand and German nominalized infinitives and verbal nominals on the other hand, relevant differences in detail must be recognized.

in section 12.7. Now, address features are a major part of idiosyncratic lexical information. Since the suffix *-en* has no competitors, it doesn't need address features, as indicated in (71) and (74), and is hence not subject to the sort of idiosyncrasy which typically shows up in derivational morphology. Therefore, nominalized infinitives and verbal nominals are less prone to idiosyncratic specification. These comments can schematically be summarized as follows:

(77)



This suggests a scale where one end is marked by constructions that can depend on idiosyncratic, lexically fixed information determining morphological processes, while the other end is marked by constructions that are based on strictly regular conditions on purely syntactic processes. Such a scale indicates tendencies, however, not categorial distinctions. On the one hand, lexical and morphological information necessarily relies on systematic principles and interacts with syntactic processes. On the other hand, all syntactic configurations can become lexical entries, if enriched by idiosyncratic information.[39]

12.11 Conclusion

The inclination to consider nominalization (and word formation in general) as either a matter of the syntactic component or as part of the lexicon, or rather as either an intra- or extra-lexical process, depends to a large extent on two factors. One factor is the concept of the lexical system one adopts, that is, of the structure of lexical entries and the operations applying to them. The other factor is the emphasis one puts either on the role of idiosyncratic information or on systematic structures and processes. Assuming that the role of idiosyncrasies tends to be underestimated, I have argued that they are not simply unavoidable but are in fact a characteristic phenomenon in nominalization and must appropriately be taken into account.

The main point of the present discussion is the observation that nominalization must be recognized as drawing on systematic principles as well as on idiosyncratic information. More specifically, the lexical aspect of nominalization relates to the role of idiosyncratic information, but also to the conditions on underspecification, which crucially apply to lexical information.

[39] A case in point is (73e): *das In-der-Welt-Sein* was introduced as a technical term in Heidegger's philosophy, from which it spread into general usage.

The syntactic aspect on the other hand comes in through the combination of heads and complements (or adjuncts) and its semantic consequences, but also through the surface conditions that control, among others, the realization of argument positions the lexical entries provide.

The format proposed for the representation of idiosyncratic information and its impact on derivational operations is crucially based on specific types of features. These address features regulate the compatibility between major lexical items and derivational affixes. They do not merely represent item-specific combinatorial conditions by which derivational processes depend on individual lexical items, but by the same token they reflect aspects of the organization and functional architecture of the lexical system as a whole. In general, then, the lexicon is not a separate component alongside phonology, morphology, syntax, and semantics. Rather it feeds and depends on all of them. It thus remains the locus of all idiosyncratic information, but is still not merely a huge set of idiosyncrasies.

To sum up, nominalization has been proposed to be based on the following components:

(78) a. general principles of lexical information, including conditions allowing for underspecification;

b. the set of all entries providing all and only the idiosyncratic information;

c. general principles of syntactic combination (merge) and their semantic consequences (functional composition and application);

d. syntactic conditions on surface realization.

These components and their interaction can be implemented in various ways. Borer (1998) discusses various frameworks in terms of which the present proposals could be couched.

13

The morphology of nominalizations and the syntax of *v*P*

HEIDI HARLEY

13.1 Introduction

In a 'pervasive syntax' approach to morphologically complex forms, like that of Distributed Morphology (DM in the following), the analysis and structures proposed for a form must also be contained within the analysis of any structure derived from that form. That is, in the same way that the structural analysis for *Mary left* is contained within the structural analysis for *John said that Mary left*, the structure for *marginalize* must be contained within the structure for *marginalization*.

When morphological structure and semantic composition coincide, as in this example, this is hardly controversial, but in cases where morphological structure is present but the expected semantics is not, as in *transmit* and the car part *transmission*, or as in *organize* and *organization* (a company) the usual approach has been to propose reanalysis and an opaque internal structure in the semantically divergent derived form (also known as 'lexicalization' and/or 'reanalysis'). In contrast, when syntactic structures have both idiomatic and compositional interpretations, the meaning drift in the idiomatic interpretation has usually not been taken to indicate any fundamental alteration of the syntactic structure associated with the string. *Play with a full deck* participates in the morpho-syntactic structure like a verb phrase, even when its interpretation is not compositional, and it seems clear that chunks of

* I would like to thank Artemis Alexiadou, Hagit Borer, Eric Reuland, and Tom Roeper, as well as the participants of the Saarbrucken Workshop on QP Structure, Nominalizations, and the Role of DP and the Syracuse/Cornell Workshop on the Internal Syntax of Nominalized Clauses for valuable feedback. Special thanks to Andrew McIntyre, Monika Rathert, and Anastasia Giannakidou for their comments on the pre-final draft. All mistakes and inadequacies remain my own responsibility.

structure larger than a single syntactic terminal node are able to associate with particular idiosyncratic meanings. When the same point is applied to complex morphological structures, the moral is the same: the structure required by the morphemes must be present even when the meaning of the whole is not compositional. Reanalysis is not necessary to explain idiomatized interpretations in either morphology or syntax.

In English nominalizations, however, one type of meaning shift – from event to result readings – seems to be quite productive and predictable, and hence hardly idiomatic. These meaning shifts do not affect the internal morphological structure of the nominalization, which entails that in a DM approach, the complete structure must be present. However, they do affect the argument structure of the nominalization, ruling out the presence of the internal argument that is mandatory on the event interpretation (Grimshaw (1990)). This challenge to a DM approach to English nominalizations was first laid out in detail in Borer (2003a), as well as in Alexiadou (this volume) and Ackema & Neeleman (2004), and is taken up here. This chapter explores first what that internal structure must consist of, by considering the syntax of verb-particle constructions and their behaviour in mixed nominalizations, then identifies particular verbal morphemes with particular syntactic terminals. This points to certain conclusions about the structure of the verb phrase, and the meaning contributions of certain sub-components. Finally, some discussion is presented about the problem of how to derive the result nominalization meaning, given the necessary conclusion, for DM, that they have verbal syntactic structure contained within them.

The central point is that taking the morphology–syntax relationship seriously strongly constrains what can be proposed in terms of a structural representation of nominalizations.

13.1.1 *DM background*

As noted above, DM proposes to adopt a syntax-based approach to word structure. There are three foundational claims that are relevant to the current discussion:

(1) a. DM is *piece-based*: Morphemes are independent entities that occupy terminal nodes of a hierarchical structure built by the syntax with normal syntactic processes.

b. DM is *realizational*: The syntactic terminal nodes are fully specified for featural (and semantic) content. Each terminal node receives a pronunciation after the syntax is finished. The terminal nodes are

thus *realized* post-syntactically by morphemes, called 'vocabulary items', (VI in the following).[1]

c. VIs may be underspecified for feature content, and compete for insertion into a terminal node via the Elsewhere Principle. Hence a single VI could win competitions for nodes with quite different syntactic (and semantic) specifications.

The key point, for present purposes, is that wherever you see a morpheme, there must be a corresponding a terminal node in the structural analysis of the sentence.[2] Where you do not see a morpheme, there may or may not be a terminal node filled by a Ø element; this happens all the time in English. But it is at least sure that where you do see a morpheme, there had better be a terminal node.

There are only two broad classes of terminal nodes in DM: roots ($\sqrt{}$s, what Harley & Noyer (2000b) call *l-morphemes*) and grammatical elements of various kinds (*f-morphemes*).[3] Roots are acategorial, acquiring a category by virtue of the f-morphemes they are merged with in the syntax. The category-creating f-morphemes are usually labelled with the lower-case version of the lexical category they correpond to: a verbalizer is a v°, a nominalizer is an n°, an adjectivalizer is an a°.

13.2 Some possibilities in the syntactic analyses of process nominals

To begin, let us consider the proposal of Kratzer (1993), Kratzer (1996) concerning the derivation of *-ing* nominals in English. There are several classes of such nominals, first characterized comprehensively by Lees (1960). Here, we will consider only the contrast between the broadly verbal *-ing* forms, the 'ACC-ing' class, and the broadly nominal *-ing* forms, the 'OF-ing' class.[4]

[1] Here I'll often use 'morpheme' to refer to individual VIs, like *-ed*, *-ation*, *cat*, rather than to the abstract terminal node into which VIs are inserted, although technically DM terminological convention has generally reserved 'morpheme' to refer to the latter (as in 'dissociated morpheme') and VI to the former.

[2] The terminal node may be originally syntactic (that is, have originated as part of the numeration and been added to the structure via syntactic merge), or inserted as a 'dissociated' morpheme/terminal node at morphology, prior to vocabulary insertion (see, for example, Embick (2000)). All the morphemes of concern here, however, seem to have a syntactic origin (except, possibly, for *of*; see the note at the end of this section concerning Last-Resort *of*-insertion).

[3] Harley & Noyer (2000b) intended 'l-' and 'f-' to evoke 'lexical' and 'functional', respectively, though they are not strictly speaking to be interpreted as such; 'lexical', in particular, is not a relevant concept within the DM framework.

[4] 'ACC-ing' and 'POSS-ing' gerunds are grouped together here in opposition to '*of*-ing' mixed nominalizations because they both license accusative objects and admit adverbial modification. However,

(2) a. ACC-*ing* nominalizations (Lees (1960))
Belushi('s) foolishly mixing drugs and alcohol was the cause of his death.

b. OF-*ing* nominalizations
Belushi's foolish mixing of drugs and alcohol was the cause of his death.

(3) ACC-*ing* properties:
Verbal characteristics:
accusative case assignment, adverbial modification
OF-*ing* properties:
Nominal characteristics:
of-case assignment, adjectival modification

Kratzer proposed an analysis, according to which the difference between the two types had to do with whether the *-ing* suffix is attached above or below a subject-introducing projection that she termed VoiceP. This 'high/low attachment' analysis is essentially a modernized interpretation of Abney's analysis (Abney (1987)).[5] If *-ing* attaches outside the VoiceP, the result is the ACC-ing type; if *-ing* attaches to the VP without a VoiceP, the result is an OF-ing structure. These structures are illustrated below.

Siegel (1997) has shown that they differ in an interesting way with respect to their event reference. OF-ing nominalizations can comfortably appear in achievement-entailing, accomplishment-entailing, and activity-entailing frames (ia, iia, and iiia, respectively below). POSS-ing gerunds (ib, iib, and iiib) do not fit in any temporal-content-entailing sentences. ACC-ing gerunds, in contrast, fit in accomplishment-entailing frames (iiic), though not in achievement- or activity-entailing ones (ic and iic). She concludes that accusative-assigning gerunds are progressive AspPs, not nominal at all. This would solve the problem raised below in fn 6, but entails that there are two different *-ing* suffixes, losing the insight of the 'high-low' approach introduced immediately below.

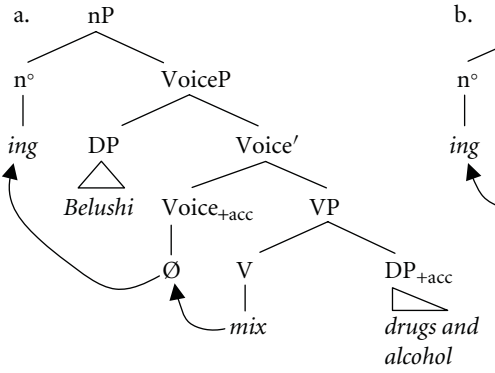
(i) a. Belushi's mixing of drugs and alcohol takes place here.
b. *Belushi's mixing drugs and alcohol takes place here.
c. *Belushi/PRO mixing drugs and alcohol takes place here.

(ii) a. Belushi's mixing of drugs and alcohol took place at 3:07 precisely.
b. *Belushi's mixing drugs and alcohol took place at 3:07 precisely.
c. *Belushi mixing drugs and alcohol took place at 3:07 precisely.

(iii) a. Belushi's mixing of drugs and alcohol takes an hour.
b. *Belushi's mixing drugs and alcohol takes an hour.
c. Belushi mixing drugs and alcohol takes an hour.

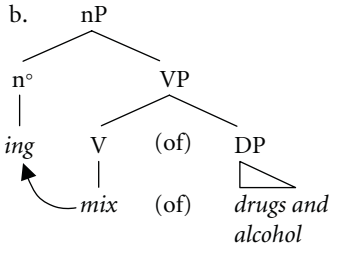
[5] Alexiadou (this volume) presents a similar type of syntactically based analysis for Greek deverbal nominals, where the different positions correlate with differences in the nominalizing morphology.

(4) a.



'PRO/Belushi('s) mixing drugs and alcohol'

b.



'(the/Belushi's) mixing of drugs and alcohol'

The assumptions underlying this approach are that accusative case, as well as the subject theta-role, are associated with the Voice head – thus deriving Burzio's generalization. The necessity of Last-Resort *of*-insertion in the OF-ing cases, then, results from the absence of the VoiceP, and hence the absence of accusative case in the structure. (In the structure in (4a), the external argument must be case-marked by some higher projection, possibly a 'gerund' head.)

In (4b) any 'external argument' is a simple possessor, introduced in Spec-DP in the normal way. It is not assigned the Agent theta-role, but rather is composed with the event nominal via the familiar 'possessive nexus' – an underspecified relationship licensed by the possessor configuration. In (4a), the external argument receives an Agent theta-role from Voice and must be interpreted as such. In (4b), while an Agent interpretation is available for a possessor such as *Belushi*, so too is any other suitable association, for example a mixing of drugs and alcohol carried out on Belushi's behalf by some intermediary. This type of associative interpretation for *Belushi* is unavailable in (4a). See Marantz (1997), among many others, for further discussion of the underspecified semantics of the possessive nexus.

It was immediately natural to associate Kratzer's external-argument-introducing VoiceP with Hale and Keyser's agent-introducing outer VP shell, or Chomsky's agent-introducing vP shell. Distributed Morphologists (Harley (1995), Marantz (1997)) also identified the verbalizing v° head with the external-argument introducing vP shell, so that in Kratzer's structures in (4), the lower VP head could not appropriately be termed a VP anymore – the head projecting it would be an acategorial root, rather than a proper verb. It would only be after the lower $\sqrt{}$ affixed itself to the upper v° via head-movement that the resultant complex head could be called a 'verb.'

This latter conflation of Voice° with the verbalizer v° seemed to offer some promising leverage on the verbal vs. nominal properties of the two types of gerund. If VoiceP is the same as DM's verbalizing vP, then its presence in (4a) accounts for the verbal categorical properties of ACC-ing gerunds, especially their ability to take adverbial modification, include auxiliary sequences, and so on – the verbal characteristics of these gerunds would follow because there is a genuine verb in the structure, created by the presence of the Voice°/v° head.[6] The absence of this head in (4b), on the other hand, accounts for the emphatically nominal characteristics of OF-*ing* nominalizations – allowing adjectival modification, not permitting auxiliaries, permitting determiners, and so on. The absence of Voice°/v° would entail that at no level would the OF-*ing* structure ever be fully verbal.[7]

Harley & Noyer (1997) proposed to extend Kratzer's approach to account for another syntactic difference between OF-*ing* and ACC-*ing* structures. ACC-*ing* structures continue to exhibit fully verbal behaviour when they are formed from verb-particle complex predicates, namely, they continue to allow particle shift. OF-*ing* structures, on the other hand, do not permit particle shift. This is illustrated in (5) below: (5a–b) show the basic particle-shift phenomenon; (5c–d) show that particle shift is possible in ACC-*ing* gerunds, and (5e–f) show that particle shift is degraded in OF-*ing* nominalizations, as first noted in Chomsky (1970).

(5) a. Chris **wrote** the paper **up**.
b. Chris **wrote up** the paper.
c. Chris writing the paper up so quickly surprised Pat.
d. Chris writing up the paper so quickly surprised Pat.
e. *Chris's **writing** of the paper **up**
f. Chris's **writing up** of the paper

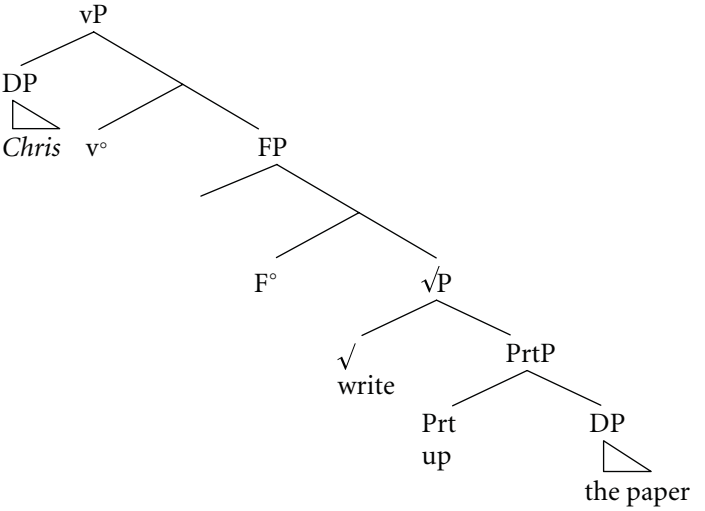
Harley & Noyer (1997), following the proposals of Johnson (1991) and Koizumi (1993), proposed an analysis of particle shift based on two key factors: (a) short

[6] There is a problem with this approach, however. If *-ing* in (2a) is the same n° *-ing* as in (2b), the analysis doesn't obviously help with the unavailability of determiners and adjectival modification – if it is the same nominalizing *-ing*, then one would expect that, from the outside, the ACC_{ing} gerunds should behave like regular nPs. See fn 4 above. It is possible that the properties of *-ing* differ when it is adjoined within the l-syntactic domain and outside of it; a similar conclusion is reached by Guéron (in press) with regard to the verb *have*. We leave this problem for future work.

[7] VoiceP is the boundary between 'lexical' (idiosyncratic, idiomatic, derivational) operations and 'syntactic' (productive, compositional inflectional) operations in the syntax-based approach. Its presence or absence in particular derivations would be the key to approaching the type of problem raised in Siloni & Preminger (this volume).

object movement to a case-checking position internal to vP, and (b) optional incorporation of the particle into its selecting verb.[8] That analysis is illustrated in (6)–(8) below. The particle + object form a ParticlePhrase constituent – a small clause that provides a result state for the verbal action, much along the lines proposed by Ramchand & Svenonius (2002), and in much work on clausal event structure before and since (see, for example, Giannakidou & Merchant (1999)). The FP is a case-checking position (AgrO in the original analysis) to which all accusative objects in English must move.[9]

(6) Structure before any movement:

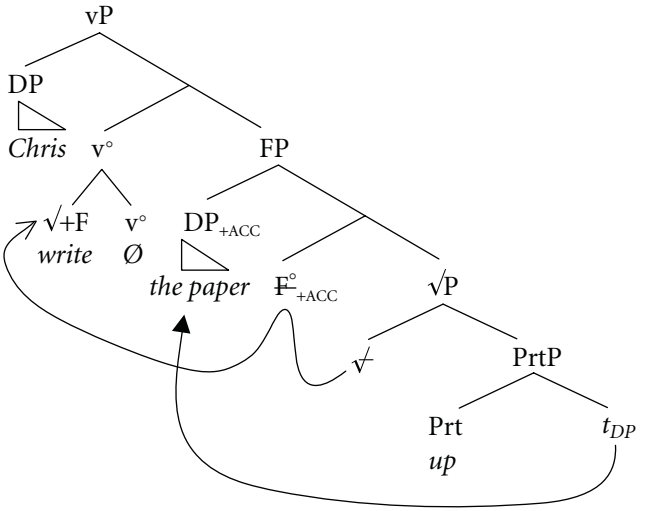


Following head movement of the verb root through F° to v° and movement of the object DP to spec-FP to check its accusative case, the final order of terminal nodes will give *Chris wrote the paper up*.

[8] Den Dikken (1995) argues that the particle must head its own projection since the particle may be modified like a regular PP, by adverbials like *right* or *straight*: *He wrote the paper right up*. This modification is only possible in the V-O-P order, however; when the particle is adjacent to the verb, it is impossible: **He wrote right up the paper*. On the analysis proposed by Harley and Noyer, this follows because, on the V-P-O order, the V-P sequence is a complex head; the modifier *right* cannot intervene inside the complex head. The modifiable PrtP lower in the structure contains a trace. It remains an open question as to why the trace cannot itself be modified: **He wrote up the paper right* (on the relevant 'quickly' reading).

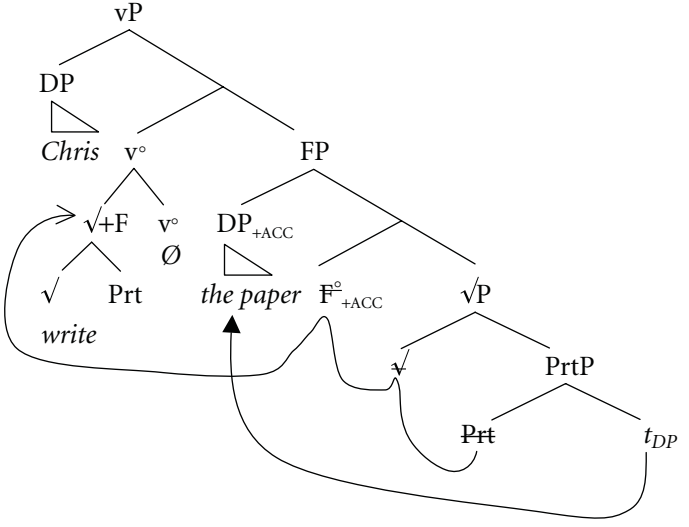
[9] Koizumi exploits the presence of the purely morpho-syntactic projection AgrO to account for a well-known but problematic generalization about English syntax: Stowell's Adjacency Condition (Stowell (1981)).

(7) Chris wrote the paper up.



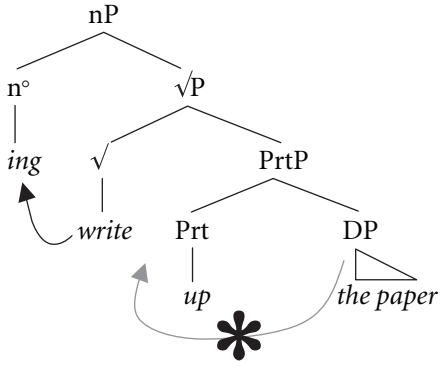
Assuming that the result-specifying particle may optionally head-move to incorporate into its selecting √, and will then subsequently be carried along by head-movement of the √ to v°, we can provide the following structure for the shifted V-P-O order:

(8) Chris wrote up the paper.



Having established an account of particle shift, let us now turn to the explanation for its failure in OF-*ing* gerunds that Kratzer's approach provides. Let us assume that v° selects for FP. If v° is not present, then FP is not present, and hence accusative case is not present. Applying Kratzer's nominalization proposal to these structures, then, explains why ACC-*ing* allows particle shift, and why OF-*ing* doesn't. In the former case, vP and FP are present in the structure. Hence √-to-v° movement and DP movement to Spec-FP will occur, and, combined with optional Prt incorporation, particle shift structures can be generated. In the latter case, on Kratzer's proposal, vP is absent. Hence FP is also absent. Hence, no √-to-v° or short object movement to Spec-FP are possible: in OF-*ing* nominalizations, the base-generated order is the only possible one. This is illustrated in (9)

(9)

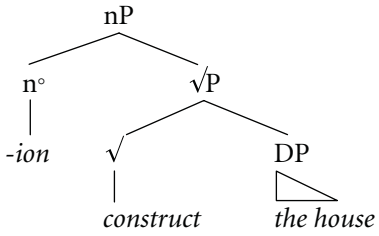


'(the/John's) writing up of the paper'
'*(the/John's) writing of the paper up'

Various kinds of object-licensing projections have been proposed between vP and the lexical verb part of the structure: FP could be equivalent to AgrO, or to AspP, or Ramchand's ProcP, or Borer's AspQP (though see fn. 9). Further, FP has to be absent in the nominalized form for the analysis to work – that is, *of* can not be the realization of the F° head in a nominal context, as for Fu et al. (2001). It is worth noting that Fu et al.'s proposal makes the wrong prediction with respect to ECM in OF-*ing* nominalizations, namely that it should be possible. The point of Chomsky's classical inherent case treatment of *of* is that it is not available in ECM contexts: **John's belief of Mary to be innocent*. I assume here that *of*-insertion takes place into a 'dissociated morpheme' – a terminal node inserted post-syntactically to ensure morphological well-formedness in certain conditions. (For a discussion of the Raising-to-Object approach to ECM necessitated by the system adopted here, see Lasnik (1999).)

