

CROSSLINGUISTIC PERSPECTIVES ON ARGUMENT STRUCTURE

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CHAPTER 2

A Person, a Place, or a Thing? Whorfian Consequences of Syntactic Bootstrapping in Mopan Maya

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I. INTRODUCTION

When Semitic, Chinese, Tibetan, or African languages are contrasted with our own, the divergence in analysis of the world becomes more apparent; and, when we bring in the native languages of the Americas, where speech communities for many millennia have gone their ways independently of each other and of the Old World, the fact that languages dissect nature in many different ways becomes patent. The relativity of all conceptual systems, ours included, and their dependence on language stand revealed. (Whorf, 1940/1956: 214)

Over the last half-century, a compelling argument from child language has played a crucial role in discrediting claims for linguistic relativity such as this one. It is claimed (Chomsky, 1975) that the detailed structures of human languages are logically unlearnable under the conditions in which normal human children in fact routinely do acquire fluency in their native language (Bowerman, 1988). If the most important grammatical structures cannot in fact be learned, but are nevertheless undoubtedly acquired, it follows that the central facts of human language must be available to the child innately. And if this is so, it is easy to see that languages all over the world must be, at some deep level, and appearances sometimes to the contrary, fundamentally similar to one another. Whorf and his companion proponents of linguistic relativity were, it seems, just plain wrong.

Even with a universal grammar to rely on, however, some problems in accounting for child language acquisition remain. For example, if we ask how children know the meanings of words in their language, we may well suppose that part of this knowledge is a matter of innate access to universal syntactic categories and functions, but we must

still ask, for example, how English children pair the particular phonology /rən/ with the English concept RUN (Gleitman, 1990).¹ Since phonological forms clearly differ across languages, innateness can be only part of the answer here. "Bootstrapping" solutions to this problem propose that a universal and innate linkage exists between the meanings of lexical items and the syntactic form classes to which they belong. This linkage is crucial in allowing children to match phonological strings with the appropriate meanings and functions in their native languages. Bootstrappers suggest (Pinker, 1987, 1988, 1989, 1994) that, in any language, if a linguistic form refers to a Concrete Object, then it will function syntactically as a daughter node of an NP, falling into the familiar and universal form class "Noun." Names for Actions or Changes of State will in their turn be universally linked to the form class "Verb," which itself is defined by its syntactic privileges of occurrence as a VP daughter. Finally (at least in early versions; cf. Pinker, 1987: 406), "Names for Attributes" will be linked to the universal syntactic class "Adjective." Once again, Whorf could not have been more wrong. Immediately following the stirring manifesto already quoted, Whorf continues:

Let us consider a few examples. In English we divide most of our words into two classes, which have different grammatical and logical properties. Class 1 we call nouns, e.g., 'house, man'; class 2, verbs, e.g., 'hit, run'.... Our language thus gives us a bipolar division of nature. But nature herself is not thus polarized. If it be said that 'strike, turn, run' are verbs because they denote temporary or short-lasting events, i.e., actions, why then is 'fist' a noun? It also is a temporary event. Why are 'lightning, spark, wave, eddy, pulsation, flame, storm, phase, cycle, spasm, noise, emotion' nouns? They are temporary events. If 'man' and 'house' are nouns because they are long-lasting and stable events, i.e., things, what then are 'keep, adhere, extend, project, continue, persist, grow, dwell,' and so on doing among the verbs? If it be objected that 'possess, adhere' are verbs because they are stable relationships rather than stable percepts, why then should 'equilibrium, pressure, current, peace, group, nation, society, tribe, sister', or any kinship term be among the nouns?

Whorf argues here that speakers do not derive their sense that a particular experience has the properties of an Action, say, rather than those of an Object, from its inherent nature. Rather, speakers treat an experience as having an inherent Action component *just because* it is treated syntactically as a Verb in their language.

But examples like these of Whorf's are readily accounted for under current theories of a universal syntax-semantics link in the lexicon. Naturally, says the current theory, in every language and in all syntactic classes we can expect that there will be found many semantically anomalous items. There may well be forms referring to non-Concrete non-Objects in the Noun class, for example (cf. the English abstract Nouns). These will be learned by children by semantic extension from the core members of each category. What is crucial for the universal syntax-semantics linkage is simply that linguistic items that do refer to genuine Concrete Objects should not fail to function as syntactic Nouns, and that those referring to clear-cut Actions should not fail to function as syntactic Verbs. In addition, it is important to recognize that form class *derivation* is an active process across languages; the underived

lexical root must conform to the universal linkage (e.g., English *run* encodes an Action Concept and should therefore be a Verb, but *runner*, visibly derived from *run* by the addition of extra morphology, is under no such constraint).

2. HOW BOOTSTRAPPING WORKS

Bootstrappers differ among themselves in their views as to exactly how the child first comes to understand that a certain phonological string indeed refers to an Action, say, and not to a Concrete Object. Under semantic bootstrapping, Pinker (1987, 1988, 1989, 1994) proposes that experiential phenomena (such as, for example, what it means to HIT or to RUN, or to find oneself in the presence of a HORSE, HOUSE, or MAN) appear to all of us in universally similar ways, complete with attendant subsidiary semantics of the type 'Concrete Object' or 'Action'. Children learn to associate word-length phonological strings with these straightforward nonlinguistic experiences, and from there it is a short step, via the universal syntax-semantics linkage, into the acquisition of native language syntax.

