3

The Impact of Grammatical Temporal Categories on Ultimate Attainment in L2 Learning

CHRISTIANE VON STUTTERHEIM AND MARY CARROLL
University of Heidelberg

FOREIGN LANGUAGE TEACHERS are familiar with the following experience of reading a paper written by a very advanced non-native speaker: Although it is impossible to point to a single lexical or grammatical error, information flow in the paper somehow does not meet expectations. In most of these cases, even describing what is unusual about the text is difficult—other than noting that native speakers do not write or speak like this. Is there something systematic in these manifestations of subtle inconsistencies that we might trace to the structure of the language itself? When speakers of different languages face a communicative task that requires production of a coherent text—as in the case of a narrative, a description, or a set of directives—are they guided in language-specific terms in the selection, organization, and expression of relevant information? If so, at what level in the process of language production do these inconsistencies occur—at the stage of conceptual planning, at the level at which concrete lexical or grammatical devices are selected, or at both? In Levelt's terms (1989, 1999), can we expect language specificity to play a role already within the *conceptualizer* or within the *formulator* only? Furthermore, can answers to these questions help us in understanding the specific problems that very advanced learners encounter in construing coherent texts?

Questions of this sort were the incentive behind a long-term research project at the University of Heidelberg, carried out in cooperation with several research groups at other European universities.[1] This project focuses on cross-linguistic differences in text production in standard as well as very advanced learner languages. Studies carried out within this frame have combined linguistic methods, including qualitative and interpretative corpus analysis, with psycholinguistic experiments that encompass chronometrical methods and eye-tracking studies. To date, these methods have not been systematically applied in second language acquisition research. The languages studied in this context have included Semitic (Modern Standard Arabic), Germanic (English, German, Dutch, Norwegian), and Romance languages (French, Italian, Spanish), as well as several learner languages both within and across these language groups (see Carroll and Lambert 2003; Carroll, von Stutterheim, and Nüse

2004). The gist of the findings is that information organization in language production follows distinct patterns that correlate with typological differences. More specifically, principles of information organization are perspective driven and are linked to patterns of grammaticization in the respective language.

In the context of these studies, we assume that to convey meaning through language, speakers have not only acquired a set of lexicogrammatical elements, they also have discovered the principles whereby representations of states of affairs typically are paired with certain lexicogrammatical structures that languages provide. The principles in question allow speakers to organize and shape the flow of information in context with respect to a given communicative goal. Language users learn to establish a conceptual framework that guides the kinds of decisions required in anchoring what is to be expressed in the domain of discourse. In particular, this framework means setting up the required viewpoints from which the material at issue will be presented for expression—for example, specification of a spatiotemporal frame, segmentation, topic focus assignment, or selection of a linearization principle. In this sense, the information at issue is transformed into units that can be expressed in a given context.

Against this background, the question of whether very advanced learners are able to discover these principles of construing what one might call "reportable content" in a foreign language—and, if so, how—is challenging. Do they identify the implications of specific grammatical means in the L2 for information organization—just as they do in L1 acquisition and use—or do they continue to rely on the principles of their respective L1?

In this essay we address these questions by looking at one specific domain—the conceptual domain of event construal—as the empirical basis for comparison and within that domain the grammatical feature of verbal aspect. We first present evidence for the interrelation between grammaticized means and specific principles of information organization by analyzing the language production of speakers from languages that differ in the way in which aspectual distinctions are coded. In the second part of this essay we investigate learner languages with respect to learning problems related to construction of meaning and selection of temporal perspective.

Background: Contrastive Text Analysis

The starting point of our research was an observation Carroll (1993) and Klein and von Stutterheim (1989) made in analyzing English and German texts of different genres: (re)narrations, descriptions, and directives. The analyses revealed significant differences in the way speakers of the two languages construed a coherent stretch of discourse. These differences relate to the domains selected for establishing coherence at the microstructural as well as the macrostructural level and can be linked to grammaticized means in the two languages.