Harley and Noyer assume the same structure for regular event nominalizations, which also have an *of*-licensed object DP:

(10)



'(the/John's) construction of the house'

13.3 English verbalizing morphemes

So, taking seriously the notion that v° is the verbalizing head, there are some obvious candidates for overt v° morphemes in English. Among others, there are the verbalizing affixes *-ify, -en, -ize,* and *-ate*. These can combine with roots or stems to form verbs, most obviously verbs with a causative reading, as illustrated in (11):

(11) Causative meanings

a. horrify, gratify, justify, certify, specify, vilify, simplify, passify, objectify

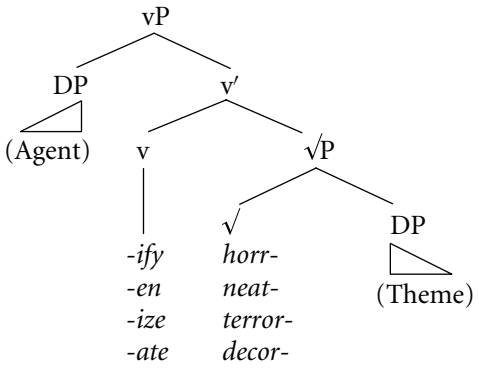
b. deafen, dishearten, dampen, sadden, neaten, coarsen

c. categorize, terrorize, alphabetize, categorize, customize, digitize, idolize

d. complicate, calculate, commemorate, pollinate, decorate, regulate, disambiguate

Given that we take v° above to be equivalent to Kratzer's external-argument-introducing Voice head, or to Hale and Keyser's agent-introducing V head, CAUSE seems like the right kind of meaning for a verbalizer to have. It will introduce the external argument and assign it an Agent or Causer interpretation, and select for some sort of result-state-denoting √P complement (see Giannakidou & Merchant (1999) for an articulated semantics for the v° and √ heads in analogous cases in Greek):

(12)



However, these verbalizers aren't restricted to causative-only environments, as pointed out by Sawai (1997). They may all occur on inchoative/causative alternating verbs. On the inchoative use, of course, these have no Agent argument:

(13) Inchoative/causative alternators

a. coagulate, activate, detonate, dilate, oscillate, correlate, levitate, separate

b. gentrify, emulsify, clarify, unify, petrify, solidify

c. awaken, broaden, whiten, deaden, darken, flatten, freshen, lighten, loosen, ripen

d. crystallize, caramelize, concretize, capsize, depressurize, fossilize, ionize, stabilize

Furthermore, *-ate*, *-ify*, and *-ize* (but not *-en*) all occur on a few purely unaccusative verbs, with no causative alternant:

(14) Unaccusatives

a. capitulate, deteriorate, gravitate, stagnate

b. qualify, stratify, putrefy

c. acclimatize, metastasize, naturalize, specialize

Finally, *-ate*, *-ify*, and *-ize* (but not *-en*) all occur on unergative activity verbs as well (contra Sawai (1997)):

(15) Unergatives

a. dissertate, elaborate, ejaculate, commentate, hesitate, undulate, lactate, vibrate

b. testify, speechify

c. cognize, concertize, fraternize, fantasize, harmonize, temporize, sympathize

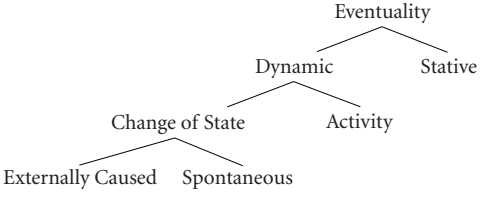
Nonetheless, they are all verbalizers, so in DM they should all be instances of v°. Harley (1995) and Marantz (1997) make clear the need for a v° head to be present in unaccusative verbal structures as well; this v° head would have a different semantics than the external-argument-introducing verbalizer – something closer to 'become' than 'cause'.[10] There must therefore be different varieties, or 'flavours,' of v°, all serving the verbalizing function, but expressing distinct meanings to do with the initiation or lack thereof of the verbal event. Harley (1999), Harley (2005) and Folli & Harley (2006), Folli & Harley (2007) further characterize a stative v°, v_{BE}, and an agentive (rather than causative) activity-denoting v°, v_{DO}. The v°, then, is the locus of the eventive vs. stative distinction in verb types, as well as the distinction between caused or spontaneous events, and the distinction between activity events and change-of-state events. Assuming these distinctions in v° can be morphologically characterized in terms of feature clusters such as [±dynamic], [±change.of.state], [±cause], then we could capture the distribution of the verbalizing affixes via underspecification in the usual DM fashion.[11] (See Rosen (1999: 4–5)

[10] Note that it is straightforward to characterize the relationship between a BECOME operator and a CAUSE operator: the former is just the latter without an external argument – a 'Process' functor without an 'Init' functor, in the terms of Ramchand (2008). In the analysis of Giannakidou and Merchant, the BECOME predicate could have a denotation like the following, substituting a monovalent predicate UNDERGO for the bivalent DO predicate:

(i) $[[\text{ -izo}_{\text{BECOME}}]] \Rightarrow \lambda P \lambda x. \exists e[\text{UNDERGO}(e,y) \,\&\, \exists s[P(s,y) \,\&\, \text{CAUS}(e,s)]]$

Of course, in the syntax proposed here, the object y composes with the result state P before the resulting complete predication is composed with the BECOME v° head (spelled out as *-ize* etc.); in G&M's proposal, the v° and P heads compose first and then are merged with the object. Consequently, G&M's semantics are not strictly compatible with the structural proposal here. The actual v_{BECOME} predicate should take a saturated state of affairs P as an argument and assert the existence of an event in which ¬P changes to P, along the lines in Dowty (1979). Given such an explicit semantic account, a mapping between the features which condition the insertion of VIs *-ize/-ify/-ate* etc. and the LF interpretation of the terminal nodes they realize could be provided. In the ideal world, perhaps, the semantic content itself could condition VI insertion, but given that this seems unlikely to work out in other areas (for example, in formally plural but semantically singular *pluralia tantum* forms like *scissors*), it is unclear that morphosyntactic feature content can be entirely eliminated in favour of semantic representations.

[11] Since these features are in an implicational relationship, it might be that they are organized geometrically, with the attendant consequences for underspecifcation of VIs, and fewer possible distinctions.



and citations therein for similar featural analyses of the various Vendlerian event classes. In addition, here, the additional [±cause] feature is necessary to characterize the distinction between v° with and without external arguments.) In (16), a possible feature specification characterizing each 'flavour' of v° is given:[12]

(16) a. v_{CAUS}: [+dynamic], [+change of state], [+cause]
b. v_{BECOME}: [+dynamic], [+change of state], [−cause]
c. v_{DO}: [+dynamic], [−change of state], [−cause]
d. v_{BE}: [−dynamic], [-change of state], [−cause]

In (17), the VIs for the four verbalizers described above are given, showing which features condition their insertion. Underspecification for [±cause] ensures that they will be able to realize v° in its v_{BECOME} flavour as well as its v_{CAUS} flavour; further, the underspecification of *-ify*, *-ize*, and *-ate* for [±change of state] ensures that they will be able to realize v° in its v_{DO} flavour as well; hence predicting the range of event types possible with each suffix. Each suffix necessarily also comes with a list of stems to which it can attach, as well, since in no case is any of these suffixes a completely productive 'Elsewhere' verbalizer. In English, the Elsewhere v° VI is Ø.

(17) a. *-en*[13] ↔ [$_{v°}$ [+dynamic], [+change of state]] / [$_{A}$ {flat, dead,] white . . . }] _____
b. *-ify* ↔ [$_{v°}$ [+dynamic]] / [$_{\surd}${hor-, clar-, glor- . . . }] _____
c. *-ize* ↔ [$_{v°}$ [+dynamic]] / [$_{\surd}${categor-, terror-, alphabet- . . . }] _____
d. *-ate* ↔ [$_{v°}$ [+dynamic]] / [$_{\surd}${complic-, decor-, regul- . . . }] _____

This is all very well, but it leads to a serious and obvious conflict for the OF-nominal analyses above, which is what we turn to next.

[12] A similar proposal could account for the morphological difference in German between inchoative *enden,*'end (intr)' and causative *beenden* 'end (tr)' discussed by Bierwisch (this volume). The v_{BECOME} head would be realized as a -Ø VI in the context of √ ENDEN, while the v_{CAUSE} morpheme would have a *be-* VI realizing it in the same context. Such morphological differences can thus be straightforwardly accommodated within the DM framework.

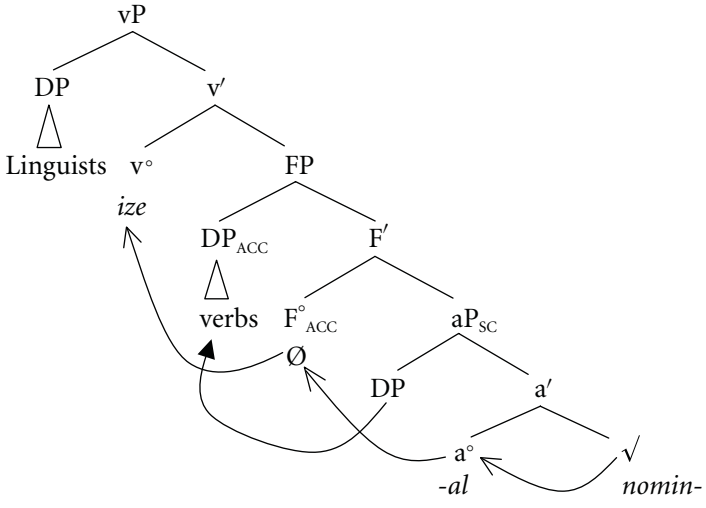
[13] This analysis does not predict that *-en* cannot occur in non-alternating unaccusative stems – the [+change of state] feature specification does not require that a given verb alternate with a causative form, but just that it involve a change of state, as most or all purely unaccusative verbs do. There are two possible approaches to the apparent absence of non-alternating unaccusative *-en* verbs: (a) it is an accidental gap, which could in principle be occupied (perhaps *smarten (up)*, as used in my father's English, is such a form), or (b) there is some characteristic of purely unaccusative verbs that is not captured by the present feature inventory, perhaps [±durative] – many purely unaccusative verbs (*arrive, die*) are achievements, not accomplishments. If that were the case, then *-en* could be specified for [+durative] environments only, and hence be excluded from purely unaccusative verbs.

13.4 The morphology of [[[[nomin]$_{\surd}$al]$_{A}$iz]$_{V}$ation]$_{N}$

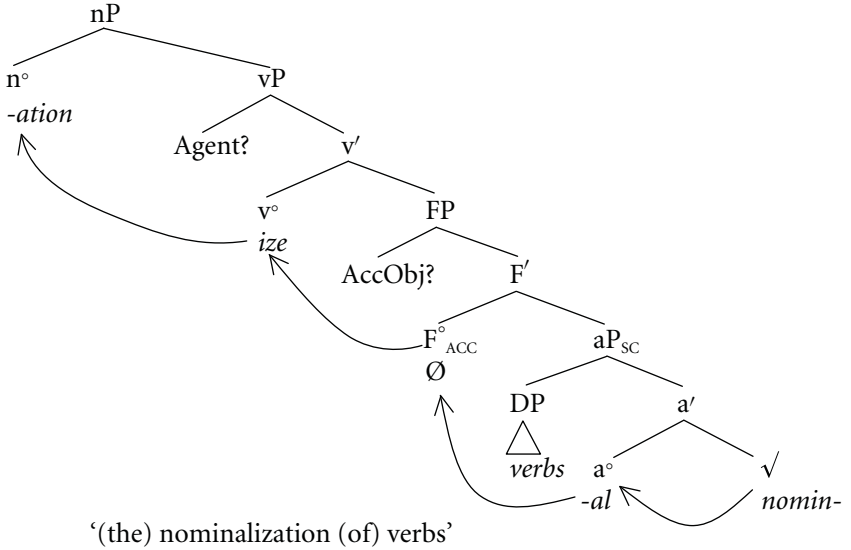
The problem is that all these verbal suffixes occur perfectly happily inside nominalizing affixes, to create de-verbal nouns that then require *of*-insertion to license their objects. This is essentially the problem of inheritance noted by Ackema & Neeleman (2004: Ch. 2), and discussed extensively by Borer (2003a) and Alexiadou (this volume). If the syntax *is* the morphology, and the morphology of the verb is present, where are the verb's syntactic properties? Why, for instance, can't the nominal *nominalization* license accusative case on its internal argument? Recall that above we assume that *-ize* realizes a v°, which (when agentive) may select for an accusative-licensing FP. But, also in the analysis above, it is the absence of a verbalizing v° that accounts for the need for adjectival rather than adverbial modification, and the possibility of a determiner or pluralization in OF-ing nominals as well as in other derived nominals like *destruction*. Yet it is perfectly clear that these derived nominals can contain verbalizing morphemes like *-ize*. In other words, v° must be absent to account for the absence of verbal extended projection properties, but v° must be present to account for the presence of *-ize* within the nominalization.

Given our discussion of categorizing morphemes above, the structure of the verb phrase *to nominalize verbs* and its nominalization *(the) nominalization of verbs* would be as illustrated in (18) below:

(18) a. Internal structure of the vP *(to) nominalize verbs*, as in *Linguists often nominalize verbs*, on analysis of the vP given in (6) above:



b. Given (18a), the structure necessarily contained within *the nominalization of verbs*



'(the) nominalization (of) verbs'

In short, if the verbalizing v° morpheme *-ize* is there, then the nominalizer must be attaching to the vP. If the nominalizer is attaching to the vP, then the external argument and accusative case should be available. They are not available.[14]

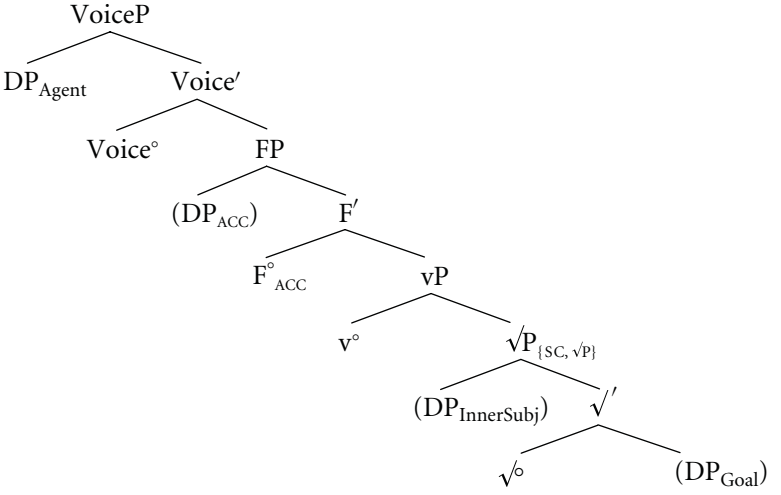
The inevitable conclusion, then, is that the verbalizer v° is not the external-argument-introducing head. Further, the verbalizer v° does not select for the Case-checking head – rather, a separate external-argument-introducing head does.[15] The Agent head and the Case head must project outside the

[14] Fu et al. (2001), in fact, do claim that the external argument and accusative case are available in nominalizations, but that approach runs into trouble in ECM contexts as noted at the end of section 13.2 above. I also follow Chomsky (1970), as interpreted in Marantz (1997), in assuming that true verbal external arguments are not available in OF nominalizations, but rather that certain kinds of agency are licensed in the possessive 'nexus', contra Fu et al. and Roeper & van Hout (this volume). If the verbal external-argument introducer were present in nominalizations, the impossibility of *#John's growth of tomatoes,* or Causer external arguments like *#Adultery's separation of Jim and Tammy Faye Bakker* would be mysterious. If Agents, but not Causers ('Stimuli'), can license the possessive nexus, however, the discrepancy in types of possible external arguments between verbs and their nominalizations can be accounted for.

[15] I have argued against the presence of an intermediate verbal head in past work (Harley (1995), Harley (2005), for example), and I still feel there are significant puzzles associated with the presence of this intermediate verbalizer. Why, for instance, can it not introduce the external argument, or *some* argument, on its own? Why is there not a distinguishable scope for *again*-type adverbials at this level? Why is there so little morphological attestation of the distinct Voice vs. v° heads cross-linguistically? One doesn't see both v_{CAUS} and Voice° independently and simultaneously realized in the morphology

verbalizing v° head, and hence be excludable from nominalizations while still allowing v° to be included. The Agent+Case-head complex, then, takes the verbalizing v° head as its complement – in other words, the complement of VoiceP really is vP, not an acategorial root. The v° is really the lower V head in the split-VP structure; its complement is the SC or event-or-entity-denoting thing which determines the extent of the event via a homomorphism, in the terms of Harley (2005) and Folli & Harley (2006). I assume the v° head is equivalent to the ProcP head of Ramchand (2008).[16]

(19) Full verbal structure thus far including agent-introducing head

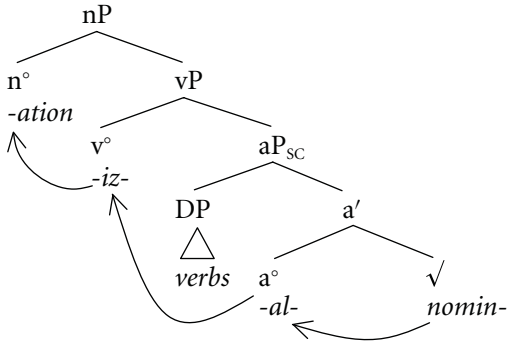


of verbs (Harley (2005)). However, see Marantz (2001a), Pylkkänen (2002), Collins (2005), Merchant (2007), Travis (to appear) and Harley (2007) for additional arguments in favour of VoiceP ≠ vP.

[16] I shudder to confess, but an apparent difference between OF-*ing* nominalizations and irregular event nominals in *-tion* and similar affixes may motivate a reorganization of the structure in (19) and yet more structure on top of that. The judgements are unclear, but it seems that OF-*ing* nominals may allow any kind of agent argument – *John's growing of tomatoes, Adultery's separating of Jim and Tammy Faye*. (These NPs improve to perfection in the ACC-*ing* form, but are noticeably better than *growth* and *separation*, to my ear.) Assuming this is not just a garden-path effect, we are faced with a situation where true external arguments are licensed, but not accusative case, nor auxiliary stacking. A structural account of the putative three-way contrast between OF-*tion*, OF-*ing,* and *ACC-ing*, then, could go like this: the accusative-case-checking FP appears outside VoiceP (Chomsky's original placement of AgrO, cf. Chomsky (1995)). OF-*tion* nominals are formed below VoiceP, and do not include a true external argument. OF-*ing* nominals are formed on a VoiceP with no FP above it, thus explaining the availability of true external arguments but the absence of accusative case. In the verbal domain, the placement of the verb to the left of accusative objects, then, would mean that verbs move even higher than FP (which is now above VoiceP) – to an Auxiliary or Aspect head. The true ACC-*ing* gerunds, then, would be formed on this uppermost head (see Alexiadou (2005) for an analysis along these lines). Alternatively, the assumption in Fu et al. (2001) that *of* just IS accusative case as it is spelled out in the nominal domain could be adopted (though cf. the discussion below example (9) and footnote 17).

The structure of *nominalization of verbs,* then, must pretty much be what any morphologist would have told you it was. It includes a verbalizer but excludes the VoiceP and FP:[17]

(20)



13.5 Process vs. result nominals

We now have a syntactic analysis of nominalizations which can account for the presence of verbalizing morphology but the absence of other syntactic properties associated with the verb phrase. However, we have not yet addressed one crucial aspect of the nominalization equation, namely, the question of whether nominalizations have the verbal *semantics* that above we have associated with the vP. This is the crucial problem addressed by Borer (2003a) in her discussion of this issue, and the central issue is the process vs. result nominal distinction discovered by Grimshaw (1990).

The central results of Grimshaw's typology of de-verbal nouns are summarized in (21) below (see also the more comprehensive discussion in Alexiadou (this volume)). Process nominals take arguments (21a), accept aspectual modification, modifiers like 'frequent' and 'constant', and aspectual modification,

[17] Recall that *of*-insertion is impossible in typical ECM-small-clause contexts, as in **John's consideration of Bill a fool*, as noted in the text below example (9); yet a small clause is present in the nominalized structure here in (20), in which *of*-insertion is licensed. Assuming that the treatment of *of*-insertion as a dissociated morpheme outlined below (9) is correct, this means that the context for the dissociated-morpheme insertion rule is met in small-clause cases like *nominalization* but not in *consideration . . . a fool.* This could have to do with the clause-union effect of incorporation of the result predicate, or with the fact that a matrix verb like *consider* is itself made up of a √+v+Voice, unlike the 'light' matrix complex of v+Voice in cases like *nominalization* here or in resultative small clauses like *writing up of the paper*, or, an example provided by Andrew McIntyre, *drinking dry of the pub*. Thanks to McIntyre for bringing this important question to my attention.

in the singular, (21b,c,d), and do not allow (count) indefinite forms (21e):[18]

(21) a. The assignment of difficult problems (bothers the students.)

a′. The transformation/#change of the caterpillar (was complete.)

b. The frequent assignment of difficult problems (bothers the students.)

b′. #The frequent problem (bothered the students.)

c. Their performance of the play in only two hours (surprised the critics.)

c′. #Their dance in only two hours (surprised the critics.)

d. Transformation of the caterpillar into a butterfly as rapidly as possible is essential for the survival of the insect.

d′. #The caterpillar's change into a butterfly as rapidly as possible is essential for the survival of the insect.

e. #A complete creolization of a pidgin can often occur in a single generation.

The conclusion drawn from all the above is that de-verbal process nominals are mass nouns. So far, so good. The crucial problem arises when these nominals occur without their internal arguments. In this situation they get what Grimshaw termed a 'result' interpretation (Alexiadou (this volume) further subdivides these into 'simple event' nominals and 'result' nominals). They become count nouns, and stop allowing aspectual modification and *frequent, constant*, etc. In other words, process nominals *have* to take their internal argument, just like their corresponding verbs; when the structure associated with the internal argument goes away, they lose their process reading and acquire a different, 'result' semantics.

[18] Fu et al. (2001) argue that process nominals allow adverbial modification (even though they are *nominals*) and *do-so* replacement, at least contrastively with non-de-verbal event nominals. The judgements are rather iffy (see, for example, the discussion in Ackema & Neeleman (2004: 21–23) and in Newmeyer (to appear); here are the best examples I can come up with:

(i) a. The treatment of the symptoms regularly is important for a good prognosis.

b. #The therapy for the symptoms regularly is important for a good prognosis.

(ii) a. John's removal of the garbage in the morning and Sam's doing so in the afternoon kept the apartment smelling fresh.

b. #Bill's revenge on Joe in the morning didn't take long, but Sam's doing so in the afternoon occupied three or four hours.

(22) a. #The frequent assignment bothers the students.
b. #The performance in an hour surprised the critics.
c. #The creolization in a single generation surprised the linguist.

How can we treat these result interpretations, and their sudden absence of obvious event structure, within the syntacticocentric set of DM assumptions? Borer (2003a), working in a very similar framework, concludes that both syntactic and 'morphological' word formation is possible with these suffixes. Syntactic word formation results in an event nominal with internal syntactic structure, a position for the object, etc.; pre-syntactic word formation produces a syntactically atomic N° which has the interpretation of a result nominal. This type of split approach is not possible within DM; to adopt the notion that words can be built either pre- or post-syntactically would make most of the framework's strongest claims vacuous. Because these result nominals retain their full morphological structure, a DM account has to accept that they are fully as internally complex as their event nominal counterparts.[19] The complex morphology also tells us that, even on the result reading, these nominals must contain all that they need to denote complex events – the v° and its complements (minus any arguments). We are forced to the position that some other factor must be interfering with internal-argument licensing in process nominals. Alexiadou (this volume) proposes that internal arguments may be introduced by a separate functional projection, which may be absent from result nominalizations and hence eliminate the internal argument in the same way that the absence of the Voice head from *of*-nominalizations eliminates the external argument. Below, I outline another possibility, drawing on the fact that result nominalizations, unlike event nominals, are count nouns.

We know that coercion from a mass to a count interpretation is independently possible in English (*two coffees, those wines, many rains*) – and that different kinds of mass nouns result in different kinds of count interpretations under coercion (*two* (CUPS OF) *coffees, those* (KINDS OF) *wines, many* (SEASONS OF) *rains*). Mass process nominals, when coerced to count nominals (perhaps by a higher, null, 'packaging' head such as Num or Cl), tend to give a result interpretation. The idea that I wish to suggest here is that, in undergoing the coercion from a mass, process-denoting nominal to a count, result-denoting nominal, a semantic side-effect kicks in which rules out the presence of the syntactic object (again, see Alexiadou (this volume) for additional discussion of the relevance of the mass/count transition to the structure of these nominals).

[19] Note that some languages *do* show major morphological differences between event and result nominals; see, for example, Engelhardt (2000) on Hebrew.

In the structure for the vP proposed above, the object (or resultative small clause containing the object) measures out the duration of the event denoted by the vP, via a Krifka-style Event-Object (or Event-Path) homomorphism. The semantic role of the object in the structure, then, is to provide a boundary for the unfolding of the event.

The role of the count-noun-creating head in coercion of mass nouns to count interpretations (the 'Packager', in Jackendoff's terms, cf. Jackendoff (1991)), is similar. The packaging head imposes a boundary on the mass noun, making it discrete and countable – quantizing it, in Borer's terms, cf. Borer (2005a). I suggest that the presence of a syntactic object is incompatible with the coercion of a process nominal to a count noun because the delimitation imposed by the packager is incompatible with the delimitation imposed by the object (though see Alexiadou (this volume) for a precisely opposing view). In *the nominalization of the two verbs*, the extent of the verbs (two of them) determines the extent of the nominalization event. It goes on until both verbs have been nominalized. When the noun is coerced to a count reading (e.g. *a nominalization (#of two verbs)*), the packager specifies the boundaries of the new meaning, and the object may not play its delimiting role. Hence, if the object is present in the structure, the conflicting interpretations imposed by the two delimiters results in ill-formedness.[20]

It is worth noting that this effect is not confined to verbs with overt nominalizing morphology. Below are presented some simplex (Ø-derived) mass-event Ns which take an argument and which in my judgement accept modification with 'frequent'. I've included for each a 'frequent'-modified occurrence in the wild, courtesy of Google. I've looked at approximately 250 event-denoting nouns, both simplex and derived, that fit in one of Vendler's 'narrow containers', but have not found any mass-event-denoting, argument-taking nouns that accept 'frequent' modification which do not have a related verb. This is consistent with the observation of Zucchi's (as attributed by Grimshaw and cited in Borer (2003a: 47) that no AS nominals exist which are not formed from a verb.

[20] Andrew McIntyre (p.c.) notes that this account of the infelicity of the object in result interpretations does not explain why the result interpretation allows object-drop, given that process nominalizations enforce the selectional requirements of the verb, and are incompatible with object-drop. If all the structure of the process nominalization is present in the result nominalization, as claimed here, then the same violation should occur if the object is dropped in the result nominalization. I offer two speculations concerning this point. First, it might be the case that the packager head that produces the result interpretation actually checks semantic quantizing features on the verb, and that it is those features which enforce the object requirement in the process interpretation, which, being a mass noun, has no packager head to check those features. Alternatively, it could be the case that, although an overt object is incompatible with the packager's quantizing effect, an implicit null object with non-specific reference (perhaps PRO) is not, and that such a null argument may satisfy the subcategorization requirements of the verb in the result interpretation.