But certainly Quine (1969) has been famously at pains to point out the logical difficulties of imagining that the referents of words are unambiguously available from context. Gleitman (1990) offers similar arguments why starting with naive appreciation of real-world semantics is implausible from a learnability point of view. In essence, any linguistic reference to even the most mundane real-world scene offers multiple possibilities of interpretation. Is the speaker interpreting the scene with reference to the Concrete Objects that are present, or to the Actions? How, in short, does the child determine "that it is the phonological object /run/, not /horse/ or /marathoner/—that is to be mapped onto the action concept" (Gleitman, 1990: 4)?

Brown (1957) had early shown that young children will use syntactic information in order to approach the meaning of a novel word.² The hypothesis of syntactic bootstrapping (Gleitman, 1990) follows up on these findings to take the radical and interesting step of proposing that children use their innate knowledge of the universal mapping between syntax and semantics in order to deduce semantic meaning from syntactic occurrence, as well as the other way around. According to syntactic bootstrapping, a young child may know more about the syntax of a given phonological string (Aha! There goes a Verb!) than about its semantics. But thanks to the universal syntax-semantics linkage, children can begin to acquire increasingly precise refinements of lexical meaning by reasoning from the syntactic and morphological position in which each string routinely occurs. In a convincing illustration, Gleitman (1990: 5) shows how a great deal of the semantic distinction between the English verbs *to see* and *to look* lies simply in their "syntactic privileges of occurrence" in an actual corpus. The verb *to see* always takes two arguments (Subject and Object; it is a Transitive Verb), whereas the verb *to look* always takes only one (the Subject; it is an Intransitive Verb). Says Gleitman (1990: 27), "The range of subcategorization frames has considerable potential for partitioning the verb set

semantically, and...language learners have the capacity and inclination to recruit this information to redress the insufficiencies of observation."

A final refinement (Fisher, Hall, Rakowitz, & Gleitman, 1994; Maratsos, 1990) proposes that although the meanings of Verbs are acquired through syntactic bootstrapping, perhaps the meanings of Nouns are indeed acquired through semantic bootstrapping from self-evident experience with Concrete Objects. This of course merely re-poses much of the original problem. For how is the child to know which phonological strings are to count as Nouns and which are not? For many theorists, the answer once again places syntax before semantics (cf. Gleitman, 1990: 41–42). Quine notwithstanding, other theorists (Maratsos, 1990; see also Gentner, 1982; Gentner & Boroditsky, 2001) meanwhile continue to argue that Concrete Object semantics are especially apparent to young children and that Nouns are distilled from the input data on this basis, perhaps leaving the rest to be acquired according to syntactic occurrence.

Regardless of the preferred variant, however, it is well understood that all bootstrapping theories of lexical acquisition depend absolutely on the postulate that there exists a natural link between semantic meaning and syntactic function in the lexicon of all languages. This linkage must be readily available (and is therefore probably "innate"; Fisher et al., 1992; Gleitman, 1990: 29) to all children embarking on the process of language acquisition. The linkage functions always and everywhere to match semantic concepts of the type Concrete Object, Action, and Attribute with syntactic objects of the type Noun, Verb, and Adjective, respectively.³ Semantically anomalous members of any syntactic category (e.g., abstract nouns in English) are learned later in the acquisition process, by extension from nonanomalous cases. In general, word roots in the mental lexicon come labeled with a part-of-speech affiliation, much as they conventionally do in the dictionary.

3. PARTS OF SPEECH AND LINGUISTIC DIVERSITY

In a clear challenge to this position, a small but persistent lobby within the field of descriptive linguistics continues to argue that the distinction between Noun and Verb as lexical categories cannot be empirically defended across all languages (Foley, 2005; Sapir, 1917, 1921; Sasse, 1993; Swadesh, 1938). Evidence, usually from non-European languages, is offered to query the position that those classes of lexical forms that encode Concrete Object semantics also correspond universally to a syntactic category recognizable as a Noun, or that those classes that encode Action concepts always correspond to a universal syntactic category of Verb. The most classic examples show that in some languages the same lexical roots can have either nominal or verbal function, as these are defined by their privileges of morphosyntactic occurrence. Such issues of Noun–Verb ambiguity are certainly well known to and often remarked on by students of the modern Mayan languages, and by specialists in the study of the classic Mayan inscriptions (Bohnenmeyer, 1998; Bricker 1981a; Brown, 1998; Bruce, 1968; Hofling & Tesucún, 1997; Lois & Vapnarsky, 2003; Smailus, 1989).

Nowadays, however, to use even puzzling non-European data to pose an outright challenge to the universality of Noun and Verb constitutes very much the minority position in linguistics. Most linguists who have considered the problem since Whorf have concluded, with a discernible component of relief, that Noun and Verb can indeed be defended as crosslinguistically universal categories (Croft, 1993; Grimshaw, 1990; Hopper & Thompson, 1984; Langacker, 1990). The relief is traceable to the assumption that by defending Noun and Verb we can avoid what are taken to be the obvious—and obviously undesirable—Whorfian implications of any postulated Noun–Verb relativity (see Sasse, cited in Croft, 1993).⁴

An important component of the crosslinguistic defense of Noun and Verb has been the recognition (Hopper & Thompson, 1984) that we should not expect every occurrence in discourse even of a canonical Noun candidate form (e.g., English *man*, *horse*, or *house*) actually to behave syntactically as a Noun. Even English is full of possibilities for Nouns to adapt to Verbal function (as in *to man the ship*). In this respect, single examples from unfamiliar languages may be misleading, because they do not show all the possibilities of occurrence of a candidate form. To fully establish the existence of Noun, for example, as a semantic–syntactic linked category in the lexicon of any language, it is enough to show that in some reasonably routine way—but by no means necessarily always—the expected Concrete Object semantics is coupled with canonical Noun-like occurrence in syntax. To dispute the existence of such a category, on the other hand, a few examples of some noncanonical syntax–semantics match will not do. What is necessary is a demonstration that the canonical semantics–syntax co-occurrence *never* occurs in the language.