Consider, for example, film retellings. The main tasks for the narrator lie in segmenting and selecting information stored in memory, anchoring information referentially, and connecting the events depicted in temporal terms. Each event will have to be represented by a dynamic predicate and its arguments. Starting with event structure, the situation referred to may be viewed, for example, as composed of three

phases: an onset phase, an intermediate phase or nucleus, and an endphase or point of closure. In addition to event structure (which may or may not take the form described), there is the concept of a timeline that is structured as an abstract sequence of intervals. In linking these elements, speakers not only have to decide on a specific anchoring point, which will allow them to link the "substance" to the timeline at the level of the single event; they also must decide how events linked in this way should be related to each other. All of these components form part of the "referential frame" that is structured with respect to a set perspective. This fixed perspective ensures that the type of information that is mapped into the different units making up a proposition can be linked in a coherent form. In other words, perspective-taking allows coherent integration and interrelation of principles that guide selection of units at the microstructural level and principles of information flow at the macrostructural level.

Given different options for construing the flow of information, the question is whether speakers of different languages prefer one set of options over another. We do not detail here the analyses of the film renarrations (for details, see Carroll and von Stutterheim 2003; von Stutterheim and Lambert 2005; and chapter 4 in this volume);[2] instead we provide a summary of the findings to serve as background for the studies we do present here. For English and German speakers, the analyses show significant cross-linguistic differences in film re-narrations with regard to the events selected for mention and, within identical events, with regard to different aspects of the situation (see von Stutterheim and Nüse 2003). The basis for these differences resides in the perspective taken: German speakers present events holistically—that is, events are represented as bounded, with an endpoint or a resultant state—whereas English speakers select a temporal perspective that incorporates ongoing events. In contrast to the German texts, in English many events are presented as unbounded, as evidenced in patterns of information selection. With respect to patterns of coherence, German speakers tend to segment complex dynamic situations into a set of events that are presented as occurring in sequence on the basis of the temporal relation y after x, which is established by explicitly linking the current time span or "topic time" to the preceding time of situation (for details see Klein 1994). Thus, the reference point provided by the preceding time of situation involves a bounded event.

In other words, this linking strategy requires a holistic view of events and entails expression of points of completion or the results of an event. A bounded event creates a "post time"—and with it the conditions for opening up a new interval on the timeline (temporal shift). Temporal shift therefore entails a sequence in strict terms (situation x is completed before y begins) and is coded by expressions such as *dann* (then), which relate to the post time of a preceding event (anaphoric relation). This perspective follows the event line from within—as a participant, as it were. In film retellings in English, on the other hand, speakers typically represent the narrative sequence by linking the current time span—the topic time—to the time of utterance, not to the preceding time of situation. The relevant relation is a relation of inclusion because the time of situation includes the topic time and overlaps with the time of utterance, given by a deictically anchored "now." A deictic point of view (external viewpoint) allows speakers to anchor events that are ongoing; in this temporal frame there is no need for one event to be represented as completed or bounded before

another one is introduced. The actual sequence often is implicit, and speakers also exploit other means—such as causal relations (x leads to y)—to show how events proceed (for details, see Carroll and von Stutterheim 2003; von Stutterheim, Carroll, and Klein 2003; von Stutterheim and Lambert 2005; and chapter 4 in this volume). Table 3.1 gives the number of bounded events as an indicator of the differences found in film re-narrations.

Why, however, should speakers of different languages rely on different principles of perspective-taking in solving the same communicative task? Although the differences between the two groups of subjects are related to the variable "native language," language as an abstract system may not be the only factor responsible for the differences at issue. After all, nothing in English *grammar* prohibits mentioning endpoints, nor is German lacking in means for referring to the notion of ongoingness (e.g., lexicalized means such as *dabei sein etwas zu tun*, "there-at be something to do," are available). Aside from the influence of grammaticized means, there may be a variety of possible nonlinguistic causes for the differences, ranging from individual stylistic differences or different learning traditions in constructing a text to deeply rooted cultural differences of various kinds.