(23) the frequent rape of women in Darfur (My example)
However, each side did allege **frequent rape of** its women civilians by the other's soldiers. (Google, http://www.asil.org/ilib/ilib0708.htm)

(24) the frequent collapse of the king (My example)
Various manifestations of these phenomena have long been known to industry and agriculture, including the **frequent collapse of** grain silos, the jamming of hoppers or other equipment.
(Google, http://weboflife.nasa.gov/regolith_announce.htm)

(25) the frequent repair of the motorcycle (My example)
Repeated failure to take care of the instrument in this manner will necessitate **frequent repair of** the fluidic system, with resultant instrument downtime.
(Google, http://home.ncifcrf.gov/ccr/flowcore/schedcal.htm)

(26) the frequent censure of journalists (My example)
It is already the case that, because the enforcement of current regulations requires **frequent censure of** personnel performing special fluoroscopic procedures, many personnel do not comply with existing requirements.
(Google, www.crcpd.org/SSRCRs/d-rat03.pdf)

(27) the frequent murder of journalists
[contra Borer 2002: 22 as cited by Alexiadou[21]]
. . . as evidenced by widespread poverty and **frequent murder of** judicial and governmental officials.
(Google, http://ftp.fas.org/irp/congress/1998_hr/h980610-riutta.htm)

(28) the frequent capture of illegal immigrants (My example)
. . . especially to the marine prisoners, whose numbers were rapidly increasing, owing to the **frequent capture of** American privateers by the king's cruisers.
(Google, http://www.lewrockwell.com/orig/north5.html)

(29) the frequent defeat of the Korean forces . . . (My example)
. . . 'hard-core' partisans . . . are becoming an increasingly larger proportion of those voting, which contributes to the more **frequent defeat of** moderate candidates.
(Google, http://annezook.com/archives/000940.php)

[21] Google returns approx 473 hits for 'frequent murder of', vs. 451 for 'frequent murders' (without *of*).

(30) the frequent practice of good brushing habits (My example)
The frequent practice of this discipline will enable you to understand and know yourself better inside and out.
(Google, http://yoga.org.nz/benefits/benefits_personal.htm)

(31) the frequent outbreak of disease in refugee camps (My example)
The **frequent outbreak of violence** in Lower Assam is a reminder that . . .
(Google, http://frontlineonnet.com/fl1520/15201370.htm)

(32) frequent meltdown of the reactor (My example)
. . . the violence of simulated 'true shows', or the **frequent meltdown of** sanity and basic civility on talk shows . . .
(Google, http://people.bu.edu/pstring/4.html)

These nouns, too, when they are coerced count nouns, lose their internal arguments, or at least become considerably more infelicitous with them:

(33) a. a rape (??of a woman)
b. a collapse (??of a table)
c. a repair (??of a motorcycle)
d. ??a censure (?? of a journalist)
e. a murder (??of a journalist)
f. a capture (??of a prisoner)
g. an outbreak of disease
h. a meltdown (??of a reactor)

If these nouns are just regular complex event nominalizations with a null nominalizer, they can't tell us anything different than argument-taking nouns like *destruction of the city* can. Testing them with temporal modifiers is somewhat inconclusive ('The capture of the prisoner in only three hours' seems fine, but '??The repair of the motorcycle in only three hours' is quite odd to my ear, for example).[22] If they *are* genuine examples of structurally simplex

[22] On the other hand, the fact that the only cases of such simplex nouns all have related verbs suggests that they are likely to be de-verbal in the relevant way, i.e. they are complex nominals with null nominalizing morphology, as noted by Hagit Borer (p.c.). Alexiadou (this volume) lends weight to this hypothesis with the observation that all these nominals share another characteristic, namely, they all form part of the borrowed Romance vocabulary.

Andrew Mcintyre (p.c.) notes an interesting definiteness effect when eventive *of*-nominalizations are compared to their synthetic compound counterparts. The *of*-nominalization prefers to be definite, while the synthetic compound rejects a definite determiner – the presence of the determiner results in a definite ESL feel to the example:

(i) ?(The) smoking of weed during plenary talks is not allowed at this conference.

event nominals, however, then they can tell us something, namely, that when an argument-taking mass-event nominal without any internal verbal structure is transformed into a count noun, it loses its internal argument. That is, perhaps these nominals suggest that the licensing of *of*-marked argument NPs is blocked by the count-noun-deriving process, rather than by loss of internal verbal structure.

13.6 Conclusions

In a framework in which every piece of morphology must have a structural correlate, morphology can guide our conclusions about syntax and semantics, and vice versa. In order to avoid vacuity, however, morphology must be taken seriously: complex morphological structure cannot just be ignored when it seems to be making odd syntactic and semantic predictions. In this chapter, I have presented nominalizations as a test case of this hypothesis, using syntactic facts to derive conclusions about the morphology (position of nominalizers in the structure), and then using morphological facts to derive conclusions about the syntax (position of verbalizers within nominalizations). Like any strong hypothesis, this one can lead to difficulties when pushed to its logical conclusion; I hope to have at least suggested that the particular difficulty posed by the puzzle of result nominalizations may have a plausible explanation within the bounds of the theory.

(ii) (*The) weed-smoking during plenary talks is not allowed at this conference.

This effect carries over to these simplex event-nominal cases, comparing the *of*-insertion form to an equivalent event-denoting compound:

(iii) ?(the) repair of motorcycles/?(the) meltdown of reactors

(iv) (*the) motorcycle repair/(*the) reactor meltdown
(* on the event interpretation only)

14

The representation of movement in *-ability* nominalizations. Evidence for covert category movement, Edge phenomena, and local LF

THOMAS ROEPER AND ANGELIEK VAN HOUT

14.1 Introduction

Two questions are prominent in modern minimalist discussions: how abstract are the principles which govern grammar, and how far do syntax and the lexicon penetrate one another? We argue that very sharp data reveal the presence of a passive operation for *-ability* nominalizations which (a) entails covert phrasal movement, (b) a 'long-distance' connection to an Edge, (c) LF sensitivity, and (d) the Chain Condition (following Chomsky (2001), Pesetsky (2000), as well as Frampton & Gutman (2000), Fu et al. (2001), Hout & Roeper (1998), Roeper & Hout (1999)). Our argument moves in the same direction as other discussions of CP/DP parallelism (Chomsky (2005), Hirawa (2005), Svenonius (2004)).

Although we couch the discussion in current minimalist terminology, we believe that the argument transparently requires an abstract notion of movement in whatever theory emerges in the future. If such a fundamental notion of movement is involved, then it should cover more ground. We argue in particular that it is a species of covert movement that predicts restrictions on *there*-insertion in nominalizations as well.

The heart of the argument pivots upon the following contrast, to which we shall return, discussed in Hout & Roeper (1998) and Roeper & Hout (1999).

(1) a. the learnability of grammar by children[1]
b. *children's learnability of grammar
c. grammar's learnability by children

(2) a. the heritability of IQ by children
b. *children's heritability of IQ
c. IQ's heritability by children

There seems to be a thematic restriction on the specifier of the DP of *-ability* nominals. What blocks (1b) and (2b) with the agent in the specifier of the DP? Since (1a) and (2a) are possible, the nominalization clearly allows the agent in a PP. Moreover, if something blocks (1b), exactly why does the same constraint not block (1c) with the theme in the specifier of the CP? Classic arguments to the effect that possessives are free in their interpretation would lead precisely to the prediction that they should allow an agent there. Instead we find that a theme can be preposed, but not an agent. This argument realization pattern is precisely the same as the restriction on the subject of a verbal passive. Since *-ability* nominalizations seem to coerce the same thematic restrictions on the DP specifier position as passive does on the TP subject position, we will argue that the specifier position is the long-distance subject of the underlying verb.

The same restriction holds for *-edness* where the passive morpheme *-ed* inside a nominalization is overt.

(3) a. The team excluded John.
b. John was excluded by the team.
c. John's excludedness (by the team)
d. *the team's excludedness of John
e. the excludednesss of John (?by the team)

While (3e) may verge on the infelicitous, (3d) is so ungrammatical that it verges on incomprehensibility. Why can we not reconstruct the notion of agent in the possessive of such a nominalization to equal (3a)?

We argue that passive is imposed by the inner *-able* or *-ed* affix and it prevents the presence of an agent in the DP's subject position. That is, **children's learnability* is excluded for the same reason that we cannot say (4).

(4) *Children are learnable.

[1] Note that the challenge does not lie with the noun *ability*:

(i) the child's ability to learn grammar

In essence, Burzio's constraint (Burzio (1986)) applies inside nominalizations. Burzio's constraint formulates an observation about verbal passives. Case absorption of object case dethematizes the subject position; it effectively removes an agent projection from subject position. Extended to nominalizations, this constraint is apparently able to apply from within the VP (from Spec-VP to Spec-vP) to the specifier of AP (*-able*), to the specifier of NP (*-ity*), to the specifier of the DP (see (8) below). It appears to be a kind of covert 'long-distance' A-movement. How do we formulate a Burzio-type constraint that is sufficiently abstract to capture its presence in both verbal and nominal structures? We argue that modern principles of minimalism are needed, in particular the notion of Edge. Before we address that question, we provide the argument in greater detail.

14.2 Nominalizations and the inner VP

The *-ability* nominalizations in (1) and (2) stand in stark contrast to traditionally discussed *-tion* nominalizations such as (5).

(5) a. the enemy's destruction of the city
    b. the city's destruction by the enemy

Sentences like (5b) have been classically called the passive of a nominalization, while (1)–(2) involve the nominalization (*-ity*) of a passive (*-able*). Whereas *-tion* nominals provide both active (5a) and passive (5b) versions, the morphologically passive *-ability* nominalization in (1)–(2) must always be passive. Evidently the Spec-DP position functions as a 'subject' position and is therefore subject to constraints on subjects. This demonstrates that Spec-DP can be a true argument position, rather than an adjunct position.

A question arises, however: can we have a coherent notion of subject that fits both verbal and nominal forms? The difference between the position of Spec-TP, which dominates a vP in sentences, and Spec-DP which is generated above the NP marker *-ity*, which must in turn dominate AP (*-able*), which in turn dominates vP, is quite large. Burzio's generalization has never been captured in a transparent way for passive, which is why it is a generalization and not a principle. Our data suggests, minimally, that the right explanation has to be more abstract than hitherto thought.

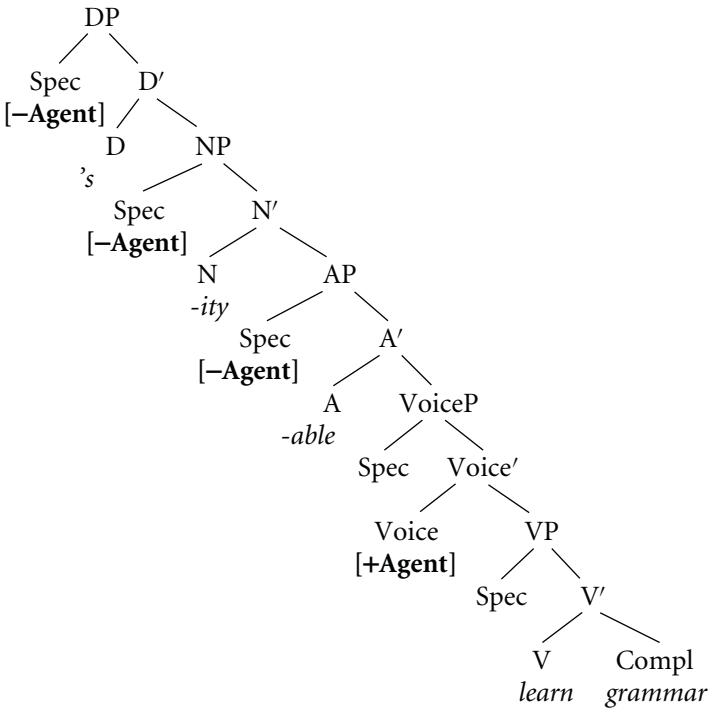
We will now reconstruct the relevant structure and then show where current minimalist concepts meet the explanatory challenge. First, arguments from Fu et al. (2001) show the existence of a VP inside nominalizations. For instance, one can add anaphor *do so*, (6a,b) and adverbs, (6c,d), each of which are a mark of a VP.

(6) a. John's explanation of the facts, and Mary's doing so too
b. *John's version of the facts and Mary's doing so too
c. John's departure to Hawaii quickly
d. *John's trip to Hawaii quickly

These differences are capturable with a structure that involves a nominalizing affix above a VP. Where there are two morphological affixes, *-able* and *-ity*, we then have the specifier properties listed in (7) and the structure in (8), which shows the putative impact of *-able* for a dethematized subject specifier position, marked here as [−Agent] all the way up the tree (using VoiceP from Kratzer (1994); see also Hale & Keyser (2002b) and Chomsky's notion of little v, Chomsky (1995)). The locality of argument projection can be maintained under the assumption that, as the verb moves up and picks up affixes, it carries its [−Agent] argument projection with it.

(7) *learn* Spec = [+Agent]
learn + *-able* Spec = [−Agent]
learnable + *-ity* Spec = [−Agent]

(8)



The goal is to economically capture how the suffix *-able* patterns with verbal passives in excluding subject agents as illustrated in (9).

(9) a. The grammar was learned by children.
b. *The children are learned.
c. The grammar is learnable by children.
d. *The children are learnable.
e. *children's learnability of grammar

In both instances where passive is present, the subject position does not allow the agent. This restriction on the subject position is inherited when *-ity* is added as (9e) shows. Connecting the notion of passive to the notion of morphological inheritance (Randall (1982)) suggests assimilation to the notion of movement.

There is one striking difference between passive *-ed* and *-able*, however: the object must move in the verbal passive, but can remain in a prepositional phrase in the nominal passive; compare (10b) and (10d).

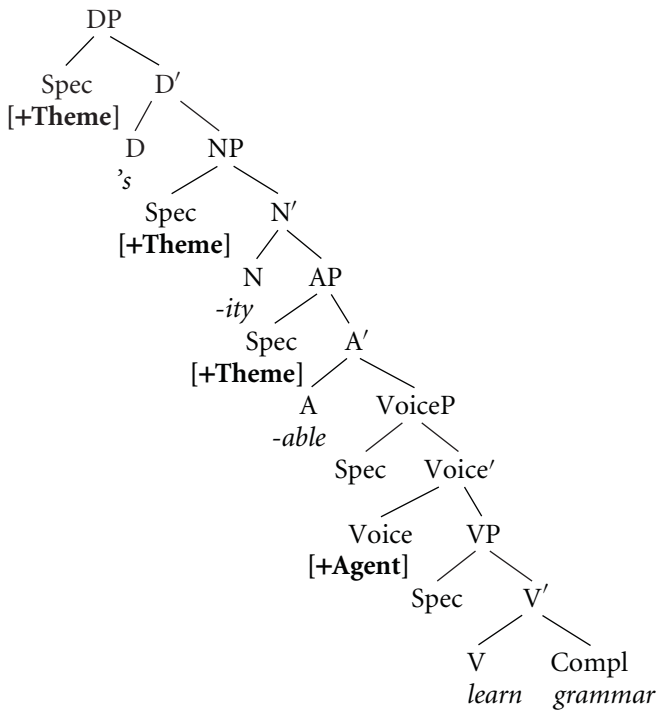
(10) a. The grammar was learned.
b. *It was learned of the grammar.
c. grammar's learnability
d. the learnability of the grammar

If the object can stay in the PP in a nominal passive, as in (9d), why can't the agent appear in the specifier position of the nominal, as in (9e)? Why is the possessor position not free?

We argue that the answer is to maintain a complete parallel between the verbal and nominal passive (see Hirawa (2005) on CP–DP correspondence). We achieve this by postulating covert movement of the object to the specifier position for the PP case in (10d), in effect then blocking this position for any other phrase, and making the nominal and verbal passives transformationally identical. (We discuss technical consequences for case theory below.) In (11) we have notated this covert movement by marking the subsequent specifier positions as [+Theme]:

(11) a. [+Theme]$_i$'s learnablity t_i

b.



Note that, not only is the agent excluded from the uppermost specifier position, but adverbs are excluded too. Here too *-ability* nominals differ from *-tion* and other nominals. Compare *destruction* and *discovery* versus *learnability* and *discoverability* in (12).

(12) a. Last year's destruction of the city was a disaster.

b. The learnability of computer science last year was easier than this year.

c. *Last year's learnability of computer science was easier than this year's.

d. The 19th century's discovery of new genes turned out to be a revolution.

e. The discoverability of new genes in the 19th century turned out to be a revolution.

f. *The 19th century's discoverability of new genes turned out to be a revolution.

Whereas the specifier position in *-tion* nominals is unrestricted – it may host an agent, theme or adverbial – the specifier position of an *-ability* nominal is only available for themes.[2]

Another consequence of assuming passive in the nominal is that we expect to find disjoint reference effects. And indeed we find them, (13).

(13) a. The child was dressed.
b. The child dressed.
c. the dressability of the child

(13c) only has the transitive reading (someone dresses the child), and not the reflexive one (the child dresses). This disjoint reference effect of the passive in *-able* is evident prenominally as well.

(14) a. a loving couple
b. a lovable couple
c. the loveability of the couple
d. the couple's loveability

While (14a) allows a reciprocal reading, the remaining cases all require that the agent be disjoint from the couple. But does the passive require disjoint reference? It is possible to construct a neutral case with a truly adjectival passive, which has essentially lost its argument structure.[3]

(15) John is shaven.

He may have done it himself, or the barber has shaved him. It seems as if you can only get a reflexive reading when the agent c-commands the object, i.e. *John shaves (himself)*. In a passive the object moves higher up and cannot be c-commanded. This then forces a non-reflexive reading and yields a disjoint reference effect, while in (16b) the PRO subject of the *-ing* nominal licenses the reflexive.[4]

(16) a. *The dressability of himself thrilled the little boy.
b. The PRO dressing of himself thrilled the little boy.

We argue that in (16a) *himself* moves covertly, and that is for the same reason that you cannot have a reflexive as subject in a verbal active or passive, (17).

[2] See Roeper (1993) for further discussion.

[3] Failure to see that the adjectival/verbal passive has consequences for disjoint reference has often led to confusion.

[4] First discussed for verbal passives in Postal (1974); see also Baker et al. (1989) and Roeper (1987).

(17) a. *Himself washed John.
b. *Himself was washed by John.

14.3 What moves? Why feature-movement fails

Our proposal of covert movement of the theme argument leads to a current focus in linguistic theory. What needs to be moved? One goal of linguistic theory is to minimize structures and operations. Therefore, we should seek to move as little as possible. The existence of pied-piping in grammar remains a problem, or an imperfection which has been linked to other modules like phonology (Chomsky (1995), Chomsky (2001)).

In principle, then, covert movement should move only what needs to be checked under a feature-checking model. However, Chomsky (2001) and Pesetsky (2000), among others, have argued that more than feature movement may be required. The 'more' is usually referred to as category movement or phrasal movement. We can ask, what is moved to the specifier position in (11)? Is it a feature, part of the object noun phrase (the noun plus determiner) but no adjuncts, or the full phrase (noun, determiner and adjunct)? Under a feature-movement account, one could argue that only a formal feature [+Theme] moves to the specifier position to give it the Theme requirement.[5] This could achieve the blocking effect we desire. Is there evidence that more than a thematic role feature must move?

A *prima facie* argument for covert phrasal movement of the full phrase object is that overt phrasal movement of the full phrase is required. Of course, parallelism is not necessary, but natural under an Occam's razor perspective. We note that, while verbal passives allow extraposition of a PP adjunct belonging to the subject, nominal passives do not. They require a full DP and not just the head without the adjoined PP as we can find in verbal passives, (18).

(18) a. The grammar of Dutch was learned.
b. The grammar was learned of Dutch.
c. *the grammar's learnability of Dutch
d. the grammar of Dutch's learnability

We find that (18c) is not allowed. Therefore, if covert movement is minimally different from overt movement, then we should assume pied-piping of the full

[5] See Hornstein (1999) for an argument that agent should be treated as a feature in implicit agent constructions.

phrase. However, it would be ideal to show that there is a meaning difference in covert movement which requires movement of the whole phrase.

14.3.1 *Quantifier movement: wide scope inside the nominalization*

Pesetsky (2000) has argued from cases of antecedent contained deletion that we must have covert phrasal movement, by showing interpretive differences that cannot be predicted by moving only a feature. In that spirit, we can also show a meaning difference at a subtle level that applies to the covertly moved object which is overtly in a postnominal PP. Consider the contrast between (19a,b). Kayne (1981) notes that (19b) does not retain the meaning of (19a).

(19) a. The election of nobody surprised me.

b. Nobody's election surprised me.[6]

In (19a) we get a group reading or a distributed reading, while in (19b) there is only a distributed reading. That is, with the postnominal object in (19a) we can have an empty set (no person got elected and that fact surprised me), while with the object in the specifier position in (19b) we have a full set of elected people, each of whose election did not surprise me. (19a) also has this distributed reading. Similar ambiguities arise elsewhere, as in (20).

(20) a. A picture of everyone is here.

b. Everyone's picture is here.

In (20a) there is a group reading and a distributed reading, while in (20b) we have a distributed reading only. In other words, a specific wide-scope reading arises with preposing.

This fact merits emphasis in itself. If we assume that LF movement is uniformly to the beginning of the clause, then it suggests that LF differences exist at the DP level, supporting the view that the DP is clausal in nature. This in turn supports the view that it should be regarded as a phase in terms of Chomsky (2000), Chomsky (2001), Chomsky (2004). We call this phenomenon local LF. We argue below that it can be assimilated to the class of Edge phenomena (leaving its possibly substantial further implications unaddressed here).

Now we are in a position to construe an important test. What happens to the local LF effect in *-ability* nominalizations? We predict that, if covert

[6] A context makes the contrast clearer:

(i) Many people were surprised that a black and a Hispanic were elected in largely white neighbourhoods. But actually, nobody's election surprised me.

movement is obligatory, then only the distributed, wide-scope reading should be available. This is just what we find when we look closely at (21).

(21) a. The believing of every witness was a surprise.

b. The believability of every witness was a surprise.

c. Every witness's believability was a surprise.

In (21a) we have the group reading with narrow scope of *every witness*: it was a surprise that the set of witnesses was believed; while in (21b) we have a distributed reading with wide scope of *every witness*: it is the believability of each witness that is a surprise. This is precisely the reading we find for (21c) in which the object has moved overtly. Consider also (22).

(22) a. The election of nobody surprised me.

b. The electing of nobody surprised me.

c. The electability of nobody surprised me.

d. Nobody's electability surprised me.

Compare (22a,b) and (22c,d). (22a) is ambiguous between a group and a distributed reading, and in (22b) the group reading appears to be required or strongly preferred: nobody was elected. (22c) in contrast only has a distributed reading with wide scope of *nobody*: as for the set of electable people, none of them were surprising. The other meaning (that there is a possibility that nobody was electable) is excluded. In other words, we are projecting a wide-scope reading for the quantifier *nobody* even when it is in a postnominal PP. Such a wide-scope reading is exactly what we predict under covert phrasal movement: more than a thematic role, in fact the whole phrase, now including scope features, moves. Again, overt preposing in (22d) has exactly the same reading.

The negative quantifier *nobody* is known to confuse some of these judgements, so it is wise to avoid it. Therefore, we add another case, (23).

(23) a. The selection of just one girl came as a surprise.

b. The selectability of just one girl came as a surprise.

c. Just one girl's selectability came as a surprise.

There is ambiguity in (23a): the fact that just one girl was selected was surprising, or as for all the selected girls, just one of them was surprising. (23b,c) on the other hand only have the latter reading. These preferences, though subtle, are amenable to a precise technical representation if we take another look at verbal passives. The wide/narrow scope contrast arises in just these contexts, as has been observed for a long time.

(24) a. Everyone speaks two languages.
b. Two languages are spoken by everyone.
c. Two languages must be spoken by every applicant for foreign language teacher.

(24b) favours wide scope. But the narrow-scope reading remains possible, particularly if a favourable context is chosen as in (24c). Here we can pull out the other reading: two languages, but an unspecified two languages, must be spoken.

However our claim in this chapter is that the *-able* affix creates a preference for wide-scope readings that resembles the sentential passive preference but in fact is stronger and no longer has an ambiguity.

Some speakers, very marginally, allow the narrow-scope reading of (23b) as well. How can this arise? We feel that a further operation of reconstruction occurs, which allows the faint presence of this interpretation. The same, strongly felt interpretation is available for (23c) because it mirrors the surface and requires no further operation. This is illustrated in schematic terms in (25).

(25) a. For (25b): *the selectability of just one girl*
1. Move covertly: <==========[just one girl]
[just one girl's] selectability
2. Reconstruct: [just one girl's] ==========>
the selectability of [just one girl]
= narrow-scope interpretation of object
b. For (23a): *the selection of just one girl*
Direct interpretation: select [just one girl]
= narrow-scope interpretation of object

The *-tion* case (23a) allows object movement, but does not require it. However, when the passive *-able* morpheme is present in (23b), covert object movement is obligatory. Thus, at a very subtle, but discernible level we see the presence of covert movement and a distinction with reconstruction.

14.3.2 *Adjectival choice: willing participants*

If our claim of covert movement is correct, then it should have indirect consequences as well. Indirect consequences are generally the most persuasive form of linguistic evidence because they presuppose the claim being made. Tom Ernst (p.c.) has pointed out to us that adjectives select subjects. Thus, the willing participants change in (26), depending on what is in the subject position;

in (26a) it is the patient and in (26b) it is the doctor. However, ambiguity arises when both nouns are postpositional; in (26c) the patient or doctor is willing.