This rallying of linguists to defend the universal categories of Noun and Verb certainly appears reassuring from the bootstrappers' point of view. But in what follows I use linguistic data from Mopan Maya, an indigenous Central American language spoken by several thousand people in Guatemala and Belize, and currently being acquired as a first language by their children, to show that although it indeed remains possible to defend the existence of universal lexical categories of Noun and Verb for Mopan Maya, to do so leads us into unexpected philosophical terrain.⁵ In particular, in its current formulation, syntactic bootstrapping as applied to Mopan Maya forces us to consider very seriously Whorf's proposal that the intuitive philosophical division between Action and Object is not a property of nature, but a construal drawn from the structure of Indo-European languages.

4. BOOTSTRAPPING INTO MOPAN MAYA: A HYPOTHETICAL EXCURSION

Let us examine the syntactic form classes of Mopan from the point of view of a hypothetical Mopan child endeavoring to bootstrap his or her way into adult command of the language. We will assume the existence of universal syntactic

categories "Noun," "Verb," and an attenuated "Adjective," defined syntactically in the first instance by their possibilities of occurrence in the syntactic functions of Argument and Predicate (which to my knowledge have not been disputed in the linguistic literature), respectively. We will further assume a universal semantics-syntax linkage such that "names for concrete objects and for people are universally nouns" (Pinker, 1987: 406). Verbs will be semantically identifiable because they include "Names for Actions or Changes of State," and Adjectives because they show us "Names for Attributes."⁶

We will find that in certain critical respects, the everyday linkage of semantics to syntax in Mopan grammar is quite unlike that of English. Most importantly, a large group of Mopan phonological strings that function as the lexical translation equivalents of canonical English Action concept words (like *to run*, *to jump*, *to move*) consistently function in Mopan as syntactic Nouns and not as syntactic Verbs. As root forms, these strings have no Verbal privileges of occurrence. Therefore, any hypothesized strategy of pure semantic bootstrapping ("if it names an Action, it must be a Verb") simply will not lead the child to acquisition of adult Mopan. But if acquisition proceeds through syntactic bootstrapping ("if it's a Noun, it refers to a Concrete Object"), we can only conclude that these strings (RUN, JUMP, MOVE, and so on) are not among those that have Action concept semantics in the minds of adult Mopan speakers. It is possible to avoid such a Whorfian conclusion, while maintaining the hypothesis of universal semantics-syntax linkage in the lexicon, only by sacrificing the traditional categories Noun and Verb completely.

4.1. Finding Universal Semantic-Syntactic Form Classes in Mopan

4.1.1. Nouns

If we assume, with Maratsos (1990), Gentner (1982), and others, that Nouns are early recognized by children across languages by their relative absence of inflectional morphology and by their repeated occurrence in the presence of Concrete Objects, we will have done well by the Mopan child. In Mopan, a formally identifiable class of lexical items often referring to Concrete Objects (ready translation equivalents of English words like *horse*, *man*, *house*, etc.) exists, and indeed is relatively meager in morphological possibilities. Such forms, henceforth the Nouns of Mopan, can be inflected with an optional suffix for plurality, but with little else. So for Mopan *tz'imín* 'HORSE', we find *tz'imín-oo* 'HORSES'.⁷

An optional preposed determiner indicates definiteness (*a tz'imín* 'THE HORSE'). One of a series of person-indicating elements may also appear in the same position to indicate possession (*in tz'imín* 'MY HORSE', *u tz'imín* 'HIS/HER HORSE', etc.). Some Nouns (e.g., *otoch* 'HOUSE', *ni* 'NOSE', *na* 'MOTHER') do not normally occur without a possessor expressed in this way;

others are not so constrained (cf. Danziger, 1996a). Except in cases of nominal predication ('IT'S A HORSE!'), Mopan Nouns do not function as main predicates in clauses.⁸ They appear instead as syntactic Arguments to other forms, and refer to participants in the discourse (see examples 2, 4, 5, 7, and 9 below). Forms in this common class include *ja* 'WATER'; *k'ubeete* 'BUCKET'; *maax* 'MONKEY'; *miis* 'BROOM'; *winik* 'MAN', and many others (consult Ulrich & Ulrich, 1976, for more examples).

4.1.2. Verbs

Equally satisfactory to the bootstrapper is the fact that in Mopan it is not difficult to identify two semantic-syntactic classes that express "Action or Change of State" and that function exactly as we expect universal Verbs to do. Transitive and Intransitive Verbs are morphologically quite distinct in Mopan, but the members of both classes routinely play the role of main predicates in clauses, and take obligatory inflections both for person and for aspect/mood.

Transitive Verbs. Mopan Transitive Verbs take obligatory morphological inflections to cross-reference their two dependent arguments, and each occurrence of such a Verb is also obligatorily inflected for one of four distinct aspect/mood statuses. Forms in this large Mopan class include *ad* 'SAY SOMETHING'; *b'et* 'MAKE OR DO SOMETHING'; *il* 'SEE SOMETHING'; *jätz* 'STRIKE SOMETHING'; *jeb* 'OPEN'; *muk* 'BURY SOMETHING'; *pa* 'BREAK'; *si* 'GIVE SOMETHING AWAY'; *tz'a* 'PUT OR PLACE SOMETHING' (consult Ulrich & Ulrich, 1976, for more examples). For Transitive Verbs, Completive Aspect inflection gives the clearest expression to all of the obligatory morphological slots:

1. Mopan Transitive Verb, Completive Aspect⁹

Uy-il-aj-ech

3ACT-see-CMPL-2PTNT

'S/he saw you.'