To address the question of cultural differences, the study includes a group of speakers with a clearly different cultural tradition—namely, speakers of Arabic. Modern Standard Arabic (MSA) shares the critical grammatical feature of verbal aspect with English; in that regard, both languages contrast with German. If the construal of events in Arabic followed patterns other than those observed for English speakers, the result would support an explanation that relates contrasts to cultural tradition. If events were represented in similar terms in Arabic and English, however, the result would underscore structural linguistic factors. Given the results for the three languages, we can conclude that differences in construing event-time relations in narrative contexts are rooted in structural differences between the languages, with temporal morphology as the "trigger."

As it turns out, this posited co-relation was supported by another study that included speakers of Norwegian—a language that is similar to German with respect to verbal morphology. The results for Norwegian re-narrations were very similar to those for German speakers with respect to information selection, perspective-taking, and temporal linkage—underlining the hypothesis that grammaticized conceptual categories play a predominant role in how conceptual material is organized for verbalization. That factor previously had been attested cross-linguistically for spatial descriptions (Carroll 1997; Carroll et al. 2000). We further tested this hypothesis,

Table 3.1
Bounded versus Unbounded Events

	No. of propositions	Bounded (%)
L1 English	2,206	27.4
L1 German	2,189	51.4

Note: Numbers do not include utterances with inchoative aspect (e.g., *he starts*), modals (e.g., *he wants*), and states.

which runs counter to the widespread universalist position in cognitive linguistics and psycholinguistic research in language production, with a series of more controlled studies in which speakers of different languages were asked to verbalize a series of decontextualized individual events, presented as film clips.

Verbalization of Individual Events in L1

Reflecting the results of the text production studies, the languages we selected for further investigation had to exhibit structural contrasts that are relevant for the domain of event construal. Tense-aspect-systems seem to be crucial in this respect. Table 3.2 summarizes the temporal morphological means of the languages we studied for the present tense.

The Endpoint Study

The design of the empirical study was as follows. Subjects (twenty speakers per language) saw a series of individual situations (eighty items). These situations were presented in film clips that mainly depicted the initial or intermediate phases (or both) of a dynamic situation; the stage at which a possible endpoint was reached was not shown. Speakers were asked to tell what was happening and to verbalize the event as soon as they recognized what was going on. Their responses were audiotaped and transcribed.

The present tense is the preferred tense and is used across all languages studied. The following examples illustrate the individual situations described in the data.

	English	German
– endpoint	*a car is driving along a country road*	*ein Auto fährt auf einer Landstraße*
– effected object	*a man is painting*	*jemand malt*
+ endpoint	*a car is driving along a country road toward a house*	*ein Auto fährt auf einer Landstraße zu einem Haus*
+ effected object	*a man is painting a picture*	*ein Mann malt irgendwas*

Table 3.3 lists the frequency with which endpoints are mentioned across the four languages. Of the eighty situations shown, eighteen could be conceptualized as bounded; they form the basis of the analysis.

Table 3.2
Language Overview

Morphological Tense and Aspect Features (x)		**Modern Standard Arabic (MSA)**	English	Norwegian	German
Tense		[periphrastic]	x	x	x
Aspect	Imperfective	x	x	[serial verbs]	[lexical]
	Perfective	x	—	—	—

Table 3.3
Percentage of Cases in which Endpoints Are Mentioned (averaged over 20 subjects per group, 18 items)

L1 German	L1 Norwegian	L1 English	L1 Arabic (MSA)
76.4	69.8	25.2	23.8

Note: Both types of event closures are plotted together: literal endpoints in terms of goal information in a motion event, and results of actions that imply a change in state (either for the subject or the object) and thereby closure of the causative action.

Our focus on dynamic scenes that mainly depict initial and intermediate phases of an event was intentional in that it allowed us to investigate two issues. First, speakers of languages in which phasal decomposition is grammaticized, such as Arabic and English, in theory could refer to any one phase; the question was whether they actually would do so. Second, for German speakers the absence of scenes that depicted an endpoint pushed the preferences observed in the re-narrations to the limits; in their case, the question was whether the focus on endpoints would lead them to scan the visual input for likely (or even less likely) endpoints in dynamic scenes in which no endpoint is actually shown.