(26) a. the patient's willing examination by the doctor

b. the doctor's willing examination of the patient

c. the willing examination of the patient by the doctor

Now we are in a position to test our hypothesis that covert movement exists, because it should force the object reading in *-ability* nominals:

(27) the willing examinability of the patient by the doctor

While the noun phrase itself seems questionable, the patient seems to be the one who is willing, not the doctor. We explored this claim with a small experiment (which could be expanded) by asking 16 undergraduates to finish one of the four sentences in (28) (four participants for each sentence):

(28) The insurance company policy made everyone nervous.

a. The doctor's willing examination of the patient came as a surprise.
He did it because . . .

b. The patient's willing examination by the doctor came as a surprise.
He did it because . . .

c. The willing examination of the patient by the doctor came as a surprise.
He did it because . . .

d. The willing examinability of the patient by the doctor came as a surprise.
He did it because . . .

The sentence completion always revealed who the subject of *willing* was, for example, 'he knew he was really sick' and 'he felt a doctor's obligation'. The answers (with one exception) fell exactly into line with our prediction, as the results in (29) show.

(29) a. doctor / patient
0 4

b. doctor / patient,
4 0

c. patient / doctor
2 2

d. doctor / patient
1 3

For (28a) and (28b) participants chose the overt subject; for the ambiguous (28c) there was an even split; and the covert movement case in (28d) was 3/1 in favour of the prediction under the assumption the object moves covertly. Thus, we find indirect evidence that supports our account.

14.3.3 *Further covert movement in nominalizations*

If covert movement occurs with these objects, then it should occur in classic covert movement environments as well: *there*-insertion. It has long been argued that sentences like (30) involve covert movement of the object *three boys* to subject position in order to justify subject–verb agreement.

(30) There are three boys.

We predict that the same movement occurs in nominalizations, but with the consequence that *there* does not appear because there is no case requirement to satisfy.

(31) a. the appearance of Bill
b. Bill's appearance
c. *there's appearance of Bill

Since in (31a) covert movement occurs, there is no justification for *there*-insertion. In fact, *there*-insertion cannot occur, as (31c) shows. The occurrence of *there* in the sentential syntax is, as claimed, reduced to the need for case assignment.

Raising from ECM constructions, rather than inserting an expletive to carry case, means that the *there* is raised in just the way that a normal NP would be raised, (32).

(32) a. Bill's appearing [t to be a problem]
b. there's appearing [t to be a problem]

It seems, moreover, that here the raising is obligatorily overt or preferentially overt in both cases; compare (32) with (33).

(33) a. ?the appearing of Bill to be a problem
b. ?the appearing of there to be a problem

This is unlike the covert raising in (31a) where (31c) is totally excluded. It is excluded because covert raising of *Bill* means that there is no case reason to raise it. In (32b) on the other hand *there* is actually the subject of the

lower clause, and therefore is overtly or covertly raised just like *Bill* in (32a). Therefore, (33) is (partly) grammatical because it is a moved expletive, not an expletive inserted to capture case. Our analysis receives just the sort of additional support that one would predict.[7]

14.4 Phrasal movement and greater abstraction: Edge, long-distance Agree, cycle within morphology

What exactly gets moved? Whatever is moved, it appears to involve more than just a feature for a thematic role. In fact, it is not clear what it would mean to move only the thematic role feature [+Theme]. It would have the desired function of blocking an agent in the specifier position.[8] However, if it were just a feature, then it would presumably not have whatever greater structure is entailed by a quantifier. Feature movement of [+Theme] makes no predictions about the interpretation of a quantificational object. What then could carry that information? One could assume a pure quantifier node (QP, as in Beck (1996)) or the traditional assumption that definite reference (wide scope) requires a DP to carry the specificity property. In any case, there must be movement of at least the DP and more than just a thematic feature to entail this meaning.

To summarize, at this point, the interface between modules often puts both principles and problems into sharp relief. It is perhaps useful to assemble now the challenging characteristics about morphological passive in nominalizations, (34).

[7] The higher tree connection of *-ing* nominalizations allows a much wider range of argument projections. In fact, in that environment, we find that *there*-insertion is necessary again, when a VP is present, (ia), since it is ungrammatical without it, (ib,c).

(i) a. There's being a problem surprised everyone.
b. *The being a problem surprised everyone.
c. *The being of a problem surprised everyone.

Here there seems to be the typical instance of an EPP requirement which is carried into nominalizations which have IP structure. See Hout & Roeper (1998) where it is argued that nominalization can occur with separable properties at every level from V to IP.

[8] Note that while thematic roles must eventually attach to a complement, the complement could be just a bare N. The theme role is in fact absorbed by the incorporated N in a compound like *truck-driving*, such that one cannot say (i), even though the meaning is plausible, because it would involve two uses of the theme argument.

(i) *truck-driving of Fords

(34) a. Subject position: the EPP position is not within any obvious next Phase, but rather at the Edge of a higher DP.

b. Case-absorption: *-ability* passives allow *of*-PPs and therefore no absorption occurs.

c. Scope: wide scope is obligatory for the complement (*electability of nobody*).

These properties intuitively call for greater abstraction if they are to be captured within the spirit of current principles. Chomsky (2004) goes in precisely this direction.

Chomsky proposes that a modernized notion of the cycle applies more locally and provides arguments that movement operations, semantic interpretation, and phonology occur at the Phase level, via an operation of Transfer, which 'hands over' information after syntactic rules apply to these additional components of grammar. Thus, all components of grammar apply in each cycle, but no further ones, following the Phase Impenetrability Constraint. One traditional, but now more abstract exception exists for the 'Edge' (in the tradition of the CP escape hatch). A Phase thus is a hypothesis that the old notions of clause and movement to Spec-CP are insufficient. There is a tradition of suggestions that nominalizations are clause-like. The notion of Phase is an explicit elaboration which can now subsume the clause, the DP, and the VP, at least. Then Chomsky proposes the following, (35).

(35) a. The domain of H is not accessible to operations, but only the Edge of HP.

b. Phases include vP and VP and might include DP.

The Burzio constraint we found inside the DP may be the most concrete illustration of the legitimacy of these more abstract concepts. Our evidence suggests precisely that movement is to the Edge of DP, which then must be a Phase. Evidence of this kind supports the notion that the abstract notion of Edge, rather than just Spec-CP, is needed. It is a natural prediction that Phases should also form an LF domain and therefore DP should be an LF domain.

What follows are exploratory remarks on how we may adapt certain of these concepts, in particular the notions of Phase, Edge, and covert movement of a phrasal argument. We add wide scope within DP. We can restate the above as follows.

(36) a. DP operates as a Phase.

b. Movement goes to the Edge of DP.

c. Covert movement for objects of morphological passive is obligatory.

d. Movement to satisfy both thematic and quantifier scope requirements can occur.

We use these concepts for constructions that are quite different from those utilized by Chomsky, but which are predictable under the view that abstract principles should unite disparate facts. If they apply, then they appear to be a significant factor to buttress the level of abstraction chosen.

Chomsky comments specifically on direct objects within the verbal system, noting their ineligibility for covert movement.

> Covert movement to the escape hatch Spec-vP is possible for a direct object only if it undergoes further A′-bar movement (in the informal sense). Thus there is covert wh-movement but not covert object shift OS (yielding the semantic edge properties but without overt movement). If OS is case-driven, and Move includes Agree, then we cannot have the sequence of operations: Agree (v, object), Transfer, OS. But wh-movement is plainly driven by a different feature, as successive-cyclic and adjunct movement make clear. Therefore it can apply (covertly) in a unitary fashion after Transfer.
>
> Chomsky (2004: 116)

This analysis in fact makes a prediction: if case is assigned in a different way, and if long-distance movement is involved, then the theory predicts that it should be possible to move an object covertly. The morphological passive appears to be a candidate to fill this predicted niche. First, we have seen that under the definition that Spec-DP is the Edge of a Phase, it is an appropriate landing site. If we assume that Spec-vP and Spec-*ity* are each Phases, then the cyclic movement operation becomes in effect a long-distance operation. And, once again, if the quantificational properties of *nobody* carry extra structure, covert movement is in effect phrasal, as Pesetsky (2000) argues.

Now we must make a further assumption that correlates with the fact that *-ability* nominals take a PP (*the learnability of a grammar*). Case assignment in a PP is different from VP case assignment. The presence of a PP object marked by a preposition, not by the verb itself, then stands out as a hook on which one can explain why covert object movement is possible in the nominalization, but not elsewhere. We will not explore the matter further, but simply say that

under these assumptions we have isolated an instance of covert movement for direct objects.[9]

In support of this approach to passive, Frampton & Gutman (2000) argue specifically that passive should be defined not by case-theoretic constraints but simply by the Chain Condition in (37), which allows the pronunciation of an element in a chain at only one position (a TE head is a Temporal/Event head).

(37) Chain Condition:
A chain is the set of heads sharing a particular feature. Interpretable nominal chains contain at most one TE head.
(Frampton & Gutman (2000))

This then leads to the correct assumption that one cannot have (38a) where *nobody* and *him* are coreferent, with *him* as a resumptive pronoun, just as resumptive pronouns are ruled out in a passive, (38b).

(38) a. *nobody's$_i$ electability of him$_i$

b. *The ball$_i$ was hit it$_i$.

The Chain Condition suits the morphological passive more appropriately than the verbal passive. The Frampton and Gutman approach to the passive under the Chain Condition creates the possibility to include the morphological passive as one instance of a more abstract passive.

Let us then assume precisely that *-able* operates on the argument structure of the verb that it attaches to in the following way.

(39) *-able*: Project theme DP argument;
Move theme DP to Edge of *-able.*

-ity: Select theme projection and Agree features;
Move theme to Edge of *-ity.*

It then waits for Internal Merge to add both *-ity* and DP and then links its theme object features by long-distance Agree cyclically to those positions. This is obviously a rough formulation of ideas which themselves can be specified more exactly. However, we think they will serve to provide a basic design of the passive and how morphological passives contribute to an articulation of minimalist theory.

Our structures have abstracted away from many questions about the presence or absence of TP and aspectual information inside of nominalizations

[9] Suppose one argued that the PP makes the object into a kind of adjunct, and adjunct movement was involved. Still, it would be covert adjunct movement. This seems like a possible technical option, but an inferior conceptual option. It would undo the connection to the passive through the *-able* affix which predicts many other facts (**children are singable*).

(see Alexiadou (2001), Borer (2003a), among others). We will not explore these factors, which may complicate the technical account, beyond the observation that they must be compatible with the movement operations we have demonstrated.

14.5 Nominalization typology and the subject of nominalizations

Our theory depends upon a claim that extends to all affixation: affixes determine argument structure (see also Alexiadou (2001), Borer (2003a), Harley (1999), Harley & Noyer (2000b), Roeper (2000), Roeper (2005)). Once we adopt this view other facts fall into place. A classic question (Kayne (1981)) has been why it is not possible to prepose in *-ing* nominalizations, (40).

(40) a. the destroying of the city

b. *the city's destroying

It seemed like a strange anomaly. However, we can now argue that there is no passivizing affix that would motivate movement to the subject position. If true, we should find other cases. In fact, bare nominals allow only subject readings, (41), *-th* famously disallows a transitive reading, (42), and many affixes allow no argument structure at all, (43).

(41) my love, my help, my advice, my push

(42) the growth of tomatoes

(43) *imaginary of a problem

Although the lexicon is the home of exceptions, there are remarkably few exceptions to these observations. We leave a more thorough discussion of nominalization affixes to future research, but the conclusion is clear: preposing in all derived forms requires exactly the same kind of licensing that one finds in verbal syntax.

An interesting, lingering controversy over subjects in nominalizations has been present for many years. We have argued not only does this chapter provide strong evidence for the subject position but architectural arguments from Hirawa (2005) and Kamiya (2008) (also Hout et al. (2008)) make the assumption of a subject position a natural one. We argue that two factors – the association of subject position with case, and the over-reliance on marginal data–have led in the past to incorrect arguments here.

Initially, Chomsky (1970) and Wasow & Roeper (1972) argued that nominalizations divided into nominal and verbal types, with the nominal types lacking a subject. Roeper (1987) and Chomsky (1986) argued on the basis of the

contrast between (44a) and (44b) that a PRO was present in a hidden fashion within the nominalization which allowed control of the following infinitive.

(44) a. the city's destruction to prove a point

b. the destruction of the city to prove a point

A great deal of subsequent evidence supported the claim, leading finally to the claims in this chapter that hidden passives also target an abstract subject position with features that require covert object movement. Arguments by Lasnik (1988) and Williams (1994) to the effect that it is the entire nominalization which serves as subject of (44a) are unable to account for cases like (45).

(45) the taking of drugs to go to sleep

And the claim that they are purely result nominals is contradicted by many examples in Harley (this volume).

Some of this evidence – though not our arguments from the passive – have been addressed by Harley (this volume) and Alexiadou (2001), Alexiadou (this volume). The issues lie in where the agent comes from in nominalizations and how the case assignment for subjects is achieved. The argument of this chapter is that the notion of subject is not dependent upon case assignment and therefore one can have, in Burzio's terms, a dethematization of the subject position without having the object move for case reasons. It moves for reasons connected to the discourse-semantic effects of passivization. Thus, as we claim, a more abstract notion of subject is needed which provides a landing site for the covert movement we have given evidence for.

The second claim must confront a much wider range of data which, in fact, points to many inadequately accounted for restrictions that appear to follow from the lexicon, as Bierwisch (this volume) argues. The fact that we do not have (46) can be accounted for with the claim we have made here and elsewhere that every affix has a particular argument structure: *-th* takes inchoatives, just as *-ing* must take actives (**the city's destroying*), and *-ability* and *-edness* must take passives.

(46) *John's growth of tomatoes

However, even for *-th* there are many other fairly idiosyncratic restrictions (which may yet yield to analysis). Why do we not have the examples in (47)?

(47) a. *the ball's rollth to the end of the room.

b. *the bridge's fallth

c. *Bill's jumpth

The existence of bare nouns does not always preclude other affixes (*the dead/the death*, *heal/health*). And claims that abstract subjects are not acceptable seem questionable sometimes, (48a). In fact, (48b) is a case where an agent seems to be worse.

(48) a. The policy's causation of numerous problems has to be acknowledged.

b. *John's causation of numerous problems has to be acknowledged.

In addition, as is acknowledged in a footnote in Harley (this volume), there are not some but in fact many embarrassing cases. Google returns plenty of examples like (49) which are supposedly unacceptable under Harley's account.[10]

(49) 'my singing of spiritual songs', 'my singing of scientific songs'

Thus, we conclude that the presence of subjects in nominalizations helps articulate the level of abstraction needed in grammar.

14.6 Conclusion

In sum, we have shown that an economical account of nominalizations leads to the projection of covert movement of the object to the specifier of the nominal for *-ability* nominalizations that parallels Burzio's generalization about verbal passives. Our exploration of what moves in covert movement has led us to assert that feature movement is inadequate. More structure must be covertly moved to capture the behaviour of quantifiers. This could correspond to movement of just the head noun of the object, or the whole noun phrase. We found, further, that some evidence for phrasal movement was available under the assumption of parallelism between overt and covert movement since phrasal movement is required in the nominalization (**the grammar's learnability of Dutch*), whereas it is not required in the verbal form

[10] Harley (this volume) also asks the interesting question of exactly how *of*-insertion works. We do not know exactly what the right approach should be, but we suspect that an important semantic distinction is involved that lies at the heart of the matter. Note that the following two expressions do not mean the same thing:

(i) a. The Mongolian idiot's singing songs surprised people.

b. The Mongolian idiot's singing of songs bothered people.

(ia) refers to the fact that the Mongolian idiot sang at all, while (ib) refers to the manner in which the songs were sung. Thus, it is likely that there is a PP phase involved allowing a separate interpretation. We will not explore the matter further here.

(*the grammar was learned of Dutch*). These facts are parsimoniously captured under the assumption of covert phrasal movement.

In Lees (1960) derivational morphology in the realm of nominalizations was first considered a part of syntax. Roeper & Siegel (1978) extended this view to compounds. Recent work in derivational morphology (Halle & Marantz (1993), Marantz (1997), Harley (1999), and most recently Fu et al. (2001)) has broadened the scope of this enterprise. This essay suggests that a further array of subtle empirical findings is predicted that involve LF. And, moreover, it calls for a higher level of abstraction than required by verbal syntax alone, which in turn justifies the more abstract character of Edge and Phase.

Overall, we have championed the parallelism of DP and CP and a fully parallel theory of semantic and syntactic effects within Phases. Our account of how *-ability* licenses argument projection in DP provides a basis for argument projection with all derivational affixes. Once again we have seen that 'lexical' operations belong in the heart of syntax.

15

Nominal voices*

TAL SILONI AND OMER PREMINGER

15.1 Introduction

The distribution of event nominals in the various voices (e.g. reflexive, reciprocal, unaccusative, passive) has received very little attention in the literature. This chapter reveals the considerable cross-linguistic variation that event nominals show in this respect. We argue that much of the variation follows from the component of grammar in which the operations implicated in the derivation of the specific nominal take place. Some operations are subject to the Lexicon-Syntax Parameter (Reinhart & Siloni (2005)), which determines their locus of application (lexicon or syntax); some are universally post-lexical; others ought to apply in the lexicon cross-linguistically.

Recent years witnessed a sharp reduction in the derivational (operational) role of the lexicon. Increasingly, what used to be construed as lexical operations of valence or category change were attributed to the syntactic derivation. This development culminated in current theories proposing the elimination of the lexicon as an active component altogether, and instead advancing an architecture of grammar that replaces it with non-computational lists of items (Marantz (1997), Marantz (2000), Marantz (2001a), Borer (2005a)). Such 'single generative engine' hypotheses are currently being pursued along various paths, for example, by Alexiadou (this volume) and Harley (this volume), among others.

The significant empirical coverage of our account casts serious doubt on the validity of such approaches, providing support for the view of the lexicon as an active component of the grammar (Siloni (2002)). We do not see a natural way to account for data to be presented here in a theory that bans computation in the lexicon.

* This research was supported by the Israel Science Foundation (grant No. 44/05).

15.2 The cross-linguistic distribution of nominal voices

As will be shown in the following sub-sections, languages exhibit robust variation with respect to the various voices (e.g. reflexive, reciprocal, unaccusative, passive) available for the formation of event nominals. This stands in stark contrast with the inventory available for their verbal counterparts, which in the current sample is more uniform across languages. We will start by examining the facts – namely the availability or unavailability of each voice for the formation of event nominals in a given language.

15.2.1 *Reflexives and reciprocals*

Reflexive and reciprocal event nouns are possible in certain languages (e.g. Hebrew, Hungarian, and Russian; (1)–(3):[1]

(1) a. hitnaškut bney ha-'esre (Hebrew)
kissing.RECIP son.PL the-teens
'the mutual kissing of the teenagers'

b. hitraxcut-am
washing.REFL-them.GEN
'their self-washing'

(2) a. a gyerekek csókol-óz-ás-a (Hungarian)
the children kiss-RECIP-NOMINAL-AGR
'the children's mutual kissing'

b. (a) János (rendszeres) borotvál-koz-ás-a
(the) János (regular) shave-REFL-NOMINAL-AGR
'János' (regular) self-shaving'

(3) a. obnimanie detej (Russian)
hugging children.GEN
'the children's (mutual) hugging'

b. perešjoptyvanie detej
whispering.REFL children.GEN
'the children's mutual whispering'

c. umyvanie rebjonka
washing boy.GEN
'the boy's (self-)washing'

[1] Notational abbreviations: AGR – agreement; DECAUS – decausative morphology; GEN – genitive Case; NEG – negation; NOMINAL – nominalization; PASV – passive morphology; PL – plural; PRT – particle; RECIP – reciprocal morphology; REFL – reflexive morphology; SE – valence reduction morphology; UNACC – unaccusative morphology.

Interestingly, other languages (e.g. Romance, illustrated here with French examples, and Serbian) lack reflexive and reciprocal event nominals, despite the availability of these voices for verbs in these languages, as illustrated below (in French and Serbian, reflexive and reciprocal verbs are formed by the addition of the clitic *se*):

(4) a. Jean s'entend. (French)
Jean SE-hears
'Jean hears himself.'

b. Ils s'embrassent.
they SE-kiss
'They kiss each other.'

(5) a. On se cuje. (Serbian)
he SE hears
'He hears himself.'

b. Oni se ljube.
they SE kiss
'They kiss each other.'

Hebrew and Hungarian mark reflexive and reciprocal nominals using the same morphology used for the corresponding verbs (namely the relevant template or suffix, respectively). This morphology is typical of valence-reducing operations in these languages in general; for example, the same morphology is found with unaccusatives:

(6) hitgalgelut ha-kadur (be-morad ha-giv'a)
rolling.UNACC the-ball (in-slope the-hill)
'The rolling of the ball (down the hill)'

Conceivably, one could conjecture that the absence of reflexive and reciprocal nominals in French, for example, is a result of the incompatibility of the valence-reduction morpheme (*se*) with the nominal category. However, note that in Russian the relevant valence-reduction morphology (the suffix *-sja*) is also incompatible with nouns. Crucially, this does not block the appearance of reflexive and reciprocal nominals (3a–c). This simply renders many nominal forms ambiguous between the active (transitive) and reciprocal (3a) or reflexive (3c) reading. Some reciprocal nouns are disambiguated using the prefix *pere-* (3b), which appears on many reciprocal verbs, but is neither a necessary nor sufficient condition for reciprocity in Russian.

It therefore seems that morphological compatibility of a valence-related morpheme cannot simply be the reason for the absence of certain voices in

the nominal paradigm. This view is further supported in light of the cross-linguistically invariant existence of unaccusative and subject-Experiencer nominals, including in French (see §15.2.2).

15.2.2 *Unaccusatives and subject-Experiencers*

Unlike reflexive and reciprocal nominals (§15.2.1), unaccusative and subject-Experiencer nominals are possible in all languages in the current sample:

(7) a. hitkavcut ha-mixnasayim ba-kvisa (Hebrew)
shrinking the-pants in.the-washing
'the pants' shrinking in the washing'

b. hit'anyenut-o ba-be'aya
interest-his.GEN in.the-problem
'his interest in the problem'

(8) a. le rétrécissement du pantalon au lavage (French)
the shrinking of.the pants in.the washing
'the pants' shrinking in the washing'

b. l'intérêt de Marie pour ce livre
the-interest of Marie for this book
'Marie's interest in this book'

(9) a. az ing össze-gyür-öd-és-e (Hungarian)
the shirt PRT(together)-wrinkle-UNACC-NOMINAL-AGR
'the shirt's wrinkling'

b. János-nak a téma iránti érdekl-öd-és-e
János-DAT the topic regarding interest-DECAUS-NOMINAL-AGR
'János' interest in the topic'

Unaccusative and subject-Experiencer nominals are possible in French (8a–b), although their verbal counterparts appear with the *se* morpheme. The aforementioned morpheme's incompatibility with nouns does not block their formation; they are simply created without valence-reduction morphology. This further undermines the possibility for an account for the absence of reflexive and reciprocal nominals in Romance and Serbian (§15.2.1) simply in terms of morphological incompatibility of the *se* morpheme.

15.2.3 *Passives*

Interestingly, there are no nominal passives that are morphologically coded as such. This is particularly conspicuous in Hebrew: the verbal passive templates *CuCaC* and *huCCaC* do not have corresponding nominal templates.

Moreover, verbal templates that are ambiguous between a passive reading and a non-passive reading (i.e. unaccusative, reflexive, or reciprocal), such as *niCCaC*, have a corresponding nominal template (*hiCCaCut*) which only supports the non-passive reading:[2,3]

(10) a. Ha-nasix nextaf al yedey ha-šoded. (Hebrew)
the-prince kidnapped.PASV on hands the-robber
'The prince was kidnapped by the robber.'

b. * hexatfut ha-nasix
kidnapping.PASV the-prince

(11) a. Ha-rav ne'erax le-vo ha-xag.
the-Rabbi prepared.REFL to-arrival the-holiday
'The Rabbi prepared for the arrival of the holiday.'

b. Ha-šulxan ne'erax al yedey ha-melcar.
the-table set.PASV on hands the-waiter
'The table was set by the waiter.'

c. he'arxut ha-rav le-vo ha-xag
preparation.REFL the-Rabbi to-arrival the-holiday
'the Rabbi's preparation for the arrival of the holiday'

d. * he'arxut ha-šulxan (al yedey ha-melcar)
setting.PASV the-table (on hands the-waiter)

(12) a. Sedek nocar be-xazit ha-binyan.
crack formed.UNACC in-front the-building
'A crack formed in the front part of the building.'

b. Ha-pesel nocar al yedey oman šveycari.
the-sculpture created.PASV on hands artist Swiss
'The sculpture was created by a Swiss artist.'

c. hivacrut sedek be-xazit ha-binyan
formation.UNACC crack in-front the-building
'the formation of a crack in the front part of the building'

d. * hivacrut ha-pesel al yedey oman šveycari
creation.PASV the-sculpture on hands artist Swiss

Notice that there is nothing specifically wrong with nominalizing the verbs in (11d, 12d). The corresponding non-passive nominals do exist:

[2] This observation is due to Shani Erez and Dov Murik (personal communication).

[3] The forms in (11c–d, 12c–d) (*he'arxut*, *hivacrut*) do not by themselves represent any specific voice; rather, they represent general valence-reduction morphology in Hebrew (see §15.2.1).

(13) a. arixat ha-melcar et ha-šulxan
setting the-waiter ACC the-table
'the waiter's setting of the table'

b. yecirat ha-oman et ha-pesel
creation the-artist ACC the-sculpture
'the artist's creation of the sculpture'

Moreover, these nominals allow dropping the external argument, without being morphologically marked, as discussed in the next section.