2. Mopan Transitive Verb, Completive Aspect, with Lexical Noun Phrase Argument¹⁰

Uy-il-aj-Ø in 'tz'imín

3ACT-see-CMPL-3PTNT 1POSS horse

'S/he saw my horse.'

Intransitive Verbs. Like the Transitives, the Intransitive Verbs also occur as main predicates and are marked for aspect/mood status. They take inflectional marking for a single dependent argument. Forms in this class include *b'el* 'GO'; *ch'i*

'GROW'; *ch'ud* 'GET WET'; *em* 'DESCEND'; *jan* 'EAT'; *ka'al* 'BEGIN'; *ka'n* 'GET TIRED'; *k'ax* 'FALL'; *k'och* 'ARRIVE ELSEWHERE'; *tal* 'COME'; *uch* 'HAPPEN' (consult Ulrich & Ulrich, 1976; Danziger, 1996b: 409–410, for more examples). For Intransitive Verbs, Subjunctive Mood inflection gives the clearest expression to all of the obligatory morphological slots:¹¹

3. Intransitive Verb, Subjunctive Mood

...ka' tal-ak-ech
COMP come-SUBJ-2PTNT
'...that you should come.'

4. Intransitive Verb, Subjunctive Mood, with Lexical Noun Phrase Argument

... ka' tal-ak-Ø in tz'imin
COMP come-SUBJ-3PTNT 1POSS horse
'... that my horse should come.'

It will be of particular relevance for the later argument to note the existence of the regular Mopan Intransitive Verb *uch* 'HAPPEN':

5. Intransitive Verb *uch*, Subjunctive Mood with Lexical Noun Phrase Argument (This example is from Ulrich & Ulrich, 1982: 27, line 71)

wa ka' uch-uk-Ø a yuklaja...
Q COMP happen-SUBJ-3PTNT ART earthquake
'... if an earthquake should happen.'

4.1.3. Adjectives

Showing no inflection for aspect/mood status, but still appearing as main predicates in clauses and exhibiting marking with a person suffix for a single argument, is a class of forms encoding Names for Attributes and other State Concepts. Forms in this class include, for example, Mopan *b'ak* 'TO BE SKINNY'; *b'es* 'TO BE MUTE'; *b'ik* 'TO BE COARSE'; *b'ox* 'TO BE BLACK'; *ke'en* 'TO BE LOCATED'; *kook* 'TO BE DEAF'; *koom* 'TO BE TIGHT'; *ko'oj* 'TO BE EXPENSIVE'; *nooch* 'TO BE LARGE'; *saak* 'TO FEAR, BE AFRAID'; *wi'ij* 'TO BE HUNGRY'; *yan* 'TO EXIST' (consult Ulrich & Ulrich, 1976, and Danziger, 1996b: 407–409, for more examples). As in many languages, these forms pattern somewhat like Verbs and somewhat like English Adjectives. Unlike Mopan Nouns, however, they do not appear as referring arguments in clauses. Let us call these simply the Stative Predicates of Mopan.¹²

2. A PERSON, A PLACE, OR A THING?

6. Stative Predicate: Name for Attribute

Nooch-ech
be.large-2PTNT
'You are great.'

7. Stative Predicate with Lexical Noun Phrase Argument

Nooch-Ø in tz'imin
be.large-3PTNT 1POSS horse
'My horse is large.'

One frequently occurring predicate in this class is the regular Stative Predicate *tan* 'BE CONTINUOUS', a form that will recur in the discussion that follows.

8. Stative Predicate *tan*

K'ua tan-ech aleeb'e?
What be.continuous-2PTNT today
'What are you doing today?'

9. Stative Predicate *tan* with Lexical Noun Phrase Argument

Tan-Ø a ja'
be.continuous-3PTNT ART water
'It's raining.' (lit.: 'The water is continuous.')

4.2. Summary

We have seen that the syntactic category Noun, complete with Concrete Object semantics as required by the universal semantics–syntax linkage, can readily be defended in Mopan Maya. Equally, the syntactic category Verb, with the requisite semantics of "Action or Change of State," has not been difficult to discover in this language. We might also readily point out that those Verb forms with Action semantics tend to take Transitive marking, whereas those that encode Changes of State take Intransitive marking. Even the problematic category Adjective has found a match in Mopan that is consistent with the current crosslinguistic understanding that "Names for Attributes" often have highly predicative properties. The survey of Mopan form classes has been brief, but incorporates the necessary attempt at exhaustivity.¹³

The problem for the Mopan child who attempts to learn this language on the basis of a universal syntax–semantics linkage based on Noun and Verb arises when he or she grapples with those lexical items perhaps most commonly cited in acquisition

accounts as good examples of "Action Concept" encoding and as canonical Verbs. These are Mopan words such as *alka* 'RUN'; *awat* 'YELL'; *ok'ot* 'DANCE'; *siit* 'JUMP'; *t'an* 'SPEAK'; *che* 'LAUGH'; *peek* 'MOVE'; and many others (consult Ulrich & Ulrich, 1976; Danziger, 1996b: 410–411, for more examples). These forms can be characterized as those having something like Action semantics, but with reference to only a single participant.¹⁴ In Mopan, such forms never have the syntactic privileges of occurrence associated with Verbs in the adult language. Instead, they function morphosyntactically like the Mopan Nouns we have already described. For RUN, JUMP, FLY and many others, therefore, semantic bootstrapping gives the wrong outcome for adult Mopan (forms that name Actions should by hypothesis be syntactic Verbs, but in this language they are not). Syntactic bootstrapping meanwhile will yield correct adult Mopan forms, but logically fails to generate any hypothesis of Action semantics for these apparently most canonical Action Concept forms!