15.2.4 *Nominals involving arbitrary saturation*

15.2.4.1 *Nominals claimed to be passive* Consider the nominals in (14a–b):

(14) a. arixat ha-šulxan (al yedey ha-melcar)
setting the-table (on hands the-waiter)
'the setting of the table (by the waiter)'

b. yecirat ha-pesel (al yedey ha-oman)
creation the-sculpture (on hands the-artist)
'the creation of the scultpure (by the artist)'

Such cases have often been claimed to be passive nominals lacking morphological marking. However, notice that, unlike regular verbal passives, these require that their implicit external argument be [+*human*]. This is why omission of the *by*-phrase with nouns denoting activities specific to animals (e.g. *hakaša* 'biting', which is specific to snakes) results in anomalous expressions (15b, 17b, 19) – in contrast with the corresponding verbal passives (16, 18):[4]

(15) a. hakašat ha-yeled al yedey ha-naxaš (Hebrew)
biting the-boy on hands the-snake
'the biting of the boy by the snake'

b. # hakašat ha-yeled
biting the-boy

(16) Ha-yeled hukaš (al yedey naxaš).
the-boy bite.PASV (on hands snake)
'The boy was bitten (by a snake).'

(17) a. ukushenie rebjonka sobakoj (Russian)
biting child.GEN dog.INSTR
'the biting of the child by the dog'

[4] Hungarian has no eventive verbal passive (see Kiss (2002)).

b. # ukushenie rebjonka
biting child.GEN

(18) Rebjonok byl ukushen (sobakoj)
child.NOM was bitten (dog.INSTR)
'The child was bitten (by the dog).'

(19) * Peter a megcsíp-és-e (Hungarian)
Peter the sting-NOMINAL-AGR
(Szabolcsi (1994))

In addition to the lack of passive morphology, this divergence from the behaviour of verbal passives casts further doubt on the idea that (14a–b, 15a–b, 17a–b, 19) are simply the nominal counterparts of the corresponding passive verbs (16, 18). The former require their implicit external argument to be [+*human*], which is typical of the operation of arbitrary saturation, as discussed below.

15.2.4.2 *Saturation and arbitrary saturation* Following Chierchia (2004) and Reinhart (2002), we assume that passivization involves saturation of the external θ-role. A saturated θ-role is a role that is assigned, in the semantics, to a variable bound by an existential operator, as schematized in the semantic representation (20b) of example (20a):[5]

(20) a. The room was cleaned.

b. $\lambda e.\exists x$ [cleaning(e) $\wedge$ Agent(e,x) $\wedge$ Theme (e, [[the room]])]

Unlike 'regular' saturation (20), arbitrary saturation creates a variable, the range of which is restricted to [+*human*] individuals (following Chierchia (2004)). In French, for example, arbitrary saturation occurs in impersonal passives, which use the *se* morphology (21) (compare with the regular, periphrastic passive in (22)) and in middles (23).

(21) a. Il s'est dévoré beaucoup d'enfants dans cette
it SE-was devoured lots of-children in this
région. (French)
region
'Many children have been devoured in this region by humans.'

b. $\lambda e.\exists x_{Arb}$ [devouring(e) $\wedge$ Agent(e,x_{Arb}) $\wedge$ Theme (e, [[many children]]) $\wedge$ in (e, [[this region]])]

(22) a. Il a été dévoré beaucoup d'enfants dans cette région.
it has been devoured lots of-children in this region
'Many children have been devoured in this region.'

[5] The semantic representations herein abstract away from clausal features (e.g. tense, aspect).

b. λe.∃x [devouring(e) ∧ Agent(e,x) ∧ Theme (e, [[many children]]) ∧ in (e, [[this region]])]

It is the case that (21a) can only refer to an episode of cannibalism, whereas (22a) can also describe an attack by wolves etc. – which is expected if arbitrary saturation (unlike 'regular' saturation, of the kind implicated in regular passivization) restricts the denotation of the implicated variable to the set of *humans*.

(23) a. Des courgettes crues se mangent souvent (à Genève)
a(PL) fresh zucchinis SE eat often (in Geneva)
(French)

b. Gen e, x_{Arb}:[6]
[eating(e) ∧ Agent(e,x_{Arb}) ∧ Theme (e, [[fresh zucchinis]])]
[often(e,x_{Arb})]

Similarly, the sentence in (23) (a case of middle formation) can only refer to eating by a person (and not eating by rabbits, for example).

15.2.4.3 *Arbitrary saturation in nominals* Given the behaviour discussed in §15.2.4.1, it appears that the nominals in (14a–b, 15a–b, 17a–b, 19) involve arbitrary saturation, on a par with impersonal passives and middles (as discussed in §15.2.4.2). This is illustrated using the example in (24):

(24) a. yecirat ha-bor (Hebrew)
creation the-hole
'The creation of the hole'

b. λe.∃x_{Arb} [creation(e) ∧ Agent(e,x_{Arb}) ∧ Theme (e, [[the hole]])][7]

As such, the nominals discussed in this section (and exemplified in §15.2.4.1) cannot be the nominal counterparts of verbal passives. In other words, event nominals reject regular saturation; the saturation they undergo is arbitrary, whence their implicit external argument must be [+*human*].[8]

[6] The operator *Gen* is a dyadic operator, binding any free variable in its scope and relating two open formulas. In this case, it binds the event variable e and the arbitrarily saturated variable x_{Arb}. It relates the first formula, describing the *eating* event, to a second formula, representing the fact that the event e (the same event implicated in the first formula) has the property of being easy for the participant x_{Arb} (see Marelj (2004)).

[7] We abstract away from the semantic contribution of the definite article *the* (namely closure of the event variable e).

[8] We believe that Hebrew tough constructions (studied extensively by Botwinik-Rotem (2004), Engelhardt (1998)) can, in fact, be analysed as cases of generic middle constructions, which are based on nominal predicates:

In sum, unaccusative and subject-Experiencer nominals are attested in all the sampled languages, while reflexive and reciprocal nominals are attested only in some languages (in Hebrew, Russian, and Hungarian, but not in Romance and Serbian). Finally, true passive nominals are not attested at all. We now show that the Lexicon-Syntax Parameter to be discussed below is responsible for much of the variation exhibited in the domain of nominal voices.

15.3 Proposal

15.3.1 *Background – reflexives and reciprocals cross-linguistically*

Reinhart & Siloni (2005) propose the Lex(icon)-Syn(tax) parameter (25), from which a cluster of cross-linguistic distinctions in the behaviour of reflexive and reciprocal verbs across languages is shown to follow. Some of these distinctions are summarized in (26). We abstract away here from the working of the operations of reflexivization and reciprocalization themselves (for more on reflexives, see Reinhart & Siloni (2005); on reciprocals, see Siloni (2008)).

(25) *The Lex-Syn Parameter:*
Arity (valence changing) operations apply in the lexicon or in the syntax. (Reinhart & Siloni (2005))

(26) *Cross-linguistic distinctions governed by the Lex-Syn parameter:*

	Value = Lexicon	*Value* = Syntax
Limited set	Yes	No
ECM	No	Yes
Lack of transitive alternate	Possible	Impossible
Unique idioms	Possible	Impossible
Independent semantic drift	Possible	Impossible

Terms:

a. *Limited set:* Whether reflexivization and reciprocalization are fully productive, or can apply only to a limited set of predicates.

(i) tanurim xadašim hem kalim le-nikuy (Hebrew)
ovens new they(COPULA) easy to-clean
'New ovens are easy to clean.'
Gen e, x_{Arb}:
[cleaning(e) ∧ Agent(e,x_{Arb}) ∧ Theme (e, [[new ovens]])] [easy(e,x_{Arb})]

The form *nikuy* 'clean' in (i) is a nominal form, suggesting that (i) is formed by inserting the (already arbitrarily saturated) nominal form into a copular sentence, instead of applying arbitrary saturation to generate a middle verb form, as in the French example (23).

b. *ECM:* Whether reflexivization and reciprocalization can apply to ECM predicates (relating arguments of two separate predicates).

c. *Lack of a transitive alternate:* Whether specific languages can have reflexive and/or reciprocal verbs that lack a transitive alternate.

d. *Unique idioms:* Whether there are phrasal idioms involving reflexive and/or reciprocal verbs, which do not apply to their transitive alternate.

e. *Independent semantic drift:* Whether semantic drift can apply to a reflexive or a reciprocal without applying to the meaning of the verb from which it was derived.

To understand how these distinctions follow from the setting of the parameter, consider the consequences of the different locus of operation for reflexivization/reciprocalization in different languages. Productivity is not in principle impossible for lexical operations. It is important to note that the sets of (lexical) reciprocals and reflexives are rather coherent cross-linguistically. The exact definition of the sets is not yet understood. It may turn out that specific properties of the lexicon determine the definition of these sets. However, even if the sets are to some extent language-specific, it seems theoretically convenient that these idiosyncrasies fall in the domain of the lexicon. It has often been argued independently of the question of reciprocalization or reflexivization that irregularities are confined to the lexicon, which contains lists that have to be acquired anyway, whereas the syntactic component is a productive engine 'uncontaminated' by idiosyncrasies. The difference in productivity (26a) between the lexical and syntactic setting of the Lex-Syn parameter corresponds to this view of the two components. Crucially, additional evidence points in the same direction.

There is no syntactic structure in the lexicon; assuming otherwise amounts to 'duplication' of syntactic mechanisms in a second grammatical locus. Hence, there is no possible relation between distinct predicates; they are unrelated entries on a list. Lexical operations are therefore restricted to operate on a single predicate and its θ-grid. A syntactic operation, on the other hand, can affect the θ-roles of two distinct predicates, provided the syntax has placed them in a sufficiently local configuration. Thus, syntactic reflexivization and reciprocalization can apply to ECM predicates, whereas their lexical counterparts cannot (26b).

It has often been suggested in the literature that the lexicon includes entries that are 'frozen' (e.g. Chierchia (2004)). By frozen entries, we mean entries that exist in the lexicon but cannot be inserted into the syntax, and hence

are not part of the actual 'vocabulary' of a given language.[9] If frozen entries are available in the lexicon, they can feed lexical operations, but will not be able to feed syntactic operations. Thus, a frozen transitive verb will be able to feed lexical reflexivization and/or lexical reciprocalization, giving rise to a reflexive/reciprocal lacking an apparent transitive alternate. Conversely, a frozen transitive verb cannot feed the syntactic counterparts of these operations, as they obviously require their input to be present in the syntax in the first place. Thus, syntactic reflexives/reciprocals do not lack a transitive alternate (26c).

The distribution of phrasal idioms, with respect to the types of verbs in question, can be accounted for under the assumption that a phrasal idiom can only be lexicalized (i.e. listed in the lexicon) if its matrix predicate exists in the lexicon (see Horvath & Siloni (2008)). Obviously, a verb that is the output of a syntactic operation does not exist as an entry in the lexicon. Therefore, it can only participate in idioms that are available for its transitive alternate – the lexical entry that serves as input for the syntactic reflexivization or reciprocalization operation (26d).

Finally, semantic drift requires lexicalization of meaning. To be more explicit, this means listing the entry and its idiosyncratic meaning in the lexicon. If a verb is formed in the syntax, it is unavailable as an entry in the lexicon, and such listing of idiosyncratic meaning is impossible (26e).[10]

15.3.2 *Reflexive and reciprocal nominals – an account*

When one considers the data on nominalizations (presented in §15.2) in light of the Lex-Syn parameter (§15.3.1), the following generalizations emerge:

(27) a. *Hebrew, Russian, Hungarian:*

- Reflexivization and reciprocalization apply in the lexicon
- Reflexive and reciprocal nominals exist

[9] See Horvath & Siloni (2008) for the claim that a lexical entry is frozen if one of its θ-roles is inert, that is, inaccessible outside the lexicon. Section 15.5 resumes the claim that entries may have an inert θ-role.

[10] Primary results of work conducted in the framework of the Israel Foundation for Science Project (grant 44/05) reveal coherent and statistically extremely significant cross-linguistic split among lexically vs. syntactically formed predicates with regard to distinctions (26c–e), as expected by the Lex-Syn parameter. Note that the claim regarding (26c–e) is statistical; isolated instances can, of course, be listed in the lexicon even in languages forming their reflexives/reciprocals in the syntax. Such languages, however, are not expected to have more than isolated instances, if any at all, unlike languages forming these predicates in the lexicon.

b. *Romance, Serbian:*
- Reflexivization and reciprocalization apply in the syntax
- Reflexive and reciprocal nominals do not exist

Assuming nominalization is a lexical operation, following Siloni (1997) (see also Bierwisch (this volume); for a different view on nominalizations, see Alexiadou (this volume), Harley (this volume), and Roeper & van Hout (this volume)), the above generalizations immediately follow. In languages where reflexivization and reciprocalization apply in the lexicon (Hebrew, Russian, Hungarian), the lexicon obviously contains reflexive and reciprocal entries, which can in turn serve as input for the operation of nominalization. The order of morphemes in agglutinative languages, such as Hungarian, suggests that reflexivization or reciprocalization (as the case may be) indeed precede nominalization (see example (2), above).

In languages where reflexivization and reciprocalization apply in the syntax (Romance, Serbian), the lexicon will not contain reflexive and reciprocal entries, which are the necessary input for nominalization forming reflexive and reciprocal nominals respectively (but see §15.4).

15.3.3 *Lexicon vs. syntax: further evidence*

15.3.3.1 *Decausativization* Along with Reinhart (2002) and Reinhart & Siloni (2005), we assume that unaccusatives and subject-Experiencer verbs are derived by the operation of decausativization, which reduces the external CAUSE role altogether (a CAUSE role is a role underspecified for animacy and can therefore be realized as animate-Agentive or not). Consider the following example, involving *break*:

(28) a. *break:* <CAUSE><THEME>

b. [John]/[the wind]/[a hammer] broke the vase.

c. John broke the vase with a hammer.

(29) a. Decausativization: *break:* <CAUSE><THEME>→*break:* <THEME>

b. The vase broke.

c. λe [breaking(e) ∧ Theme (e, [[the vase]])]

d. * The vase broke with a hammer.

The entry in (28) is the transitive entry for *break*, which has both CAUSE and THEME roles. When an Agent (e.g. *John*) is realized, an Instrument modifier is licensed (28c), in concert with the Instrument Generalization, which states that an Instrument is licensed only if an explicit or implicit Agent is available

(Reinhart & Siloni (2005)). When decausativization applies, the CAUSE argument is completely eliminated, as schematized in the semantic representation (29c) of the unaccusative in (29b). The absence of the external θ-role, even at the level of interpretation, is evinced by the incompatibility of an Instrument modifier (29d). If an implicit CAUSE were present in the semantics, an Instrument would be possible, as a CAUSE role allows for Agent interpretation. Compare this with the verbal passive in (30), in which the CAUSE role, though absent from syntax, is present at the level of interpretation (30a) (because of saturation having applied to it; see §15.2.4.2), thus licensing an Instrument modifier (30b):

(30) a. The vase was broken.

b. $\lambda e.\exists x$ [breaking (e) $\wedge$ Cause (e,x) $\wedge$ Theme (e, [[the vase]])]

c. The vase was broken with a hammer.

Subject-Experiencers are derived from object-Experiencers by the same operation, namely decausativization: the CAUSE role of an object-Experiencer verb is reduced, giving rise to the subject-Experiencer verb.[11, 12] Recall now that unaccusative and subject-Experiencer nominals are possible in all the sampled languages (see §15.2.2). If the proposal we advance is on the right track, then decausativization in these languages ought to be a lexical operation, as nominalization can apply only to existing lexical entries. Indeed, it seems that decausativization applies in the lexicon cross-linguistically. Decausative verbs do not exhibit the type of cross-linguistic variation attested by reflexive and

[11] As argued by Reinhart (2001), Reinhart (2002), the fact that subject-Experiencers are not unaccusative (that is, their EXPERIENCER argument is mapped externally) is a result of the mapping instructions given to EXPERIENCER roles at the Lexicon-Syntax interface being different than those given, for example, to THEME roles.

[12] With Reinhart (2002), we believe that the operation of decausativization is distinct from the operation that adds an external θ-role to unergatives and transitive verbs (i), namely causativization:

(i) a. The soldiers marched to the mess hall.

b. The sergeant marched the soldiers to the mess hall.

An approach that collapses the two alternations into one cannot explain, for example, why the transitive alternate of unaccusatives (and subject-Experiencers) selects a CAUSE role as its external argument, whereas causativization (in our sample) adds an AGENT to its unergative/transitive input. To see this distinction, compare the incompatibility of causativized verbs with an inanimate subject (ii), versus the compatibility of the transitive alternates of unaccusatives (such as break) with inanimate subjects (iii):

(ii) * Their hunger marched the soldiers to the mess hall.

(iii) a. [John]/[the storm]/[the branch] broke the window.

b. The window broke.

We do not deal with causative nominals in this chapter.

reciprocal verbs (§15.3.1). In all the sampled languages, they may lack a transitive alternate, may appear in phrasal idioms that are not available for their transitive counterparts, and can undergo semantic drift independently of their transitive alternate, on a par with reflexives and reciprocals in languages that perform reflexivization and reciprocalization in the lexicon (§15.3.1). Thus, for example, in Hebrew, the unaccusative *naval* 'wilted' has a frozen transitive alternate (does not have a transitive alternate in the vocabulary), the phrasal idiom *nafla haxlata* 'fell decision' ('a decision has been made') is not shared by its transitive alternate, and the unaccusative *hitkapel* 'folded' has a drifted meaning 'retracted', which its transitive counterpart does not have.

The reason why decausativization must be lexical may lie in the Lexicon Interface Guideline (31), which bans manipulations of θ-grids in the syntactic component.

(31) *The Lexicon Interface Guideline:* (Siloni (2002))
The syntactic component cannot manipulate θ-grids; elimination, modification, or addition of θ-roles is illicit in the syntax.

Dimitriadis (2004) suggests deriving a similar insight from the basic properties of the semantic representation: operations in the syntax apply to syntactic structure, which is already associated with event-semantic representations. Operations eliminating an argument from the semantic representation or manipulating its content are logically illicit. In the lexicon, such operations apply to actual predicates and their θ-grid, and not to event-semantic representations (which are built based on syntactic structure). Hence, decausativization is licit.

15.3.3.2 *Passivization* Verbal passives always have a transitive alternate,[13] may not appear in phrasal idioms that are not applicable to their transitive counterpart, and cannot undergo semantic drift independently of their transitive counterpart. Based on these and other factors, Horvath & Siloni (2008) conclude that verbal passives are formed in the syntax, and hence are not present in the lexicon.

As evinced by the data in §15.2.3, a passive verb cannot feed nominalization. This is expected if verbal passives are outputs of a syntactic operation, and nominalization is restricted to the lexical component. However, 'subject-less' event nominals can be formed from two-place (or higher-valence) verbs by means of arbitrary saturation, as shown in (24), repeated below:

[13] Hillel Taub-Tabib (personal communication) notes that the only exception to this generalization that is mentioned in the literature is the ECM passive *rumoured* ('John was rumoured to be sent to London'), which does not have a transitive alternate. The exception proves the rule. As mentioned in footnote 10, isolated instances, such as *rumoured*, can be listed in the lexicon separately.

(32) a. yecirat ha-bor (Hebrew)
creation the-hole
'The creation of the hole'

b. $\lambda e.\exists x_{Arb}$ [creation(e) $\wedge$ Agent(e,x_{Arb}) $\wedge$ Theme (e, [[the hole]])]

As noted in §15.2.4, this process systematically differs from regular passive formation in that it only supports an interpretation in which the missing (that is, syntactically unrealized) argument is [+*human*].

15.4 Czech: an alternative path of derivation

Unlike Romance and Serbian, Czech allows reflexive and reciprocal event nominals (33a–b) – despite the fact that the properties of its reflexive and reciprocal verbs clearly show that they are formed in the syntax (Hron (2005)):

(33) a. Petrovo umytí se za pět minut situaci
Peter.GEN washing SE in five minutes situation
nezachránilo. (Czech)
NEG.rescued
'Peter's washing in five minutes did not rescue the situation.'

b. Nepřetržité hádání se jejich dětí jim zkazilo
constant quarrelling SE their children.GEN them ruined
celou dovolenou.
whole vacation
'Constant quarrelling of their children ruined the whole vacation for them.'

The problem is why Czech, unlike the other languages that form reflexives and reciprocals in the syntax, allows reflexive and reciprocal nominals. Hron (2005) examines two possible solutions. First, that contra Siloni (1997), nominalization can apply in the syntax in Czech (though not in Romance or Serbian). Since the output of Czech reflexivization and reciprocalization is obviously available in the syntax, this would facilitate the formation of reflexive and reciprocal nominals. Alternatively, Czech reflexive and reciprocal nominals are formed by reflexivization or reciprocalization of two-place nominals (and not by nominalization of reflexive/reciprocal verbs).

Showing that Czech reflexive/reciprocal nominals cannot be argued to be formed by syntactic nominalization of the corresponding reflexive/reciprocal, Hron (2005) suggests that they are derived by reflexivization/reciprocalization of the corresponding transitive nominal. He further shows that, as is expected from the setting of the Lex-Syn parameter,

reflexivization/reciprocalization of nominals in Czech is a syntactic operation, just like reflexivization/reciprocalization of verbs: it is productive and possible with ECM nominals. Two problems remain. First, what prevents this derivational path (reflexivization or reciprocalization of nominals) in Romance and Serbian? Second, if arity operations (e.g. reflexivization and reciprocalization) can apply to nouns in the syntax in Czech, why does Czech have no passive nominals, which would be formed by passivization of nouns in the syntax?

Let us start with the first problem. Recall first that the reflexive/reciprocal morphology in Romance (and Serbian) is a verbal clitic (*se)* incompatible with nominals, unlike its Czech equivalent. Hence, reflexive/reciprocal nominals morphologically marked (of the Czech type) are blocked. Yet, this in itself cannot explain the unavailability of reflexive/reciprocal nominals in Romance (Serbian): as shown in §15.2.2, morphological incompatibility of the clitic (*se*) with nominals does not block the formation of unaccusative and subject-Experiencer nominals. So, the question is why is it impossible to derive reflexive/reciprocal nominals with no morphological marking from the corresponding transitive nouns? The reason for that, we believe, lies in the role of the valence-reducing morphology for Case reduction. Reinhart & Siloni (2005) argue that when valence-reducing operations apply in the syntax, the Case-reduction morphology is obligatory, as it reduces the Case of the reduced argument. In the lexicon, the valence-reducing operation itself involves Case reduction. Hence, no special device is needed for Case reduction, and outputs can appear without special morphology. Romance unaccusatives and subject-Experiencer nominals and Russian reflexive/reciprocal nominals, which bear no morphological marking, are possible as they are formed in the lexicon. In the syntax, this is impossible. In Romance (and Serbian), reflexivization and reciprocalization are set to apply in the syntax, hence there can be no morphologically unmarked reflexive and reciprocal nouns.

Turning now to the second problem: Why does Czech lack passive nominals? In Czech, just like in the other languages in our sample, the implicit external argument of event nominals must be [+*human*]: (34) is impossible, as the implicit role must be a flower (Hron (2005)).

(34) * Rozkvetení za jedinou noc nás nadchlo. (Czech)
Blooming in only one night us.fascinated
(Hron (2005))

As discussed in §15.2.4.2, the formation of such nominals involves arbitrary saturation. Recall that true passivization of a two-place nominal would involve 'regular' saturation of the kind involved in the formation of regular verbal passives (see §15.2.4.2 for discussion of the two types of saturation). This of

course leaves open the question of why saturation in nominals (at least in Hebrew, Russian, Hungarian, and Czech) must be of the arbitrary sort. Let us consider the following possibility: the operation of event nominal formation itself involves marking of the external role for arbitrary saturation (along lines proposed by Grimshaw (1990), who argues that nominalization always involves 'suppression' of the external argument, and Hron (2005)). A role that has been marked for arbitrary saturation can subsequently be lexically realized, assigned to a variable, the scope of which is limited to the group of humans, or reduced by decausativization. What it cannot undergo is a different type of saturation (i.e. non-arbitrary). The next section provides some support for this explanation.

15.5 Arbitrary saturation and object-Experiencer nominals

While subject-Experiencer event nominals seem to be possible cross-linguistically, object-Experiencer verbs do not constitute a uniform class with respect to the formation of event nominals.[14] Some have corresponding nominals (35a), and some do not (35b). This is illustrated below with Hebrew examples. From our preliminary search, it seems that object-Experiencer verbs split this way also in other languages (e.g. Hungarian), but the particular items on each group are not identical across languages.

(35) a. *hifxid* 'scare' – *hafxada*; *'ina* 'torment' – *'inuy*; *gera* 'stimulate' – *geruy*; *he'eliv* 'insult' – *ha'alava*; *kišef* 'enchant' – *kišuf*; *šixne'a* 'persuade' – *šixnu'a*; *hišpil* 'humiliate' – *hašpala*; *hesit* 'incite' – *hasata*

b. *hiršim* 'impress' – **haršama*; *ce'er* 'sadden' – **ce'ur*; *hitmiha* 'puzzle' – **hatmaha*; *hidhim* 'amaze' – **hadhama*; *hamam* 'shock' – **himum*; *sime'ax* 'delight' – **simu'ax*; *ye'eš* 'despair' – **ye'uš*

Landau (2002) brings to light another split in the behaviour of object-Experiencer verbs: some allow passivization, and some do not. Interestingly, precisely the same verbs that do not have corresponding event nominals (35b) do not allow passivization either (36b), while the ones that give rise to nominalizations (35a, 36a) allow it:

(36) a. *hufxad* 'scare.PASV'; *'una* 'torment.PASV'; *gura* 'stimulate.PASV'; *hu'alav* 'insult.PASV'; *kušaf* 'enchant.PASV'; *šuxna* 'persuade.PASV'; *hušpal* 'humiliate.PASV'; *husat* 'incite.PASV'

[14] It has also been argued that the transitive alternates of unaccusative verbs do not give rise to event nominals. However, as shown by Borer (2005), they do have corresponding event nominals (with the exception of *grow*/*growth*).

b. **huršam* 'impress.PASV'; **cu'ar* 'sadden.PASV'; **hutma* 'puzzle.PASV'; **hudham* 'amaze.PASV'; **humam* 'shock.PASV'; **sumax* 'delight.PASV'; **sumax* 'please.PASV'; **yu'aš* 'despair.PASV'

Finally, Meltzer (2005) reveals that object-Experiencer verbs split also with regard to Agent interpretation, again partitioning the verbs into exactly the same two groups. This is shown by the addition of Agent-oriented adverbs or purpose clauses, which diagnose Agenthood. While they can be added to sentences involving the verbs in (35a, 36a), they give rise to ungrammaticality if the object-Experiencer verb is one that lacks a corresponding event nominal (35b) and rejects passivization (36b):

(37) a. Dan hifxid/'ina/... et Dina be-xavana. (Hebrew)
Dan scared/tormented/... ACC Dina in-purpose
'Dan scared/tormented/... Dina on purpose.'

b. Dan he'eliv/hišpil/... et Dina kedey še-hi
Dan insulted/humiliated/... ACC Dina in.order that-she
ta'azov oto.
leave.FUT him
'Dan insulted/humiliated/... Dina in order for her to leave him.'

(38) a. * Dan hiršim/ce'er/hidhim... et Dina be-xavana.
Dan impressed/saddened/amazed... ACC Dina in-purpose

b. * Dan hitmi'a/ye'eš/sime'ax/... et Dina kedey
Dan puzzled/despaired/delighted/... ACC Dina in.order
še-hi ta'azov oto.
that-she leave.FUT him

Pesetsky (1995) argues that object-Experiencers involve three θ-roles: CAUSE, EXPERIENCER, and SUBJECT-MATTER. Furthermore, they cannot realize their CAUSE and SUBJECT-MATTER roles together in the same derivation. Reinhart (2002) shows that these concepts have three options of realization as verbs: leaving one of the two mutually exclusive roles unrealized (39a–b, 40a–b), or undergoing decausativization (39c, 40c).

(39) a. [The doctor]$_{\text{CAUSE}}$ worried [the patient]$_{\text{EXPERIENCER}}$.

b. [His health]$_{\text{SUBJECT-MATTER}}$ worried [the patient]$_{\text{EXPERIENCER}}$.

c. [The patient]$_{\text{EXPERIENCER}}$ worried ([about his health]$_{\text{SUBJECT-MATTER}}$).

(40) a. [Ha-rofe]$_{\text{CAUSE}}$ hid'ig [et ha-xole]$_{\text{EXPERIENCER}}$. (Hebrew)
the-doctor worried ACC the-patient
'The doctor worried the patient.'

b. [Bri'ut-o]$_{\text{SUBJECT-MATTER}}$ hid'iga [et ha-xole]$_{\text{EXPERIENCER}}$.
health-his.GEN worried ACC the-patient
'His health worried the patient.'

c. [Ha-xole]$_{\text{EXPERIENCER}}$ da'ag ([odot bri'ut-o]$_{\text{SUBJECT-MATTER}}$).
the-patient worried (about health-his.GEN)
'The patient worried (about his health).'

As evinced by the different morphological form that the verb bears in (40b) and (40c), these are indeed two different verbal entries, despite the fact that the same set of θ-roles is realized in each case. For the different mapping of roles (external vs. internal) in each case, see Reinhart (2002). Note, however, that, in a sentence where the EXPERIENCER is mapped internally (39a, for example), a [+*human*] subject favours the Agentive reading, but can also be interpreted as SUBJECT-MATTER in the appropriate context.

On the basis of French data, Friedemann (2000) argues that verbs such as those in (35b) have a CAUSE role that is inert – namely inaccessible outside the lexicon – and that this property is what distinguishes them from the verbs in (35a). This explains why they fail Agenthood diagnostics: if their CAUSE role cannot be inserted in the syntax, it is obviously not present in the semantics either. Therefore Agent-oriented modifiers cannot be used, as the verb bears no role that is interpretable as AGENT (recall the CAUSE role is unspecified with regard to animacy and can therefore be realized/interpreted as AGENT or not). Thus, in (38), the subject is a SUBJECT-MATTER argument. Relying on that, Meltzer (2005) argues that verbs such as the ones in (35b) cannot passivize (as shown in (36b)), since the saturation implicated in passivization involves assignment of the saturated θ-role to a variable in the semantics. If the relevant role (here, the CAUSE role) is inaccessible outside the lexicon, it cannot be assigned in the semantics either (for further discussion of the behaviour of inert roles, see Horvath & Siloni (2008)).

Why do these verbs not give rise to event nominals? Recall that it was suggested in the previous section (§15.4) that the operation of nominalization implicates marking of the external argument for arbitrary saturation. If this idea is on the right track, then object-Experiencer verbs whose external role is inert are expected to disallow nominalization. An inert role is inaccessible outside the lexicon. However, all the options available to a role marked for arbitrary saturation require that the role be accessible outside the lexical component. For nominalization to occur, the marked role could either be realized lexically, or assigned in the semantics to the corresponding variable. Both options are banned by the inertness of the role. Hence, these nominalizations are blocked.

As mentioned in the beginning of this section, other languages seem to show the same type of partition, although the particular items on each group seem to vary across languages. Indeed, if the account suggested here is correct, this is the expected state of affairs. We do not expect a cross-linguistic consistency as to whether the external role of a certain lexical entry is inert or not. Inertness of roles is certainly idiosyncratic, but learnable. We do expect, however, object-Experiencer verbs that lack a corresponding event nominal to fail to have an Agent interpretation and disallow passivization, as under the present account this cluster of properties follows from a single grammatical factor – namely the inertness of the external role. A preliminary review seems to suggest that this is indeed the case.

15.6 Conclusion

We have shown that considerable cross-linguistic variation attested in the sets of voices available for event nominals (§15.2) is predicted given the Lexicon-Syntax Parameter (Reinhart & Siloni (2005)). Given that nominalization applies in the lexicon (Siloni (1997)), reflexive and reciprocal event nominals will be available only if reflexive and reciprocal entries exist themselves in the lexicon (and are thus available to feed nominalization).

Predictably, in languages where it has been independently established that reflexivization and reciprocalization apply in the syntax (Reinhart & Siloni (2005), Siloni (2008)), reflexive and reciprocal event nominals are predictably impossible. In languages where it has been independently established that reflexivization and reciprocalization apply in the lexicon, such event nominals are possible.

Czech presents an interesting challenge to this account, since it forms reflexive and reciprocal verbs in the syntax, but has reflexive and reciprocal event nominals. We adopted Hron's claim (Hron (2005)) that these nominals in Czech are formed by syntactic reflexivization/reciprocalization of two-place nominals (and not by nominalization of reflexive/reciprocal verbs). To explain why this path of derivation is not available in all languages forming their reflexive/reciprocal verbs in the syntax, we relied on the claim of Reinhart & Siloni (2005) that syntactic valence-reducing operations require a Case-reducer. In Czech, but not in Romance and Serbian, such a Case-absorbing morpheme that can attach to nouns is available. Thus, Czech represents a path of derivation which is not available in the other languages in our sample that reflexivize and reciprocalize in the syntax.

Finally, we examined a split within the group of object-Experiencer verbs, concerning the availability of corresponding event nominals. Based on

Friedemann's proposal (Friedemann (2000)) that some object-Experiencers have an inert external CAUSE role, we propose that the impossibility of corresponding event nominals for these verbs is the result of failure of their inert role to be marked for arbitrary saturation implicated by the operation of nominalization. Passive nominals are banned on comparable grounds. Since the external role of event nominals is marked for arbitrary saturation as part of the nominalization operation, it cannot undergo regular passive saturation.

This page intentionally left blank

Bibliography

Abbott, Barbara (1992). *Definiteness, Existentials, and the 'List' Interpretation*. Paper presented at SALT.

Abdullah, bin Abdul Kadir Munshi (1963). *Hikayat Abdullah, Vol. 2*. Singapore: Pustaka Antara.

Abney, Steven (1987). *The English Noun Phrase in Its Sentential Aspect*. PhD dissertation, MIT.

Ackema, Peter and Neeleman, Ad (2004). *Beyond Morphology. Interface Conditions on Word Formation*. Oxford: Oxford University Press.

Adams, N. (2005). 'Quantification and partitivity in Zulu'. Ms., University of Chicago.

Aissen, Judith (1999). 'Markedness and subject choice in Optimality Theory'. *Natural Language and Linguistic Theory* 17: 673–711.

—— (2003). 'Differential object marking: iconicity vs. economy'. *Natural Language and Linguistic Theory* 21: 435–83.

Alexiadou, Artemis (2001). *Functional Structure in Nominals. Nominalization and Ergativity*. Amsterdam: Benjamins.

—— (2003). 'Some notes on the structure of alienable and inalienable possessors'. In *From NP to DP. Vol. II: The Expression of Possession in Noun Phrases*, Martine Coene and Yves D'Hulst (eds.), 167–88. Amsterdam: Benjamins.

—— (2005). 'Gerund types, the present participle and patterns of derivation'. In *Event Arguments: Foundations and Applications*, Claudia Maienborn and Angelika Wöllstein (eds.), 139–52. Tübingen: Niemeyer.

—— (2007a). *On Argument Supporting Nominals and the Mass vs. Count Distinction*. Paper presented at the NORMS meeting at Lake Mývatn.

—— (2007b). 'Argument structure in nominals'. In *Noun Phrase in the Generative Perspective*, Artemis Alexiadou et al. (eds.), 477–546. Berlin: Mouton de Gruyter.

—— (2008). 'Notes on Greek resultative formation'. Ms., Universität Stuttgart.

—— (this volume). 'On the role of syntactic locality in morphological processes: the case of (Greek) derived nominals'.

—— and Anagnostopoulou, Elena (2007). *Structuring Participles*. Paper presented at WCCFL.

—— and Grimshaw, Jane (2008). 'Verbs, nouns and affixation'. In *SINSPEC* (Working papers of the SFB 732) 1: 1–16.

—— and Müller, Gereon (2008). 'Class features as probes'. In *Inflectional Identity*, Asaf Bachrach and Andrew Nevins (eds.), 101–55. Oxford: Oxford University Press.

—— et al. (2006). 'The properties of anticausatives crosslinguistically'. In *Phases of Interpretation*, Mara Frascarelli (ed.), 187–212. Berlin: Mouton de Gruyter.

—— et al. (2007). *Noun Phrase in the Generative Perspective*. Berlin: Mouton de Gruyter.

Alonso-Ovalle, Luis and Menéndez-Benito, P. (2002). *Two Types of Weak Quantifiers: Evidence from Spanish*. Paper presented at the 1st North American Summer School in Logic, Language and Information.

—— and Menéndez-Benito, P. (2003). *Some Epistemic Indefinites*. Paper presented at NELS.

Anagnostopoulou, Elena (2003). *The Syntax of Ditransitives: Evidence from Clitics*. Berlin: Mouton de Gruyter.

—— and Giannakidou, Anastasia (1995). *Clitics and Prominence, or Why Specificity is Not Enough*. Paper presented at CLS.

Arad, Maya (2003). 'Locality constraints on the interpretation of roots: the case of Hebrew denominal verbs'. *Natural Language and Linguistic Theory* 21: 737–78.

Artiagoitia, X. (2000). *Hatsarreak eta Parametroak Lantzen*. Vitoria-Gasteiz: Arabako Foru Aldundia.

—— (2003). 'Oharrak determinatzaileen inguruan: Oro-k dioena'. In *Euskal Gramatikari eta Literaturari Buruzko Ikerketak XXI. Mendearen Atarian Iker 14 (1)*, J. M. Makatzaga and B. Oyharçabal (eds.), 137–59. Bilbo: Euskaltzaindia.

Asher, Ronald E. and Kumari, T. C. (1997). *Malayalam*. London: Routledge.

Azkarate, M. and Altuna, P. (2001). *Euskal Morfologiaren Historia*. Donostia: Elkarlanean.

Bach, Emmon (1986). 'The algebra of events'. *Linguistics and Philosophy* 9: 5–16.

—— et al. (eds.) (1995). *Quantification in Natural Language*. Dordrecht: Kluwer.

Baker, Carl L. (1970). 'Double negatives'. *Linguistic Inquiry* 1: 169–86.

Baker, Mark et al. (1989). 'Passive arguments raised'. *Linguistic Inquiry* 20: 219–51.

Barwise, Jon and Cooper, Robin (1981). 'Generalized quantifiers and natural language'. *Linguistics and Philosophy* 4: 159–219.

Beaver, David I. and Condoravdi, Cleo (2003). *A Uniform Analysis of Before and After*. Paper presented at SALT 13.

Beck, Sigrid (1996). 'Quantified structures as barriers for LF movement'. *Natural Language Semantics* 4: 1–56.

—— (2005). 'There and back again: a semantic analysis'. *Journal of Semantics* 22: 3–51.

Beghelli, Filippo (1995). *The Phrase Structure of Quantifier Scope*. Doctoral dissertation, UCLA.

—— (1997). 'The syntax of distributivity and pair-list readings'. In *Ways of Scope Taking*, Anna Szabolcsi (ed.), 349–408. Dordrecht: Kluwer.

—— and Stowell, Tim (1997). 'Distributivity and negation: the syntax of *each* and *every*'. In *Ways of Scope Taking*, Anna Szabolcsi (ed.), 71–107. Dordrecht: Kluwer.

Behrens, L. (2005). 'Genericity from a cross-linguistic perspective'. *Linguistics* 43: 275–344.

Bennett, Michael and Partee, Barbara (1978). *Toward the Logic of Tense and Aspect in English*. Bloomington, Indiana: Indiana University Linguistics Club.

Bierwisch, Manfred (1987). 'Semantik der Graduierung'. In *Grammatische und konzeptuelle Aspekte von Dimensionsadjektiven*, Manfred Bierwisch and Ewald Lang (eds.), 91–286. Berlin: Akademie-Verlag.

Bierwisch, Manfred (1989). 'Event nominalizations: proposals and problems'. *Linguistische Studien* 194: 1–73. Berlin: ZISW, Akademie der Wissenschaften.

—— (1990). 'Event nominalizations: proposals and problems'. *Acta Linguistica Hungarica* 40: 19–84.

—— (1997). 'Lexical information from a minimalist point of view'. In *The Role of Economy Principles in Linguistic Theory*, Chris Wilder and Hans-Martin Gärtner (eds.), 227–66. Berlin: Akademie Verlag.

—— (2006). 'Thematic roles – universal, particular, and idiosyncratic aspects'. In *Semantic Role Universals and Argument Linking*, Ina Bornkessel et al. (eds.), 227–66. Berlin: Mouton de Gruyter.

—— (this volume). 'Nominalization – lexical and syntactic aspects'.

Blake, Barry J. (2001). *Case*. Cambridge: Cambridge University Press.

Bloomfield, Leonhard (1956). *Eastern Ojibwa: Grammatical Sketch, Texts and Word List*. Ann Arbor: University of Michigan Press.

Bock, J. and Warren, R. (1985). 'Conceptual accessibility and syntactic structure in sentence formulation'. *Cognition* 21: 47–67.

Borer, Hagit (1993a). 'Parallel morphology'. Ms., University of Massachusetts at Amherst.

—— (1993b). *Derived Nominals*. Amherst: University of Massachusetts.

—— (1998). 'Morphology and syntax'. In *The Handbook of Morphology*, Andrew Spencer and Arnold Zwicky (eds.), 151–90. Oxford: Blackwell.

—— (2003a). 'Exo-skeletal vs. endo-skeletal explanations: syntactic projections and the lexicon'. In *The Nature of Explanation in Linguistic Theory*, John Moore and Maria Polinsky (eds.), 31–68. Stanford: CSLI.

—— (2003b). 'The forming, the formation and the form of nominals.' Ms., USC.

—— (2005a). *Structuring Sense. Vol. II: The Normal Course of Events*. Oxford: Oxford University Press.

—— (2005b). *Structuring Sense. Vol. I: In Name Only*. Oxford: Oxford University Press.

—— (to appear). *Structuring Sense. Vol. III: Taking Form*. Oxford: Oxford University Press.

Bosque, I. (ed.) (1996). *El Sustantivo sin Determinación. La Ausencia de Determinante en la Lengua Española*. Madrid: Visor Libros.

Bosveld-de Smet, L. (1998). *On Mass and Plural Quantification: the Case of French 'des'/'du' NPs*. PhD dissertation, University of Groningen.

Botwinik-Rotem, Irena (2004). *The Category P: Features, Projections and Interpretation*, PhD dissertation, Tel Aviv University.

Brisson, Christine (1998). *Distributivity, Maximality, and Floating Quantifiers*. PhD dissertation, Rutgers University.

—— (2003). 'Plurals, *all*, and the nonuniformity of collective predication'. *Linguistics and Philosophy* 26: 129–84.

Büring, Daniel (1996). *A Weak Theory of Strong Readings*. Paper presented at SALT 14.

Burzio, Luigi (1986). *Italian Syntax*. Dordrecht: Reidel.

Butler, Jonny (2004). *Phase Structure, Phrase Structure, and Quantification*. Doctoral dissertation, University of York.

Cappelle, Bert and Declerck, Renaat (2005). 'Spatial and temporal boundedness in English motion events'. *Journal of Pragmatics* 37: 889–917.

Cappelen, Herman and Lepore, Ernie (2002). 'Indexicality, binding, anaphora and a priori truth'. *Analysis* 62: 271–80.

—— and Lepore, Ernie (2005). *Insensitive Semantics: A Defense of Semantic Minimalism and Speech Act Pluralism*. London: Blackwell.

Carlson, Gregory (1977a). *Reference to Kinds in English*. PhD dissertation, University of Massachusetts, Amherst.

—— (1977b). 'Amount relatives'. *Language* 53: 520–42.

—— and Storto, G. (2006). 'Sherlock Holmes was in no danger'. In *Drawing the Boundaries of Meaning: Neo-Gricean Studies in Pragmatics and Semantics in Honor of Laurence R. Horn*, B. Birner and G. Ward (eds.), 153–70. Amsterdam: Benjamins.

Cheng, Lisa (1995). 'On *Dou*-quantification'. *Journal of East Asian Linguistics* 4: 197–234.

—— (this volume). 'On *Every* type of quantificational expression in Chinese'.

—— and Sybesma, Rint (1999). 'Bare and not-so-bare nouns and the structure of NP'. *Linguistic Inquiry* 30: 509–42.

Chierchia, Gennaro (1984). *Topics in the Syntax and Semantics of Infinitives and Gerunds*. PhD dissertation, University of Massachusetts, Amherst.

—— (1998a). 'Reference to kinds across languages'. *Natural Language Semantics* 6: 339–405.

—— (1998b). 'Plurality of mass nouns and the notion of "semantic parameter" '. In *Events and Grammar*, Susan Rothstein (ed.), 53–103. Dordrecht: Kluwer.

—— (2003). 'Language, thought and reality after Chomsky'. Ms., University of Milan.

—— (2004). 'A semantics for unaccusatives and its syntactic consequences'. In *The Unaccusativity Puzzle: Studies on the Syntax-Lexicon Interface*, Artemis Alexiadou et al. (eds.), 22–59. Oxford: Oxford University Press.

—— and McConnell-Ginet, Sally (1990). *Meaning and Grammar*. Cambridge, MA: MIT Press.

Choe, J.-W. (1987). *Anti-Quantifiers and a Theory of Distributivity*. PhD dissertation, University of Massachusetts, Amherst.

Chomsky, Noam (1965). *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.

—— (1970). 'Remarks on nominalization'. In *Readings in English Transformational Grammar*, Roderick A. Jacobs and Peter S. Rosenbaum (eds.), 184–221. Waltham: Ginn and Company.

—— (1986). *Knowledge of Language. Its Nature, Origin, and Use*. New York: Praeger.

—— (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.

—— (2000). 'Minimalist inquiries: the framework'. In *Step by Step: Essays in Minimalist Syntax in Honor of Howard Lasnik*, R. Martin et al. (eds.), 89–155. Cambridge, MA: MIT Press.

Chomsky, Noam (2001). 'Derivation by phase'. In *Ken Hale: a Life in Language*, Michael Kenstowicz (ed.), 1–52. Cambridge, MA: MIT Press.

—— (2004). 'Beyond explanatory adequacy'. In *Structures and Beyond: the Cartography of Syntactic Structures, Vol. 3*, Adriana Belletti (ed.), 104–31. Oxford: Oxford University Press.

—— (2005). 'Three design features in language design'. *Linguistic Inquiry* 36: 1–22.

Chung, Sandra (1987). 'The syntax of Chamorro existential sentences'. In *The Representation of (In)definiteness*, Eric Reuland and Alice G. B. ter Meulen (eds.), 191–225. Cambridge, MA: MIT Press.

—— (2000). 'On reference to kinds in Indonesian'. *Natural Language Semantics* 8: 157–71.

—— and Ladusaw, William A. (2004). *Restriction and Saturation*. Cambridge, MA: MIT Press.

Cocchiarella, Nino B. (1976). 'On the logic of natural kinds'. *Philosophy of Science* 43: 202–22.

Cohen, Ariel (2001). 'On the generic use of indefinite singulars'. *Journal of Semantics* 18: 183–209.

Collins, Chris (2005). 'A smuggling approach to the passive in English'. *Syntax* 8: 81–120.

Comorovski, Ileana (1988). *Discourse and the Syntax of Multiple Constituent Questions*. PhD dissertation, Cornell University.

Comrie, Bernard (1989). *Language Universals and Linguistic Typology*. Oxford: Blackwell.

Cooper, Robin (1996). 'The role of situations in generalized quantifiers'. In *The Handbook of Contemporary Semantic Theory*, Shalom Lappin (ed.), 65–86. Oxford: Blackwell.

Corbett, Greville G. (2000). *Number*. Cambridge: Cambridge University Press.

Cresswell, M. J. (1976). 'The semantics of degree'. In *Montague Grammar*, B. Partee (ed.), 261–92. New York: Academic Press.

Dahl, Östen (2000). 'Egophoricity in discourse and syntax'. *Functions of Language* 7: 37–77.

—— and Fraurud, Kari (1996). 'Animacy in grammar and discourse'. In *Reference and Referent Accessibility*, Thorstein Fretheim (ed.), 47–64. Amsterdam: Benjamins.

Danon, Gabi (2006). 'Caseless nominals and the projection of DP'. *Natural Language and Linguistic Theory* 24: 977–1008.

Davis, Henry (2000). *Coordination and Constituency in St'at'imcets*. Paper presented at the International Conference on Salish and Neighbouring Languages.

—— (2005). 'On the syntax and semantics of negation in Salish'. *International Journal of American Linguistics* 71: 1–55.

—— et al. (2004). 'Clefts vs. nominal predicates in two Salish languages'. In *Studies in Salish Linguistics in Honor of M. Dale Kinkade*, Donna B. Gerdts and Lisa Matthewson (eds.), 100–117. Missoula, Montana: University of Montana Press.

Dayal, Veneeta (1998). '*Any* as inherently modal'. *Linguistics and Philosophy* 21: 433–76.

—— (2003). 'A semantics for pseudo-incorporation'. Ms., Rutgers University.

—— (2004). 'Number marketing and (in)definiteness in kind terms'. *Linguistics and Philosophy* 27: 393–450.

Dayley, Jon Philip (1985). *Tzutujil Grammar*. Berkeley: University of California Press.

Dekker, Paul (1998). 'Speaker's reference, descriptions and information structure'. *Journal of Semantics* 15: 305–34.

Del Prete, Fabio (2005). *Prima e Dopo*. PhD dissertation, Department of Philosophy, University of Milan.

Diesing, Molly (1992). *Indefinites*. Cambridge, MA: MIT Press.

Dikken, Marcel den (1995). *Particles*. Oxford: Oxford University Press.

Dimitriadis, Alexis (2004). 'An event semantics for the Theta-System'. Ms., Utrecht: Utrecht Institute of Linguistics OTS.

Does, Jaap van der and Hoop, Helen de (1998). 'Type-shifting and scrambled definites'. *Journal of Semantics* 15: 393–416.

Doetjes, Jenny (1997). *Quantifiers and Selection. On the Distribution of Quantifying Expressions in French, Dutch and English*. PhD dissertation, Leiden University.

Doherty, Cathal (1993). *Clauses Without* That: *The Case for Bare Sentential Complementation in English*. PhD dissertation, UCSC.

Downing, Pamela A. (1996). *Numeral Classifier Systems: The case of Japanese*. Amsterdam: Benjamins.

Dowty, David (1979). *Word Meaning and Montague Grammar*. Dordrecht: Reidel.

Eguzkitza, A. (1997). 'Kasuak eta postposizioak: deklinabidea eta postposiziobidea'. *Hizpide* 40: 39–52.

Ehrich, Veronika and Rapp, Irene (2000). 'Sortale Bedeutung und Argumentstruktur: *ung*-Nominalisierungen im Deutschen'. *Zeitschrift für Sprachwissenschaft* 19: 245–303.

Eijk, Jan van (1997). *The Lillooet Language: Phonology, Morphology, Syntax*. Vancouver: UBC Press.

—— and Williams, Lorna (1981). *Cuystwí Malh Ucwalmícwts: Lillooet Legends and Stories*. Mount Currie: Ts'zil Publishing House.

Elordieta, A. (2001). *Verb Movement and Constituent Permutation in Basque*. PhD dissertation, Leiden University.

Embick, David (2000). 'Features, syntax, and categories in the Latin perfect'. *Linguistic Inquiry* 31: 185–230.

—— (2003). 'Locality, listedness and morphological identity'. *Studia Linguistica* 57: 143–69.

—— (2004). 'On the structure of resultative participles in English'. *Linguistic Inquiry* 35: 355–92.

—— and Noyer, Rolf (2007). 'Distributed morphology and the syntax-morphology interface'. In *The Oxford Handbook of Linguistic Interfaces*, Gillian Ramchand and Charles Reiss (eds.), 289–324. Oxford: Oxford University Press.

Engelhardt, Miriam (1998). *The Syntax of Nominalized Properties*, PhD dissertation, Hebrew University of Jerusalem.

—— (2000). 'The projection of argument-taking nominals'. *Natural Language and Linguistic Theory* 18: 41–88.

England, Nora C. (1991). 'Changes in basic word order in Mayan languages'. *International Journal of American Linguistics* 57: 446–86.

Erdmann, P. (1980). 'On the history of subject contact-clauses in English'. *Folia Linguistica Historica* 1: 139–70.