An account of the acquisition of these forms by Mopan children under a syntax–semantics linkage based on the categories Noun and Verb therefore cannot be achieved under semantic bootstrapping alone. An account based on syntactic bootstrapping, on the other hand, if based on a universal syntax–semantics link via the categories Noun and Verb, forces us to the Whorfian conclusion that the words RUN, JUMP, FLY, and so on do not have Action semantics in the minds of adult Mopan speakers.

5. MORPHOSYNTAX OF MOPAN MAYA 'RUN' AND ITS FELLOWS

In Mopan Maya, 'RUN' is expressed phonologically as *alka*, an unexceptional form that belongs to a coherent and readily identifiable form class. The morphosyntactic possibilities for the members of this class are such that they contrast reliably with the members of the classes identified earlier as Transitive Verbs, as Intransitive Verbs, and as Stative Predicates ("Adjectives"). In particular, in clear contrast to both Transitive and Intransitive Verbs, the single-argument Action concept forms (RUN, etc.) never inflect for aspect or for mood.¹⁵ And these forms never appear with the pronoun suffix that always cross-references the Argument of a Stative predicate. These descriptive statements do not represent preferences or statistical likelihoods. In adult Mopan it is a grammatical error of the first order to inflect RUN in the same way that HIT (Transitive Verb), GO (Intransitive Verb), and EXIST (Adjective/Stative) are inflected.¹⁶

All this could just mean that we have in hand yet another class of Verbs in Mopan. But, fatally for bootstrapping via Noun and Verb, the morphosyntactic patterning of forms in the Mopan RUN class is in fact not such as to allow them to contrast readily with the class identified as Nouns earlier (MAN, HORSE, and so on).¹⁷ In order to form a complete clause, Mopan RUN must, like any Noun, occur as a lexical Argument to another form, which is itself inflected for person and sometimes for aspect/mood. This other form functions as the main predicate of

the clause. Most common in that position are Intransitive Verbs (like *uch* 'HAPPEN') and Statives (like *tan* 'BE CONTINUOUS') whose own internal semantics convey some form of temporal contour.¹⁸ Like certain of the Nouns (e.g., HOUSE, NOSE, MOTHER), the non-transitive 'Action-Concept' forms (RUN, etc.) always occur with a pronoun prefix that indicates personal possession.¹⁹

10. Intransitive Verb *uch*, Subjunctive Mood, with Lexical Argument *alka* 'RUN'

Compare with examples 4 and 5 shown earlier.

... Ka' uch-uk-Ø in alka'
COMP happen-SUBJ-3PTNT 1POSS run
'... that I should run.' (lit.: '... that my running should happen.')

11. Stative Predicate *tan* with Lexical Argument *alka* 'RUN'

Compare with example 9 shown earlier.

Tan-Ø in alka'
be.continuous-3PTNT 1POSS run
'I run; I'm running.' (lit.: 'My running is continuous.')

To reiterate, these examples illustrate a regular and very frequent pattern of occurrence for a large class of lexical items in the language. In addition, in Mopan there is no alternative form of words or inflections that would yield a more robust Verbal analysis for underived *alka* 'RUN' and the many other forms like it.

5.1. Bootstrapping Mopan 'Run' from Nouns and Verbs

Because many canonical Action Concepts are not expressed by Verbs in this language, it seems clear that semantic bootstrapping alone cannot fully account for the acquisition of adult Mopan. Any Mopan child who embarks on a semantic bootstrapping strategy to acquire it will, by definition, have no difficulty in identifying Object, Action, Change of State, and Attribute semantics in the world. This child can readily sort through the available input to correctly assign phonological strings that refer to Concrete Objects to the syntactic Noun class, strings that refer to Changes of State to one of the Verb subclasses (Intransitive Verb), and strings that refer to Attributes to the Stative class. In addition, this child will be correct in assigning many phonological strings that indicate Action concepts to the Transitive Verb class. But we can predict that he or she will make many errors when assigning a syntactic affiliation to phonological strings that refer to the frequent situations in which Action is accomplished by only one participant. Our semantic bootstrapper persistently attempts to inflect these sorts of phonological strings as Verbs—perhaps using the existing Transitive or Intransitive aspect/mood suffixes to do so. This type of predicted error, diagnostic of the semantic bootstrapping approach, ought to be readily identifiable in any corpus of spontaneous Mopan child language.²⁰

The problem for acquisition arises of course when we ask how semantic bootstrappers could ever stop making errors of this type. At some stage the child must allow the syntactic facts of the language to override his or her innate endowment of expectations for the syntax- semantics link. This is not merely a matter of extending the contents or functions of a universal category already correctly learned via bootstrapping (as has been argued for semantic outliers like English *justice*, or non-canonical syntactic possibilities like English *to man*). No, semantic bootstrappers who find themselves learning Mopan must simply come (and, we suppose as usual, without negative evidence) actually to produce and understand lexical forms that flatly contradict the universal linkage which dictates that clear-cut Action semantics entails Verbal syntax. Some mechanism or strategy other than pure semantic bootstrapping must come into play to ensure that this happens.