Espinal, M. T. and McNally, Louise (2007). 'Bare singular nominals and incorporating verbs'. *Konstanzer Arbeitspapiere* 122: 45–62.

Etxeberria, Urtzi (2002a). 'Hacia la semántica de algunos determinantes cuantificacionales del Euskara'. Ms., University of the Basque Country (UPV-EHU).

—— (2002b). 'La interpretación de los cuantificadores del Euskara'. *Interlingüística* 13: 53–70.

—— (2004). 'Do all quantifiers behave the same way compositionally?' In *Selected Proceedings of 1st WoSS*, A. Irurtzun and Urtzi Etxeberria (eds.), Vitoria-Gasteiz: ASJU.

—— (2005). *Quantification and Domain Restriction in Basque*. PhD dissertation, University of the Basque Country.

—— (2008). 'On quantification in Basque and on how some languages restrict their quantificational domain overtly'. In *Quantification: A Cross-linguistic Perspective*, Lisa Matthewson (ed.), 225–75. North Holland Linguistics Series, Bingley: Emerald Group Publishing.

—— (this volume). 'Contextually restricted quantification in Basque'.

—— and Giannakidou, Anastasia (2008a). *Contextual Restrictions of Quantifiers and the Definite Determiner*. Paper presented at Context Dependence, Perspective and Relativity in Language and Thought, Paris, Ecole Normale Supérieure.

—— and Giannakidou, Anastasia (2008b). Contextual domain restriction across languages: definiteness, indefiniteness, and the structure of QP.

Euskaltzaindia (1993). *Euskal Gramatika Laburra: Perpaus Bakuna*. Bilbo: Euskal Gramatika Batzordea.

Farkas, Donka (1981). *Indefinite descriptions and the Romance subjunctive mood*, PhD dissertation, University of Chicago.

—— (2002). 'Specificity distinctions'. *Journal of Semantics* 19: 213–44.

—— (2006). 'The unmarked determiner'. In *Indefiniteness and Plurality*, L. Tasmowski and S. Vogeleer (eds.), 81–105. Amsterdam: Benjamins.

—— and Sugioka, Yoko (1983). 'Restrictive *if* / *when* clauses'. *Linguistics and Philosophy* 6: 225–58.

—— and Swart, Henriëtte de (2003). *The Semantics of Incorporation: from Argument Structure to Discourse Transparency*. Stanford: CSLI.

—— and Swart, Henriëtte de (2007). 'Article choice in plural generics'. *Lingua* 117: 1657–76.

—— and Swart, Henriëtte de (this volume). 'Stability and variation in article choice: generic and non-generic contexts'.

Feldman, Harry (1986). *A Grammar of Awtuw*. Canberra: The Australian National University.

Filip, Hana (1996). 'Quantification, aspect and lexicon'. In *Proceedings of the ESSLLI 1996 Conference on Formal Grammar*, Geert-Jan M. Kruijff et al. (eds.), 43–56. Prague: Charles University.

Fintel, Kai von (1994). *Restrictions on Quantifier Domains*. PhD dissertation, University of Massachusetts, Amherst.

—— (1997). 'Bare plurals, bare conditionals, and *only*'. *Journal of Semantics* 14: 1–56.

—— (1998). 'The semantics and pragmatics of quantifier domains'. Ms., MIT.

—— (1999). 'NPI-licensing, Strawson-entailment, and context-dependency'. *Journal of Semantics* 16: 97–148.

Folli, R. and Harley, Heidi (2006). 'Waltzing Matilda'. *Studia Linguistica* 60: 1–35.

—— and Harley, Heidi (2007). 'Causation, obligation and argument structure: On the nature of little v.' *Linguistic Inquiry* 38: 197–238.

Frampton, J. and Gutman, S. (2000). 'Agreement is feature-sharing'. Ms., Northwestern University.

Friedemann, Marc-Ariel (2000). *Worry is Not Preoccuper*. Paper presented at the Utrecht Discussion Group.

Fu, Jingqi et al. (2001). 'The VP within process nominals: evidence from adverbs and the VP anaphor *do-so*'. *Natural Language and Linguistic Theory* 19: 549–82.

Fukui, Naoki and Takano, Yugi (2000). 'Nominal structure: an extension of the symmetry principle'. In *The derivation of VO and OV*, Peter Svenonius (ed.), 321–62. Dordrecht: Kluwer.

Geenhoven, Veerle van (1998). *Semantic Incorporation and Indefinite Descriptions: Semantic and Syntactic Aspects of Noun Incorporation in West Greenlandic*. Stanford: CSLI.

Giannakidou, Anastasia (1998). *Polarity Sensitivity as (Non)veridical Dependency*. Amsterdam: Benjamins.

—— (1999). 'Affective dependencies'. *Linguistics and Philosophy* 22: 367–421.

—— (2000). 'Negative concord?' *Natural Language and Linguistic Theory* 18: 457–523.

—— (2001). 'The meaning of free choice'. *Linguistics and Philosophy* 24: 659–735.

—— (2004). *Domain Restriction and the Arguments of Quantificational Determiners*. Paper presented at SALT 14.

—— (2006). '*Only*, emotive factives, and the dual nature of polarity dependency'. *Language* 82: 575–603.

—— and Anagnostopoulou, Elena (1995). *Clitics and Prominence – Or Why Specificity is Not Enough*. Paper presented at CLS (Parasession on Clitics).

—— and Cheng, Lisa Lai-Shen (2006). '(In)definiteness polarity, and the role of wh-morphology in free choice'. *Journal of Semantics* 23: 135–83.

—— and Merchant, Jason (1999). 'Why Giannis can't scrub his plate clean: on the absence of resultative secondary predication in Greek'. In *Greek Linguistics 1997: Proceedings of the 3rd International Conference on Greek Linguistics*, Amalia Moser (ed.), 93–103. Athens: Ellinika Grammata.

Gil, Kook-Hee (2001). *Floating Quantifiers in Korean*. Harvard and Seoul: Hanshin Publishing Company.

—— and Tsoulas, George. (2006). 'Features, concord, quantification: licensing of conjunctive quantifiers and its implications'. Ms., University of Sheffield and University of York.

—— and Tsoulas, George (this volume). 'Issues in quantification and DP/QP structure in Korean and Japanese'.

—— et al. (2006). 'Disjunction and indeterminate-based quantification in Korean'. Ms., University of York and University of Sheffield.

Gillon, Brendan S. (1987). 'The readings of plural noun phrases in English'. *Linguistics and Philosophy* 10: 199–219.

—— (1992). 'Towards a common semantics for English count and mass nouns'. *Linguistics and Philosophy* 15: 597–640.

Givón, Talmy (ed.) (1994). *Voice and Inversion*. Amsterdam: Benjamins.

Greenberg, Joseph H. (1963). 'Some universals of grammar with particular reference to the order of meaningful elements'. In *Universals of Language*, Joseph H. Greenberg (ed.), 110–13. London: MIT Press.

Grimshaw, Jane (1990). *Argument Structure*. Cambridge, MA: MIT Press.

Grosu, Alexander and Landman, Fred (1998). 'Strange relatives of the third kind'. *Natural Language Semantics* 6: 125–70.

Guéron, Jacqueline (2008). 'On the difference between telicity and perfectivity'. *Lingua* 118: 1816–1840.

Gutiérrez-Rexach, Javier (1999a). 'Spanish indefinites and type-driven interpretation'. In *Formal Perspectives on Romance Linguistics*, J.-Marc Authier et al. (eds.), 151–66. Amsterdam: Benjamins.

—— (1999b). *Group Indefinites*. Paper presented at WCCFL.

—— (2001). 'The semantics of Spanish plural existential determiners and the dynamics of judgment types'. *Probus* 13: 113–54.

Haddican, B. (2001). 'Basque functional heads'. *Linguistics in the Big Apple Working Papers in Linguistics*.

—— (2004). 'Sentence polarity and word order in Basque'. *The Linguistic Review* 21: 81–124.

—— (2005). *Aspects of Language Variation and Change in Contemporary Basque*. PhD dissertation, New York University.

Hale, Ken and Keyser, Samuel Jay (2002a). 'The basic elements of argument structure'. In *Prolegomenon to a Theory of Argument Structure*, Ken Hale and Samuel Jay Keyser (eds.), 1–27. Cambridge, MA: MIT Press.

—— and Keyser, Samuel Jay (2002b). *Prolegomenon to a Theory of Argument Structure*. Cambridge, MA: MIT Press.

Halle, Morris and Marantz, Alec (1993). 'Distributed Morphology and the pieces of inflection'. In *The View from Building 20*, K. Hale and S. J. Keyser (eds.), 111–76. Cambridge, MA: MIT Press.

Hallman, Peter (2000). *The Structure of Predicates: Interactions of Derivation, Case, and Quantification*. PhD dissertation, UCLA.

Harley, Heidi (1995). *Subjects, Events and Licensing*. PhD dissertation, MIT.
—— (1999). 'Denominal verbs and aktionsart'. *MITWPL* 35: 73–86.
—— (2005). 'How do verbs get their names? Denominal verbs, manner incorporation, and the ontology of verb roots in English'. In *The Syntax of Aspect. Deriving Thematic and Aspectual Interpretation*, Tova Rapoport and Nomi Erteschik-Shir (eds.), 42–64. Oxford: Oxford University Press.
—— (2007). *External Arguments: on the Independence of* Voice *and* v. Paper presented at GLOW.
—— (this volume). 'The morphology of nominalizations and the syntax of *v*P'.
—— and Noyer, Rolf (1997). *Mixed Nominalizations, Short Verb Movement and Object Shift in English*. Paper presented at NELS.
—— and Noyer, Rolf (1999). 'State-of-the-article: Distributed Morphology'. *GLOT International* 4.4: 3–9.
—— and Noyer, Rolf (2000). 'Licensing in the non-lexicalist lexicon'. In *The Lexicon/Encyclopaedia Interface*, Bert Peeters (ed.), 349–74. Amsterdam: Elsevier Press.
Haspelmath, Martin (1997). *Indefinite Pronouns*. Oxford: Clarendon.
Hawkins, John (1994). *A Performance Theory of Order and Constituency*. Cambridge: Cambridge University Press.
Hazout, Ilan (1995). 'Action nominalizations and the lexicalist hypothesis'. *Natural Language and Linguistic Theory* 13: 355–404.
Heath, Jeff (1980). *Basic Materials in Ritharngu: Grammar, Texts, and Dictionary*. Canberra: Australian National University.
Heim, Irene (1982). *The Semantics of Definite and Indefinite Noun Phrases*. PhD dissertation, University of Massachusetts at Amherst.
—— (1987). 'Where does the definiteness restriction apply? Evidence from the definiteness of variables'. In *The Representation of (In)definiteness*, Eric Reuland and Alice G. B. ter Meulen (eds.), 21–42. Cambridge, MA: MIT Press.
—— (1991). 'Artikel und Definitheit'. In *Semantik: ein internationales Handbuch der zeitgenössischen Forschung*, Arnim von Stechow and Dieter Wunderlich (eds.), 487–535. Berlin.
—— (1994). 'Comments on Abusch's theory of tense'. Ms., MIT.
—— (2001). 'Degree Operators and Scope'. In *Audiatur Vox Sapientiae. A Festschrift for Arnim von Stechow*, Caroline Féry and Wolfgang Sternefeld (eds.), 214–39. Berlin: Akademie Verlag.
—— (2003). 'On quantifiers and NPIs in comparative clauses'. Talk given at Tübingen University.
—— (2004). 'Remarks on the negation theory of antonymy'. Ms., Tübingen.
—— and Kratzer, Angelika (1998). *Semantics in Generative Grammar*. Oxford: Blackwell.
Hendriks, Petra and Hoop, Helen de (2001). 'Optimality Theoretic Semantics'. *Linguistics and Philosophy* 24: 1–32.
—— et al. (2009). 'Conflicts in interpretation'. London: Equinox Publishing.
Herburger, Elena (1993). *Focus and the LF of NP Quantification*. Paper presented at SALT.

Heycock, Caroline and Zamparelli, Roberto (2003). 'Coordinated bare definites'. *Linguistic Inquiry* 34: 443–69.

—— and Zamparelli, Roberto (2005). 'Friends and colleagues: plurality, coordination, and the structure of DP'. *Natural Language Semantics* 13: 201–70.

Higginbotham, James (1987). 'Indefinites and predication'. In *The Representation of (In)definiteness*, Eric Reuland and Alice G. B. ter Meulen (eds.), 43–70. Cambridge, MA: MIT Press.

Hirawa, K. (2005). *Dimensions of Symmetry in Syntax: Agreement and Clausal Architecture*. PhD dissertation, MIT.

Hjelmslev, Louis (1935). *La Catégorie des Cas, I. Partie*. Aarhus: Universitetsforlaget.

Hoeksema, Jacob (1996). 'Introduction'. In *Partitives*, Jacob Hoeksema (ed.), 1–24. Berlin: Mouton de Gruyter.

Hoop, Helen de (1992). *Case Configuration and NP Interpretation*. PhD dissertation, University of Groningen.

—— (1995). 'On the characterization of the weak-strong distinction'. In *Quantification in Natural Language*, Emmon Bach et al. (eds.), 421–50. Dordrecht: Kluwer.

—— (1997). 'A semantic reanalysis of the partitivity constraint'. *Lingua* 103: 151–74.

—— (this volume). 'On (in)animate noun phrases'.

—— and Lamers, M. (2006). 'Incremental distinguishability of subject and object'. In *Case, Valency, and Transitivity*, Leonid Kulikov (ed.), Amsterdam: Benjamins.

—— and Malchukov, Andrej L. (2007). 'On fluid differential case marking: a bidirectional OT approach'. *Lingua* 117: 1636–56.

—— and Malchukov, Andrej L. (forthcoming). 'Case marking strategies'. *Linguistic Inquiry*.

Horn, Laurence (1984). 'Towards a new taxonomy for pragmatic inference: Q-based R-based implicatures'. In *Meaning, Form, and Use in Context*, Deborah Schiffrin (ed.), 11–42. Washington: Gergetown University Press.

—— (2005). '<the, a>: (In)definiteness, implicature and scalar pragmatics'. Ms., Yale University.

Hornstein, Norbert (1999). 'Movement and control'. *Linguistic Inquiry* 30: 69–96.

Horvath, Julia and Siloni, Tal (2008). 'Active lexicon: adjectival and verbal passives'. In *Generative Approaches to Hebrew Linguistics*, Sharon Armon-Lotem et al. (eds.), Amsterdam: Benjamins.

Hout, Angeliek van and Roeper, Thomas (1998). 'Events and aspectual structure in derivational morphology'. *MITWPL* 32: 175–200.

—— et al. (2008). 'Covert movement, reconstruction and Edge phenomena. Connecting English and Japanese nominalizations'. GAGL 46: 76–88.

Hron, David (2005). *On the Derivation of Czech Reflexive and Reciprocal Nouns*, MA thesis, Tel Aviv University.

Huang, Shi-Zhe (1996). *Quantification and Predication in Mandarin Chinese: A Case Study of* Dou. PhD dissertation, University of Pennsylvania.

—— (2005). *Universal Quantification with Skolemization as Evidenced in Chinese and English*. Lewiston, NY: Mellen.

Iordachioaia, Gianina and Soare, Elena (2007). *Two Kinds of Event Plurals: Evidence from Romanian Nominalizations*. Paper presented at CSSP 2007.
Jackendoff, Ray (1990). *Semantic Structures*. Cambridge, MA: MIT Press.
—— (1991). 'Parts and boundaries'. *Cognition* 41: 9–45.
—— (1997). *The Architecture of the Language Faculty*. Cambridge, MA: MIT Press.
—— (2002). *Foundations of Language*. New York: Oxford University Press.
Jacobsen, Wesley M. (1992). *The Transitive Structure of Events in Japanese*. Tokyo: Kurosio Publishers.
Jäger, Gerhard (2007). 'Evolutionary game theory and typology: a case study'. *Language* 83: 74 –109.
Jakobson, Roman (1936). 'Beitrag zur allgemeinen Kasuslehre'. *Travaux du Cercle Linguistique de Prague* 6: 240–88.
Jayaseelan, K. A. (2005). 'Comparative morphology of quantification'. Ms., Hyderabad.
Johnson, Kyle (1991). 'Object positions'. *Natural Language and Linguistic Theory* 9: 577–636.
—— (2000). 'Few dogs eat Whiskas or cats Alpo'. *University of Massachusetts Occasional Papers* 23: 59–82.
Jong, Franciska de (1983). 'Sommige Niet, Andere Wel; De Verklaring van een Raadselachtig Verschil'. *GLOT* 6: 229–46.
Kamiya, M. (2008). 'Two types of movements in Japanese nominalizations and edge phenomena'. *Linguistic Analysis 35. Special Issue on Phase Edge Investigations*, edited by K. Grohmann and Ph. Panagiotidis.
Kamp, Hans (1975). 'Two theories about adjectives'. In *Formal Semantics of Natural Language*, E. Keenan (ed.), 123–55. Cambridge: Cambridge University Press.
—— and Reyle, Uwe (1993). *From Discourse to Logic*. Dordrecht/London/Boston: Kluwer Academic Publisher.
Kang, Beom-Mo (1994). 'Plurality and other semantic aspects of common nouns in Korean'. *Journal of East Asian Linguistics* 3: 1–24.
Kaplan, David (1979). 'On the logic of demonstratives'. *Journal of Philosophical Logic* 8: 81–98.
Kawashima, Ruriko (1994). *The Structure of Noun Phrases and the Interpretation of Quantificational NPs in Japanese*. Doctoral dissertation, Cornell University, Ithaca.
—— (1998). 'The structure of extended nominal phrases: the scrambling of numerals, approximate numerals, and quantifiers in Japanese'. *Journal of East Asian Linguistics* 7: 1–26.
Kayne, Richard (1981). 'Unambiguous paths'. In *Levels of Syntactic Representation*, Robert May and J. Koster (eds.), 143–83. Dordrecht: Foris.
—— (1994). *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.
Keenan, Edward L. (1987). 'A semantic definition of "Indefinite NP" '. In *The Representation of (In)definiteness*, Eric J. Reuland and Alice ter Meulen (eds.), 286–317. Cambridge, MA: MIT Press.
—— (1996). 'The semantics of determiners'. In *The Handbook of Contemporary Semantic Theory*, Shalom Lappin (ed.), 41–65. Oxford: Blackwell.

Keenan, Edward L. (2003). 'The definiteness effect: semantics of pragmatics?' *Natural Language Semantics* 11: 187–216.

—— and Stavi, J. (1986). 'A semantic characterization of natural language determiners'. *Linguistics and Philosophy* 9: 253–326.

—— and Westerståhl, Dag (1997). 'Generalized quantifiers in linguistics and logic'. In *Handbook of Logic and Language*, Johan van Benthem and Alice ter Meulen (eds.), 837–94. Amsterdam: Elsevier.

Kennedy, Christopher (2001). 'Polar opposition and the ontology of "Degrees" '. *Linguistics and Philosophy* 24: 33–70.

Kiparsky, Paul (1982). *Word Formation and the Lexicon*. Paper presented at the Mid-America Linguistics Conference.

Kiss, Katalin É. (2002). *The Syntax of Hungarian*. Cambridge: Cambridge University Press.

Klein, Ewan (1980). 'A semantics for positive and comparative adjectives'. *Linguistics and Philosophy* 4: 1–45.

Klein, Wolfgang (1994). *Time in Language*. London and New York: Routledge.

Koizumi, Masatoshi (1993). 'Object agreement phrases and the split VP hypothesis'. *MITWPL* 18: 99–148.

Kolliakou, Dimitra (1995). *Definites and Possessives in Modern Greek: An HPSG Syntax for Noun Phrases*. PhD dissertation, University of Edinburgh.

Kratzer, Angelika (1993). 'On external arguments'. *University of Massachusetts (Amherst) Occasional Papers* 17: 103–30.

—— (1994). 'The event argument and the semantics of voice'. Ms., University of Massachusetts, Amherst.

—— (1996). 'Severing the external argument from its verb'. In *Phrase Structure and the Lexicon*, J. Rooryck and L. Zaring (eds.), 109–37. Dordrecht: Kluwer.

—— (1998a). *More Structural Analogies Between Pronouns and Tenses*. Paper presented at SALT 8, Cambridge, MA.

—— (1998b). 'Scope or pseudo-scope? Are there wide scope indefinites?' In *Events in Grammar*, Susan Rothstein (ed.), 163–96. Dordrecht: Kluwer.

—— (2004). *Covert Quantifier Domain Restrictions*. Paper presented at the Milan Meeting (Palazzo Feltrinelli, Gargnano).

—— (2005). 'Indefinites and the operators they depend on: from Japanese to Salish'. In *Reference and Quantification: The Partee Effect*, Gregory N. Carlson and F. Jeffry Pelletier (eds.), 113–42. Stanford: CSLI.

—— and Shimoyama, Junko (2002). 'Indeterminate pronouns, the view from Japanese'. Univeristy of Massachusetts, Amherst. Available at the semantics archive.

Krifka, Manfred (1989). *Nominalreferenz und Zeitkonstitution. Zur Semantik von Massentermen, Pluraltermen und Aspektklassen*. München: Wilhelm Fink Verlag.

—— (1992). 'Thematic relations as links between nominal reference and temporal constitution'. In *Lexical Matters*, Ivan Sag and Anna Szabolcsi (eds.), 29–53. Stanford: CSLI.

Krifka, Manfred (1995). 'Common nouns: A contrastive analysis of Chinese and English'. In *The Generic Book*, Gregory Carlson and F. Jeffry Pelletier (eds.), 398–411. Chicago: University of Chicago Press.

—— et al. (1995). 'Genericity: An introduction'. In *The Generic Book*, Greg Carlson and F. Jeffry Pelletier (eds.), 1–124. Chicago: University of Chicago Press.

Kuno, Susumo (1987). *Functional Syntax. Anaphora, Discourse and Empathy*. Chicago: University of Chicago Press.

—— and Kaburaki, E. (1977). 'Empathy and syntax'. *Linguistic Inquiry* 8: 627–72.

Laca, Brenda and Tasmowski, L. (1996). 'Indéfini et quantification'. *Recherches Linguistiques de Vincennes* 25: 107–28.

Ladusaw, William (1980). *Polarity Sensitivity as Inherent Scope Relations*. New York: Garland Publishing.

—— (1982). *Semantic Constraints on the English Partitive Construction*. Paper presented at WCCFL.

Laka, Itziar (1990). *Negation in Syntax: On the Nature of Functional Categories and Projections*. PhD dissertation, MIT.

Landau, Idan (2002). *A Typology of Psych Passives*. Paper presented at NELS.

Landman, Fred (2003). 'Predicate-argument mismatches and the adjectival theory of indefinites'. In *From NP to DP. Vol I: The Syntax and Semantics of Noun Phrases*, Martine Coene and Yves D'Hulst (eds.), 211–38. Amsterdam: Benjamins.

LaPolla, Randy J. and Huang, Chenglong (2003). *A Grammar of Qiang*. Berlin: Mouton de Gruyter.

Lasnik, Howard (1988). 'Subjects and the theta-criterion'. *Natural Language and Linguistic Theory* 6: 1–17.

—— (1999). 'On feature strength: Three minimalist approaches to overt movement'. *Linguistic Inquiry* 30: 197–217.

Lebeaux, David (1986). 'The interpretation of derived nominals'. In *CLS 22, Part 1. Papers from the Gerneral Session*, Anne M. Farley (ed.), 231–47. Chicago: Chicago Linguistic Society.

Lee, Thomas H.-K. (1986). *Studies on Quantification in Chinese*. PhD dissertation, UCLA.

Lees, Robert B. (1960). *The Grammar of English Nominalizations*. The Hague: Mouton de Gruyter.

Leonetti, Manuel (1999). 'El Artículo'. In *Gramática Descriptiva de la Lengua Española*, I. Bosque and V. Demonte (eds.), Madrid: Real Academia Española, Espasa Calpe.

Levin, Beth (2003). *Objecthood and Object Alternations*. Paper presented at UCLA.

—— (2006). *Dative Verbs: a Cross-Linguistic Perspective*. Paper presented at the Lexis and Grammar Conference, Palermo, Italy.

Levinson, Stephen (2001). *Presumptive Meanings*. Cambridge, MA: MIT Press.

Lewis, David (1972). 'General semantics'. *Synthese* 22: 18–67.

—— (1975). 'Adverbs of quantification'. In *Formal Semantics of Natural Language*, E. Keenan (ed.), 3–15. Cambridge: Cambridge University Press.

Lin, Jo-Wang (1996). *Polarity Licensing and Wh-phrase Quantification in Chinese*. PhD dissertation, University of Massachusetts at Amherst.

—— (1998). 'Distributivity in Chinese and its implications'. *Natural Language Semantics* 6: 201–43.

Lin, Tzong-Hong (1998). 'On *ge* and other related problems'. In *The Referential Properties of Chinese Noun Phrases*, Liejiong Xu (ed.), 209–53. Paris: Ecole des Hautes Etudes en Sciences Sociales.

Link, Godehard (1983). 'The logical analysis of plurals and mass terms: a lattice-theoretical approach'. In *Meaning, Use, and Interpretation of Language*, Rainer Bäuerle et al. (eds.), 302–23. Berlin: Mouton de Gruyter.

Liu, Fong-hsi (1990). *Scope Dependency in English and Chinese*. PhD dissertation, UCLA.

Lü, Shu-xiang (1980). *Xian-dai hanyu ba-bai ci (800 words of Modern Chinese)*. Hong Kong: Shang-Wu Publisher.

Lumsden, M. (1988). *Existential Sentences: Their Structure and Meaning*. London: Routledge.

Maienborn, Claudia (2002). *Die logische Form von Kopula-Sätzen*. Berlin: Akademie.

Malchukov, Andrej L. (1993). 'Adversative constructions in Even in relation to passive and permissive'. In *Causatives and Transitivity*, Bernard Comrie and Maria Polinsky (eds.), Amsterdam: Benjamins.

Malikouti-Drachman, A. and Drachman, G. (1995). 'Prosodic circumscription and Optimality Theory'. *Studies in Greek Linguistics* 1994: 143–61.

Malouf, Robert P. (2000). *Mixed Categories in the Hierarchical Lexicon*. Stanford: CSLI Publications.

Manterola, J. (2006). '-a euskal artikulu definituaren gainean zenbait ohar'. In *Studies in Basque and Historical Linguistics in Memory of R. L. Trask*, J. A. Lakarra and J. I. Hualde (eds.), 651–76. Donostia-Bilbo: Gipuzkoako Foru Aldundia-EHU.

Marantz, Alec (1997). 'No escape from syntax: don't try morphological analysis in the privacy of your own lexicon'. In *University of Pennsylvania Working Papers in Linguistics*, A. Dimitriadis et al. (eds.), 201–25. Philadelphia: University of Pennsylvania.

—— 2000. 'Reconstructing the lexical domain with a single generative engine'. Ms., MIT.

—— (2001a). *Words and Things*. Paper presented at MIT.

—— (2001b). *Words*. Paper presented at WCCFL, UCLA.

—— (2005). '*Objects out of the lexicon: objects as events*'. Talk given at Vienna University.

Marelj, Marijana (2004). *Middles and Argument Structure Across Languages*. PhD dissertation, Utrecht: Netherlands Graduate School of Linguistics (LOT).

Markantonatou, Stella (1992). *The Syntax of Modern Greek Noun Phrases with a Derived Nominal Head*. PhD dissertation, University of Essex.

Martí, Luisa (2003). *Contextual Variables*. MIT: MIT Working Papers in Linguistics Dissertation Series.

Martí, Luisa (2008). 'The semantics of plural indefinite noun phrases in Spanish and Portuguese'. *Natural Language Semantics*, 16, 1: 1–37.

—— (this volume). 'Contextual restrictions on indefinites: Spanish *algunos* vs. *unos*'.

Matthewson, Lisa (1998). *Determiner Systems and Quantificational Strategies: Evidence from Salish*. The Hague: Holland Academic Graphics.

—— (1999). 'On the interpretation of wide-scope indefinites'. *Natural Language Semantics* 7: 79–134.

—— (2001). 'Quantification and the nature of crosslinguistic variation'. *Natural Language Semantics* 9: 145–89.

—— (2004). 'On the methodology of semantic fieldwork'. *International Journal of American Linguistics* 70: 369–415.

—— (2005). *When I Was Small – I Wan Kwikws: Grammatical Analysis of St'át'imc Oral Narratives*. Vancouver: UBC Press.

—— (2006). *Presuppositions and Cross-Linguistic Variation*. Paper presented at NELS.

—— (this volume). 'An unfamiliar proportional quantifier'.

—— (to appear). 'Strategies of quantification, revisited'. In *Strategies of Quantification*, Kook-Hee Gil and George Tsoulas (eds.), Oxford: Oxford University Press.

McNally, Louise (1992). *An Interpretation for the English Existential Construction.* PhD dissertation, University of California Santa Cruz.

—— (1995). 'Bare plurals in Spanish are interpreted as properties'. In *Formal Grammar*, Glyn Morrill and Richard Oehrle (eds.), 197–212. Reprinted 2004 in *Catalan Journal of Linguistics* 3: 115–33.

—— (1997). *A Semantics for the English Existential Construction*. New York: Garland Publishing.

—— (1998). 'Existential sentences without existential quantification'. *Linguistics and Philosophy* 21: 353–92.

—— (2008). 'DP-internal *only*, amount relatives, and relatives out of existentials'. *Linguistic Inquiry* 39, 1: 161–9.

—— (this volume). 'Properties, entity correlates of properties, and existentials'.

—— and van Geenhoven, Veerle (1998). *Redefining the Weak/Strong Distinction*. Paper presented at CSSP.

Meier, Cécile (2003a). 'The meaning of *Too*, *Enough*, and *So That*'. *Natural Language Semantics* 11: 69–107.

—— (2003b). *Theories of Comparison*. Paper presented at ESSLLI.

Meltzer, Aya (2005). *Adjectival Passives and Adjectival Decausatives*. MA thesis, Tel Aviv University.

Merchant, Jason (2006). *On the Identity Conditions in Ellipsis: Evidence from Voice Mismatches and Islands in VPE, Sluicing, and Comparatives*. Paper presented at the Ellipsis workshop, University of Stuttgart, Germany.

—— (2007). 'Voice and ellipsis'. Ms., University of Chicago. http://home.uchicago.edu/~merchant/pubs/voice.and.ellipsis.pdf.

Milsark, G. (1979). *Existential Sentences in English*. New York: Garland Publishing.

Mirambel, A. (1958). *La langue grecque moderne: description et analyse*. Paris: Klincksieck.

Mithun, Marianne (1991). 'Active/agentive case marking and its motivations'. *Language* 67: 510–46.

Miyagawa, Shigeru (1989). *Structure and Case Marking in Japanese*. New York: Academic Press.

Mohanan, T. (1990). *Arguments in Hindi*. Doctoral dissertation, Stanford University.

Montague, Richard (1973). 'The proper treatment of quantification in ordinary English'. In *Approaches to Natural Language*, Jaakko Hintikka et al. (eds.), 221–42. Dordrecht: Reidel.

—— (1974). 'The proper treatment of quantification in English'. Formal Philosophy. Selected Papers of Richard Montague. 247–70. New Haven/London: Yale University Press.

Mourelatos, Alexander (1978). 'Events, processes and states'. *Linguistics and Philosophy* 2: 415–34.

Müller-Reichau, O. (2005). *A Kinds-based DRT Approach to the Semantics of Articles across Languages*. Paper presented at the Workshop on Formal Semantics and Cross-linguistic Data, ESSLLI 2005, Edinburgh.

Musan, Renate (1995). *On the Temporal Interpretation of Noun Phrases*. PhD dissertation, MIT.

Neale, Stephen (1990). *Descriptions*. Cambridge, MA: MIT Press.

Newmeyer, Frederick J. (to appear). 'Current challenges to the lexicalist hypothesis: an overview and a critique'. In *Language: Theory and Practice. Papers in Honor of D. Terence Langendoen*, Simin Karimi et al. (eds.), Amsterdam: Benjamins.

Nilsen, Øystein (2004). 'Domains for adverbs'. *Lingua* 114: 809–47.

Nishigauchi, Taisuke (1990). *Quantification in the Theory of Grammar*. Dordrecht: Kluwer.

Nunberg, Geoffrey (1979). 'The non-uniqueness of semantic solutions: polysemy'. *Linguistics and Philosophy* 3: 143–84.

Ojeda, Almerindo E. (1993). *Linguistic Individuals*. Stanford: CSLI.

Ortiz de Urbina, J. (1989). *Parameters in the Grammar of Basque*. Dordrecht: Foris.

Partee, Barbara (1987). 'Noun phrase interpretation and type-shifting principles'. In *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*, Jeroen Groenendijk et al. (eds.), 115–43, Dordrecht: Foris.

—— (1988). 'Many quantifiers'. *ESCOL* 5: 383–401.

Pelletier, Francis Jeffry and Schubert, Lenhart K. (1989). 'Mass expressions'. In *Handbook of Philosophical Logic, Vol. IV*, Dov M. Gabbay and F. Guenthner (eds.), 327–408. Dordrecht: Kluwer.

Pencheva, Maya (1992). 'Semantic 'oppositions': (animacy)'. In *Current Advances in Semantic Theory*, Maxim Stamenov (ed.), 339–46. Amsterdam: Benjamins.

Pesetsky, David (1995). *Zero Syntax. Experiencers and Cascades*. Cambridge, MA: MIT Press.

—— (2000). *Phrasal Movement and Its Kin*. Cambridge, MA: MIT Press.

Picallo, M. Carme (1991). 'Nominals and nominalizations in Catalan'. *Probus* 3: 279–316.

Pirani, Laura (2007). *Morphological Processes in the Mandarin Nominal Domain*. PhD dissertation, University of Verona.

Poesio, Massimo and Vieira, R. (1998). 'A corpus-based investigation of definite description use'. *Computational Linguistics* 24: 183–216.

Postal, Paul (1974). *On Raising*. Cambridge, MA: MIT Press.

Prince, Ellen (1981). 'Toward a taxonomy of given/new information'. In *Radical Pragmatics*, Peter Cole (ed.), 223–55. New York: Academic Press.

—— (1988). 'The discourse function of Yiddish expletive ES and subject post-posing'. *IPRA Paper in Pragmatics* 2: 176–94.

—— (1992). 'The ZPG letter: subjects, definiteness, and information-status'. In *Discourse Description: Diverse Linguistic Analyses of a Fund-Raising Text*, Sandra A. Thompson and William C. Mann (eds.), 295–325. Amsterdam: Benjamins.

Pustejovsky, James (1995). *The Generative Lexikon*. Cambridge, MA: MIT Press.

Pylkkänen, Liina (2002). *Introducing Arguments*. Cambridge, MA: MIT Working Papers.

Ralli, A. (1988). *Eléments de la Morphologie du Grec Moderne*. PhD dissertation, University of Montreal.

Ramchand, Gillian (2008). *Verb Meaning and the Lexicon: a First Phase Syntax*. Cambridge: Cambridge University Press.

—— and Svenonius, Peter (2002). *The Lexical Syntax and Lexical Semantics of the Verb-Particle Construction*. Paper presented at WCCFL.

Randall, Janet (1982). *Morphological Structure and Language Acquisition*. PhD dissertation, University of Massachusetts, Amherst.

Rathert, Monika (2008). *Deverbale Nominalisierungen im Deutschen und Englischen. Morphosyntax und empirische Untersuchungen*, Universität Frankfurt/M.: Habilitationsschrift.

Recanati, François (1996). 'Domains of discourse'. *Linguistics and Philosophy* 19: 445–75.

—— (2004). ' "That"-clauses as existential quantifiers'. *Analysis* 64: 229–34.

Reinhart, Tanya (1997). 'Quantifier scope: how labor is divided between QR and choice functions'. *Linguistics and Philosophy* 20: 335–97.

—— (2001). *Experiencing Derivations*. Paper presented at SALT.

—— (2002). 'The theta system – an overview'. *Theoretical Linguistics* 28: 229–90.

—— and Siloni, Tal (2005). 'The lexicon-syntax parameter: reflexivization and other arity operations'. *Linguistic Inquiry* 36: 389–436.

Roeper, Thomas (1987). 'Implicit arguments and the head-complement relation'. *Linguistic Inquiry* 18: 267–310.

—— (1993). 'Explicit syntax in the lexicon: the representation of nominalizations'. In *Semantics and the Lexicon*, James Pustejovsky (ed.), 185–220. Dordrecht: Kluwer.

—— (2000). 'Inherent binding and the syntax-lexicon interface'. In *Lexical Specification and Insertion*, Peter Coopmans et al. (eds.), 305–28. Amsterdam: Benjamins.

Roeper, Thomas (2005). 'Chomsky's remarks and the transformationalist hypothesis'. In *The Handbook of English Word Formation*, Pavol Stekauer and Rochelle Lieber (eds.), 125–46. Dordrecht: Kluwer.

—— and Siegel, Muffy (1978). 'A lexical transformation for verbal compounds'. *Linguistic Inquiry* 9: 197–269.

—— and van Hout, Angeliek (1999). 'The impact of nominalization on passive, -able and middle: Burzio's generalization and feature-movement in the lexicon'. *MITWPL* 35: 185–211.

—— and van Hout, Angeliek (this volume). 'The representation of movement in *-ability* nominalizations. Evidence for covert category movement, Edge phenomena, and local LF'.

Roodenburg, J. (2006). *On the Existence of Plural Event Nominalizations: a View from Romance*. Paper presented at NELS.

Rosen, S. T. (1999). 'The syntactic representation of linguistic events. A state-of-the-article'. *GLOT* 4: 3–10.

Roßdeutscher, Antje (2007). 'Resultatslesarten und modulare Repräsentation'. Ms., University of Stuttgart.

Russell, Bertrand (1905). 'On denoting'. *Mind* 14: 479–93.

Sauerland, Uli et al. (2005). 'The plural is semantically unmarked'. In *Linguistic Evidence*, Stephan Kepser and Marga Reis (eds.), 413–34. Berlin: Mouton de Gruyter.

Sawai, Naomi (1997). *An Event Structure Analysis of Derived Verbs in English*. Master's thesis, University of Calgary.

Schwarzschild, Roger (1996). *Pluralities*. Dordrecht: Kluwer.

—— (2002). 'Singleton indefinites'. *Journal of Semantics* 19: 289–314.

—— (2004). 'Scope splitting in the comparative'. Ms., MIT Colloquium.

—— and Wilkinson, Karina (2002). 'Quantifiers in comparatives: A semantics of degree based on Intervals'. *Natural Language Semantics* 10: 1–41.

Scott, Graham K. (1978). *The Fore language of Papua New Guinea*. Canberra: Pacific Linguistics.

Sharvy, Richard (1978). 'Maybe English has no count nouns: notes on Chinese semantics'. *Studies in Language* 2: 345–65.

Shimoyama, Junko (2001). *Wh-constructions in Japanese*. Doctoral dissertation, University of Massachussetts, Amherst.

Sichel, Ivy (2007). *Agent Exclusivity in Nominalization*. Paper presented at the Workshop on bare nouns and nominalizations, Stuttgart.

Siegel, Laura (1997). *Gerundive Nominals and the Role of Aspect*. Paper presented at ESCOL, available at http://www.ling.upenn.edu/~lsiegel/escolrev.pdf.

Siloni, Tal (1997). *Noun Phrases and Nominalizations: the Syntax of DPs*. Dordrecht: Kluwer.

—— (2002). 'Active lexicon'. *Theoretical Linguistics* 28: 383–400.

—— (2008). 'The syntax of reciprocal verbs: an overview'. In *Reciprocals and Reflexives: Cross-linguistic and Theoretical Implications*, Ekkehard König and Volker Gast (eds.), Berlin: Mouton de Gruyter.

Siloni, Tal and Preminger, Omer (this volume). 'Nominal voices'.
Silverstein, M. (1976). 'Hierarchy of features and ergativity'. In *Grammatical Categories in Australian languages*, Robert Malcolm W. Dixon (ed.), 112–71. Canberra: Australian Institute for Aboriginal Studies.
Smith, Carlota (1972). 'On causative verbs and derived nominals in English'. *Linguistic Inquiry* 3: 36–8.
Spector, Benjamin (2007). 'Aspects of the pragmatics of plural morphology: on higher-order implicatures'. In *Presupposition and Implicature In Compositional Semantics*, Ulrich Sauerland and Penka Stateva (eds.), 243–81. Basingstoke: Palgrave Macmillan.
Sportiche, Dominique (1997). *Reconstruction and Constituent Structure*. Paper presented at MIT, October 1997.
—— (2001). 'Reconstruction, binding and scope'. Ms., UCLA.
Stanley, Jason (2002). 'Nominal restriction'. In *Logical Form and Language*, G. Peters and G. Preyer (eds.), 365–88. Oxford: Oxford University Press.
—— and Szabó, Zoltan (2000). 'On quantifier domain restriction'. *Mind and Language* 15: 219–61.
Stechow, Arnim von (1984a). 'Comparing semantic theories of comparison'. *Journal of Semantics* 3: 1–77.
—— (1984b). 'My reaction to Cresswell's, Hellan's, Hoeksema's and Seuren's comments'. *Journal of Semantics* 3: 183–99.
—— (1996). 'Against LF pied-piping'. *Natural Language Semantics* 4: 57–110.
Stowell, Timothy (1981). *Origins of Phrase Structure*. PhD dissertation, MIT.
Strawson, Peter F. (1950). 'On referring'. *Mind* 59: 320–44.
—— (1959). *Individuals: An essay in Descriptive Metaphysics*. London: Routledge.
Svenonius, Peter (2004). 'On the Edge'. In *Peripheries: Syntactic Edges and their Effects*, David Adger et al. (eds.), 259–87. Dordrecht: Kluwer.
Swart, Henriëtte de (1991). *Adverbs of Quantification: A Generalized Quantifier Approach*. PhD dissertation, University of Groningen.
—— (1996). '(In)definites and genericity'. In *Quantifiers, Deduction and Context*, Makoto Kanazawa et al. (eds.), 171–94. Stanford: CSLI.
—— (2001). 'Weak readings of indefinites: type-shifting and closure'. *The Linguistic Review* 18: 69–96.
—— (2006). 'Aspectual implications of the semantics of indefinite plurals'. In *Indefiniteness and Plurality*, L. Tasmowski and S. Vogeleer (eds.), 161–89. Amsterdam: Benjamins.
—— and Farkas, Donka (2005). 'Généricité et indéfinitude. Une analyse dans la théorie de l'optimalité'. In *Noms nus et généricité*, Carmen Dobrovie-Sorin (ed.), 98–126. Paris: Presses Universitaires de Vincennes.
—— and Zwarts, Joost (2008). 'Less form, more meaning: why bare nominals are special'. *Lingua* (in press).
Swart, Peter de (2007). *Cross-linguistic Variation in Object Marking*. Doctoral dissertation, Radboud University Nijmegen.

Swart, Peter de and Hoop, Helen de (2007). 'Semantic aspects of differential object marking'. In *Proceedings of Sinn und Bedeutung*, E. Puig-Waldmüller (ed.), 568–81. Barcelona: universitat Pompeu Fabra.

Sybesma, Rint (2007). '北方方言和粵語中名詞的可數標記Beifang fangyan he Yueyu zhong mingci de keshubiaoji' ('Markers of countability on the noun in Mandarin and Cantonese'). *Yuyánxué lùncong* 35.

Szabolcsi, Anna (1994). 'The noun phrase'. In *The Syntactic Structure of Hungarian*, Ferenc Kiefer and Katalin É. Kiss (eds.), 179–274. New York: Academic Press.

Tanaka, M. et al. (2005). *The Role of Animacy in Japanese Sentence Production*. Paper presented at the Animacy workshop, May 2005, Radboud University Nijmegen.

Tancredi, Christopher and Yamashina, Miyuki (2004). *The Interpretation of Indefinites in the Japanese* wh-mo *Construction*. Paper presented at the *Strategies of Quantification* Conference, University of York.

Tang, Jane (1990). 'A note on the DP analysis of Chinese noun phrases'. *Linguistics* 28: 337–54.

Tomioka, Satoshi and Nakanishi, Kimiko (2004). 'Japanese plurals are exceptional'. *Journal of East Asian Linguistics* 13: 113–40.

Tomlin, Russell S. (1986). *Basic Word Order: Functional Principles*. London: Croom Helm.

Trask, L. (2003). 'The noun phrase: nouns, determiners, and modifiers; pronouns and names'. In *A Grammar of Basque*, J. I. Hualde and J. Ortiz de Urbina (eds.), 92–134. Dordrecht: Kluwer.

Travis, Lisa (to appear). *Inner Aspect*. To be published by Elsevier. Ms. available at http://www.arts.mcgill.ca/programs/linguistics/faculty/travis/publications.htm.

Tsoulas, George (2003). 'Floating quantifiers as overt scope markers'. *Korean Journal of English Language and Linguistics* 3: 157–80.

—— (2005). 'Does Greek have a plural? The grammar of number and the mass–count distinction in Greek'. Ms., University of York.

Vallduví, Enric (1993). *The Informational Component*. PhD dissertation, University of Pennsylvania.

Vendler, Zeno (1967). *Linguistics and Philosophy*. Ithaca, NY: Cornell University Press.

Verkuyl, Henk (1993). *A Theory of Aspectuality. The Interaction between Temporal and Atemporal Structure*. Cambridge: Cambridge University Press.

Villalta, Elisabeth (1994). 'Plural indefinites in Spanish and distributivity'. Ms., CNRS.

Ward, Gregory and Birner, Betty (1995). 'Definiteness and the English existential'. *Language* 71: 722–42.

Wasow, Thomas and Roeper, Thomas (1972). 'On the subject of gerunds'. *Foundations of Language* 8: 44–61.

Watanabe, Akira (2006). 'Functional projections of nominals in Japanese: syntax of classifiers'. *Natural Language and Linguistic Theory* 24: 241–306.

Weckerly, Jill and Kutas, Marta (1999). 'An electrophysiological analysis of animacy effects in the processing of object relative sentences'. *Psychophysiology* 36: 559–70.

Westerståhl, Dag (1985a). 'Determiners and context sets'. In *Generalized Quantifiers in Natural Language*, Johan van Benthem and Alice ter Meulen (eds.), 45–71. Dordrecht: Foris.

—— (1985b). 'Logical constants in quantifier languages'. *Linguistics and Philosophy* 8: 387–413.

Whitman, John (2001). KAYNE 1994: P. 143, FN. 3. In *The Minimalist Parameter: Selected Papers from the Open Linguistics Forum, Ottawa, 21–23 March 1997*, Galina M. Alexandrova and Olga Arnaudova (eds.), 77–100. Amsterdam: Benjamins.

Williams, Edwin (1994). *Thematic Structure in Syntax*. Cambridge, MA: MIT Press.

Wunderlich, Dieter (1997). '*Cause* and the structure of verbs'. *Linguistic Inquiry* 28: 27–68.

Yamamoto, Mutsumi (1999). *Animacy and Reference: a Cognitive Approach to Corpus Linguistics*. Amsterdam: Benjamins.

Yamashita, H. and Chang, F. (2001). ' "Long before short" preference in the production of a head-final language'. *Cognition* 81: 1345–55.

Yang, Kai Rong (2004). 'Liang-ci congdie jushi yu "mei" jushi zai yuyi gongneng ji jufa shang de xiangtong'. ('The similarity between the meaning and structural difference between sentences with classifier reduplication and *mei*'). *Contemporary Research in Modern Chinese* 2004: 1–8.

Yang, Xue Mei (2002). ' "ge-ge", "mei-ge" he "yi-ge (yi)ge" de yufa yuji fenxi'. ('The syntactic and semantic analysis of *ge-ge*, *mei-ge*, and *yige (yi)ge*'). *Chinese Language Learning* 4: 26–31.

Zucchi, Alessandro (1995). 'The ingredients of definiteness and the definiteness effect'. *Natural Language Semantics*. 3: 33–78.

Zwarts, Frans (1986). *Categoriale grammatica en algebraische semantiek*, PhD dissertation, University of Groningen.

Index

OXFORD STUDIES IN THEORETICAL LINGUISTICS

PUBLISHED

1 *The Syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*
by Jason Merchant

2 *Questions and Answers in Embedded Contexts*
by Utpal Lahiri

3 *Phonetics, Phonology, and Cognition*
edited by Jacques Durand and Bernard Laks

4 *At the Syntax-Pragmatics Interface: Concept Formation and Verbal Underspecification in Dynamic Syntax*
by Lutz Marten

5 *The Unaccusativity Puzzle: Explorations of the Syntax-Lexicon Interface*
edited by Artemis Alexiadou, Elena Anagnostopoulou, and Martin Everaert

6 *Beyond Morphology: Interface Conditions on Word Formation*
by Peter Ackema and Ad Neeleman

7 *The Logic of Conventional Implicatures*
by Christopher Potts

8 *Paradigms of Phonological Theory*
edited by Laura Downing, T. Alan Hall, and Renate Raffelsiefen

9 *The Verbal Complex in Romance*
by Paola Monachesi

10 *The Syntax of Aspect: Deriving Thematic and Aspectual Interpretation*
edited by Nomi Erteschik-Shir and Tova Rapoport

11 *Aspects of the Theory of Clitics*
by Stephen Anderson

12 *Canonical Forms in Prosodic Morphology*
by Laura J. Downing

13 *Aspect and Reference Time*
by Olga Borik

14 *Direct Compositionality*
edited by Chris Barker and Pauline Jacobson

15 *A Natural History of Infixation*
by Alan C. L. Yu

16 *Phi-Theory: Phi-Features Across Interfaces and Modules*
edited by Daniel Harbour, David Adger, and Susana Béjar

17 *French Dislocation: Interpretation, Syntax, Acquisition*
by Cécile De Cat

18 *Inflectional Identity*
edited by Asaf Bachrach and Andrew Nevins

19 *Lexical Plurals*
by Paolo Acquaviva

20 *Adverbs and Adjectives: Syntax, Semantics, and Discourse*
edited by Louise McNally and Christopher Kennedy

21 *InterPhases: Phase-Theoretic Investigations of Linguistic Interfaces*
edited by Kleanthes Grohmann

22 *Negation in Gapping*
by Sophie Repp

23 *A Derivational Syntax for Information Structure*
by Luis López

24 *Quantification, Definiteness, and Nominalization*
edited by Anastasia Giannakidou and Monika Rathert

PUBLISHED IN ASSOCIATION WITH THE SERIES

The Oxford Handbook of Linguistic Interfaces
edited by Gillian Ramchand and Charles Reiss

IN PREPARATION

The Logic of Pronominal Resumption
by Ash Asudeh

Phi Syntax: A Theory of Agreement
by Susana Béjar

Phonology in Phonetics
by Abigail Cohn

The Sound Patterns of Syntax
edited by Nomi Erteschik-Shir and Lisa Rochman

Tense, Aspect, and Indexicality
by James Higginbotham

Syntax, Lexical Semantics, and Event Structure
edited by Malka Rappoport Hovav, Edit Doron, and Ivy Sichel

The Syntax of Sentential Stress
by Arsalan Kahnemuyipour

Conditionals
by Angelika Kratzer

A Derivational Syntax for Information Structure
by Luis López

The Ecology of English Noun-Noun Compounding
by Ray Jackendoff

Stratal Optimality Theory
by Ricardo Bermúdez Otero

Negation in Gapping
by Sophie Repp

Computing Optimality
by Jason Riggle

Noverbal Predications
by Isabelle Roy

Null Subject Languages
by Evi Sifaki and Ioanna Sitaridou

Gradience in Split Intransitivity
by Antonella Sorace