This mechanism could be syntactic bootstrapping. The child who uses syntactic bootstrapping to learn the Mopan lexicon (either for all phonological strings or only for those that do not refer to Concrete Objects) will in fact fare better than the semantic bootstrapper in terms of actually acquiring the adult language. This child will correctly use the Verbal syntax of Transitive and Intransitive Verb occurrences to construct Action and Change of State meanings for the phonological strings involved. And he or she will not make the mistake of attempting to impose Verbal syntax on *alka* 'RUN' and forms like it, because morphosyntactic facts are the starting point, and not the end point, of the acquisition process under this strategy. On the contrary, by the rules of syntactic bootstrapping, the child can readily appreciate that these forms have Noun syntax, and will perhaps even attempt to apply them to Concrete Object referents on this basis. This child would therefore, we predict, make frequent acquisition errors that confuse reference to Action and to Object (e.g., *alka* 'RUN' used when HORSE is the intended referent).²¹ As acquisition progresses, we can assume that the child (like children everywhere) becomes able to understand that Concrete Object semantics does not constitute an ideal conceptual match for all of the phonological strings that populate the syntactic Noun class. The other members will eventually come to be understood as semantically anomalous Nouns, in a way perhaps analogous to the English child's eventual understanding that some Nouns represent abstract entities and not Concrete Objects.

Intriguingly from a Whorfian perspective, however, nowhere in this syntactic bootstrapping progression toward correct adult usage has there occurred a moment in which the Mopan child has considered the RUN forms for "Action Concept" semantics. It is the forms which are inflectable for aspect/mood, and which appear as clause predicates (like GIVE, MAKE, or COME, for example), that are being industriously scanned for this type of meaning. But not RUN. And not WALK, not KICK, not JUMP, not FLY. In none of these cases do the syntactic privileges of occurrence trigger any hypothesis of "Action Concept" semantics, by the rules of the syntactic bootstrapping game.

5.2. Theoretical Countermoves and Their Practical Failure

There is in short no apparent reason why a Mopan child following a syntactic bootstrapping strategy based on Noun and Verb should ever arrive at the notion that RUN, YELL, LAUGH, JUMP, MOVE, and others constitute Actions or Events in the sense that we seem intuitively to understand those terms. On the other hand, semantic bootstrapping cannot alone account for acquisition of adult Mopan.

It is possible, and perhaps even historically defensible, to hypothesize that all of the Mopan nontransitive Action-concept occurrences (RUN, etc.) actually represent deeper, more truly Verbal structures. There are various ways to declare this true for Mopan; the two most plausible involve invoking a surface-invisible process of nominalization, or analyzing the offending clauses as cases of serial predication.²² These analyses or others may perhaps save the theoretical situation for descriptive linguistics.²³ But none of them will help a child actually to acquire this language using bootstrapping based on Noun and Verb, because no theoretical account will change the facts of lexical occurrence that a child actually encounters and must eventually acquire.

Because, under these Deep Verb solutions, no surface criteria of form can distinguish Noun from Verb in a great many Mopan cases, "syntactic" form class assignment, for a given lexeme (e.g., MOTHER, RUN), must be permitted to depend entirely on semantics. At best, the distinction between Noun and Verb in actual Mopan utterances could under such analyses be brought down to a matter of lexical collocation. Forms that follow predicates with temporal semantics (TO HAPPEN, TO CONTINUE) can be declared Verbs. Forms that follow predicates with more existential semantics (TO EXIST, TO DIE) can be declared Nouns. But such an account cannot be translated into a satisfactory bootstrapping strategy, because it leaves nothing on the syntax side of the necessary syntax- semantics link.

To illustrate, let us propose, following the logic of the Deep Verb solution, that, faced with Action concepts in apparent Noun position, the Mopan child reverts to semantic bootstrapping. The form class that includes RUN will be analyzed as a Verb class. But how is the semantic bootstrapping child now to understand the semantics of forms in this same syntactic class that express HORSE, BUCKET, NOSE, MOTHER, and so on? Perhaps as "extended" or anomalous semantic Actions? If this is the solution, note that the Whorfian casualty this time is Concrete Object semantics itself.

The syntactic bootstrapper, meanwhile, also can make little practical use of the Deep Verb view. It is difficult to imagine how the child might identify a distinct syntactic class (Verbs for Action concepts but not for Concrete Objects) when such a class does not exist in adult production. How is the child to learn word meanings from syntax when the phonological strings *alka* 'RUN' and *tz'imín* 'HORSE' have such similar privileges of morphosyntactic occurrence?

At this point the defender of bootstrapping might be inclined to propose a dialectic course of acquisition in which the child simply switches back and forth from syntactic to semantic bootstrapping at need. As we have seen, it is possible that "switches" from syntactic to semantic bootstrapping and back could be visible in the type of acquisition errors made and not made by Mopan children. But "bootstrapping" is surely no longer really the right word for the procedure. If either end of the syntax-semantic link can be invoked as the starting point whenever necessary, then presumably neither end ever actually required assistance from the other: nothing substantial ever really needed to be acquired! In particular, in this case, knowing when to switch from a semantic to a syntactic starting point and back again would appear to require prior knowledge ("innate"?) of the peculiar syntax-semantic link that obtains in Mopan.

6. CONCLUSION

The question of child language acquisition has assumed the status of a crucial theoretical concern in linguistic theory since the Chomskyan revolution of the mid-20th century. A central plank of the argument in favor of a single universal grammar underlying all human languages has been the claim that universal mechanisms are needed in order to account for child language acquisition. The most fruitful approach to characterizing such universal mechanisms so far appears to invoke bootstrapping mechanisms that depend on a universal syntax-semantic link. But at the heart of the Mopan acquisition problem sketched here lies the fact that the universal syntax-semantic link that is necessary to all bootstrapping proposals does not hold in this language. What we find in Mopan is that the syntactic form class encoding many of the canonical "Action concepts" most frequently cited in the language acquisition literature is syntactically identical with the one whose members encode reference to clear and equally canonical Concrete Objects. Because this is so, semantic bootstrapping based on the proposed universal linkage is not a viable building block for the acquisition of adult Mopan. And syntactic bootstrapping yields the possibly disturbing prediction that forms like RUN, JUMP, and FLY do not have Action Concept semantics for Mopan speakers.

To avoid such predictions, language acquisition researchers will have to abandon Noun and Verb as categories of reflection, discussion, or investigation. So perhaps there is no universal linkage between syntax and semantics in the lexicon, and language acquisition via bootstrapping is not the answer. Or, more hopefully, perhaps there is a universal linkage, but our current understandings of syntax, semantics, or both have not so far been adequate to characterize it. To do so, we would have to search for a set of semantic contrasts that are crosslinguistically better attested to correlate with syntax than the contrast between Action and Object. This requires rethinking the linguistic categories and processes taken for granted in the more European-based linguistic theories that are the ones most commonly used by acquisition theorists. A clear starting-point from the Mopan perspective is that typology of linguistic form classes in which the semantics end of the

semantics-syntax linkage is anchored in Aktionsart or lexical aspect (DeLancey, 1985; Dowty, 1979; Foley & Van Valin, 1984; Levin & Rappaport, 1992; Van Valin, 1990; Vendler, 1967; see also Danziger, 1996b), a semantics concerned with degrees of duration, control, telicity, and relationality.²⁴

Whatever the solution adopted, it is at any rate clear from the Mopan data that such familiar semantic notions as Concrete Object, Action, and Attribute are in fact folk characterizations, and are not the semantic units in terms of which syntax is actually articulated across all languages. This last point naturally then leads us to consider to what extent our own linguistic intuitions are themselves language-influenced. The strong initial conviction that Action and Object were the obvious and only candidates for basic universal semantic classes perhaps indeed had something of the Whorfian about it too. As Whorf put it (1940/1956: 215):

It will be found that an "event" to *us* means "what our language classes as a verb" or something analogized therefrom. And it will be found that it is not possible to define 'event, thing, object, relationship,' and so on, from nature, but that to define them always involves a circuitous return to the grammatical categories of the definer's language.

To conclude, the hypothesis that Mopan children acquire their language by bootstrapping via universal categories of Noun and Verb has led us straight toward, and not away from, the radical consequences indicated by Whorf. But language acquisition via bootstrapping can perhaps be saved, and arguably without Whorfian consequences. Ironically, however, we can probably only do so if we are willing to abandon the traditional syntactico-semantic categories Noun and Verb as either universal in the structure of languages, or innate in the minds of language-learning children.

NOTES

¹In my text, words and expressions from actual languages, including English, are mentioned in the text using italics (e.g., *run*, *alka*). Concepts hypothesized to correspond to word meanings are presented in small caps, with glosses in quotation marks (e.g., 'RUN'). The higher-order mental categories into which these glosses are hypothesized to fit (e.g., Action, Object) are capitalized. In direct quotes from other authors, however, the orthographic conventions of the original are respected.

²Children in Brown's study pointed to different likely referents for novel words (e.g., *blick*) according to the syntactic category in which the word was presented to them (e.g., *some blick*, *a blick*, *blicking*). As the reference to Brown's classic study makes clear, the term *syntax* as used in the bootstrapping context must be broadly interpreted to include inflectional morphology as well as strict positioning of a given element in the phrase or sentence. This is quite correct from a crosslinguistic point of view, because the syntax-morphology boundary is far from uniform in the world's languages.

³Although it now appears quite clear that "Adjective" is a problematic category from the universal semantics-syntax linkage point of view (Dixon, 1982; Maratsos, 1990; etc.).

- ⁴Quite contrary to his own stated intentions (cf. Whorf, 1940/1956: 218), Whorf has certainly been read more often as a preacher of determinism and constraint than as one of liberation through self-knowledge.
- ⁵Mopan data and conclusions are based on my own field research with this language, conducted since 1986. All Mopan examples in this chapter are from my own corpus unless otherwise indicated. With the exception of some proper names, orthographic conventions for Mopan are as described in England and Elliott (1990). In this orthography, most of the consonants have roughly their Spanish values. Apostrophes represent glottal stops, or glottalization of the preceding consonant. The symbol ä denotes the mid-central vowel (schwa).
- ⁶See Danziger (1996) and Ulrich, Ulrich, and Peck (1986) for more on Mopan grammar.
- ⁷See Lucy (1992) for discussion of optional pluralization and other syntactic issues (including the relativity of the Mass/Count distinction) as they apply to Yucatek Maya. The issues are very similar in Mopan. They do not affect the current argument.
- ⁸Mopan has no copula verb. As we have seen, the fact that forms referring to Concrete Objects and functioning as syntactic Arguments in many contexts may also function as Predicates in no way of course detracts from their identification as Nouns for bootstrapping purposes.
- ⁹Abbreviations used in interlinear glossing: ACT, Transitive Subject; ART, Article; CMPL, Completive; COMP, Complementizer; POSS, Possessor; PTNT, Patient (Transitive Object/some Intransitive Subjects); Q, Interrogative/Conditional; SUBJ, Subjunctive; 1, First Person; 2, Second Person; 3, Third Person. For more on Mopan phonology and grammar see Ulrich et al. (1986) and Danziger (1996b).
- ¹⁰The third person nonplural form of the Mopan patient-marking suffix in this environment is morphological zero (see example 2).
- ¹¹In Mopan Intransitive Verbs, the single participant ("Subject") is often represented by the same pronoun suffix that also represents the Transitive Direct Object (cf. example 3). This does not affect the present argument. See Danziger (1996b) for full discussion.
- ¹²Many of these can undergo derivation to form Intransitive (e.g., GET BIG from BIG) or Transitive (MAKE SOMETHING BIG from BIG) Verbs.
- ¹³The form class of Positional Verbs, which appear to have a semantics ambiguous between voluntary "Action" and involuntary "Change of State," has not been discussed, nor need it be for the purposes of the present argument. Forms in this class inflect for aspect/mood and include *tin* 'SIT', *wa* 'STAND', *ch'uy* 'HANG', *sätz* 'STRETCH', *b'uy* 'COIL', and many others. See Danziger (1996b) for a more complete list and for further discussion.
- ¹⁴In other treatments, these might be called the Unergatives, Activity, or Manner predicates of Mopan (cf. Danziger, 1996b: 387; Perlmutter, 1978).
- ¹⁵This is one of the major differences between Mopan and the other languages of the Yucatecan subfamily (Danziger, 1996b).
- ¹⁶Derivational morphology can be added to *alka* 'RUN' and its fellows to yield Transitive Verbs (in the case of RUN, the semantic result is CHASE). We have

already seen that derived forms are not the relevant forms for confirming the universal syntax-semantics linkage (recall English *run*, *runner*).

- ¹⁷In fact, familiar nouns from European languages are routinely borrowed into the RUN class (Verbeeck, 1997). This, for example, is where we find Mopan *pieesta* 'PARTY', a clear relative of the Spanish Noun *fiesta*.
- ¹⁸Also very frequent in this position is the subjunctive of the Positional Verb *wa* 'STAND, STAY', yielding a habitual reading.
- ¹⁹The same prefix also normally indicates the Subject of a Transitive Verb and can sometimes indicate the single participant of an Intransitive Verb (Danziger, 1996b; Ulrich, Ulrich & Peck, 1986). A supposition of two homonymous pronoun series, one for Nouns and one for Verbs, is the best solution for preserving our traditional form-class dichotomy. If we adopt this solution, then syntactic evidence from elsewhere in the language (non-existence of aspect-mood inflection, appearance as clause Argument to inflected temporal predicate) dictates that the Activities (RUN, JUMP, FLY, etc.) must appear with the Nominal series of pronoun affixes. The homonymy solution is not of course completely satisfactory, especially in light of general typological and Mayan historical data (we know that the current state of affairs arose directly from a nominalization process; see Robertson, 1992). To abandon homonymy here, however, is certainly to confound the categories Noun and Verb in Mopan even further (cf. Bricker, 1981b)—to the point of proposing a syntactic continuum all the way from forms expressing semantic Accomplishments (here, the Transitive Verbs) to those expressing Concrete Object semantics.
- ²⁰Unfortunately no acquisition data for Mopan are available. Brown (1998) notes that children do not make inflectional errors when acquiring Noun-Verb ambiguous forms in the related language Tzeltal Maya.
- ²¹For Quinean reasons, such errors as these would be difficult to identify. Without empirical access to the referential intentions of children, they would be virtually invisible in any spontaneous language corpus. It is possible that experimental contexts could be designed to test for them.
- ²²Even less efficacious in accounting for language acquisition is the observation that Noun-Verb ambiguous forms in extant languages can usually be shown to have historically originated from and/or to be progressing toward less ambiguous configurations (cf. Croft, 1993). This is almost certainly true of Mopan too, but is of little help to the several thousand children who are today acquiring the language in its current form.
- ²³Although it is not good news for such analyses that in Mopan's sister languages, where it remains possible to inflect forms like RUN as Verbs, more, not less, morphology is necessary in order to do so (Bohnemeyer, 1998; Lehman, 1993; Lucy, 1994; Straight, 1976).
- ²⁴At present we have no idea what this sort of analysis would yield if employed to interpret acquisition across languages—for example, how it would play itself out in the literature of the crosslinguistic competition between so-called "Noun" and "Verb" in the young child's vocabulary (Bassano, 2000; Brown, 1998; Choi & Gopnik, 1995; Gentner, 1978, 1982; Nelson, Hampson, & Kessler Shaw, 1993; Tardif, 1995).

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CHAPTER 3

The Pitfalls of Getting from Here to There: Bootstrapping the Syntax and Semantics of Motion Event Coding in Yukatek Maya

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1. INTRODUCTION

According to Landau and Gleitman's (1985) syntactic bootstrapping hypothesis, children are guided in the acquisition of motion and state-change expressions by certain morphosyntactic clues which distinguish their meanings. In particular, source- and goal-denoting expressions such as *into* and *out of* identify (literal and metaphoric) motion event expressions. From the presence of these clues, children are able to predict that the expression encodes motion rather than state change. It is shown in this article that children acquiring Yukatek Maya cannot rely on such morphosyntactic clues to differentiate between motion and state-change meanings. Yukatek is a Native American language spoken by approximately 800,000 people living on the Yucatan peninsula in Mexico and Belize. In this language, the referential ground in a motion event, that is, the object or place with respect to which motion is described, is expressed by obliques which distinguish neither dynamicity ('move to/from' vs. 'be at') nor directionality (source vs. goal), and the verbs deployed in such constructions to assert change of location are morphologically members of a class of dedicated change-of-state verbs. So there is no morphosyntactic difference in Yukatek between the translations of 'enter the house' and 'die in the house'.

The semantic bootstrapping hypothesis of Pinker (1984, 1989), in contrast, predicts that children start from universal cognitive representations and learn to package these into language-particular semantic representations. These are then encoded according to universal linking rules. However, the semantics of motion event constructions in Yukatek does not seem to fall inside what Pinker assumes to be