We can interpret the results as a confirmation of the initial hypothesis. In the languages in which phasal decomposition is grammaticized—in this case, Arabic and English—speakers related to the phases of the events that were depicted in the scene. As we have noted, the majority of the scenes we selected depict either the beginning or an intermediate phase of an event, and verbalizations related to these phases were less likely to include an endpoint. In both languages, speakers used the aspectually marked form—that is, the progressive (English) and imperfective (MSA). By contrast, the nonaspect languages, Norwegian and German, cluster together, in that speakers construe events under a holistic perspective. Endpoints are expressed, even if they have to be inferred or invented.

Speech Onset Times: Time Course of Production

Because analyses of linguistic *products* do not allow for conclusions with respect to language-related differences in *processing*, other methods are required to gain insights into the planning phase—that is, the conceptualization phase in speech production. To measure speech onset times, we adopted a psycholinguistic tool that allows for tracking of differences that reflect the cognitive load involved in a verbal task.

Our hypothesis is as follows. Speech production data show that what constitutes *a reportable event* differs in accordance with the linguistic system. If language-specific principles are already at work at the level of conceptualization, one could expect a time effect, depending on the different requirements for information selection. For German and Norwegian speakers, having to include an endpoint to form a reportable event would mean that they could either start speaking before they have all relevant information about the final phase of the event depicted or they could wait until the endpoint of an action or an activity could be identified and then start with speech production. For the English and Arabic speakers, the temporal properties of the

scenes presented would have different implications for the planning process because they encode the initial or intermediate phase, as depicted in the film clip. This pattern can be attributed to the fact that any phase of an event is a reportable unit in languages in which phasal decomposition is grammaticized. In other words, speakers of English or Arabic do not need to construe a final phase or endpoint to have a reportable unit. Therefore, if language-specific constraints already drive processes at the level of conceptual planning, we can expect a delay in speech onset times for German and Norwegian speakers, relative to Arabic and English speakers, in cases in which the endpoint of an action is not immediately evident in the visual input. We analyzed the same data that formed the basis for the endpoint study we describe above for speech onset times with German and English speakers. Our results indicate speech onset times of 4.6 seconds for L1 German and 3.5 seconds for L1 English.

An item-based analysis of the types of events represented in relation to the pattern of speech onset times (SOT) revealed that German speakers waited for an endpoint in situations in which the endpoint cannot be easily inferred or cannot be inferred at all. We observed significant cross-linguistic differences in relation to these items (*cf.* comparison to learner languages below).

The results confirm the findings in the analyses of the verbal productions: To conceptualize what can function as a reportable event, German speakers show a clear preference for a holistic perspective, which implies having to wait before speaking until the scene as a whole has unfolded. By contrast, because any phase of a motion event constitutes a reportable unit (taking the scenes presented) for speakers of English, these speakers can relate to the initial or intermediate phase of a situation, such as *a boat is sinking* or *a boy is running,* without having to wait for a possible outcome.

Eye Tracker Study

In the search for a window into planning processes in the phase of preverbal conceptualization—that is, in organizing information for expression—these results prompted another psycholinguistic experiment, using the method of eye tracking with the same stimuli. Although the study is still in progress, the results show significant processing differences for speakers of languages that code aspect grammatically relative to speakers of languages with lexical means.

The hypothesis underlying the eye tracking study is as follows. In dynamic scenes that show goal-oriented motion events—a person or thing on its way from one place to another—German speakers can be expected to scan the scene for the endpoints of such events. Furthermore, they may search the scene for possible candidates when an endpoint is not immediately evident. Because speakers of English typically code the initial or intermediate phase of the respective event, they can be expected not to fixate regions at which possible endpoints could be identified to the same extent as German speakers do. Again, we selected eighteen scenes from a set of eighty items as test items. These eighteen scenes depicted goal-oriented motion events in which the goal was not reached but could be inferred or construed. An example is a car driving down a country lane that goes past a farmhouse; the farmhouse

is in the background of the scene depicted, so speakers can wait while they consider the farmhouse as a possible endpoint.

To determine whether subjects look at endpoints before they start speaking and, thus, before they finish planning the first part of the utterance or whether they attend to endpoints only while they already are articulating the first part of the clause and then possibly producing the corresponding locative prepositional phrase, we distinguish between fixations *before* and fixations *after* speech onset (SO). Subjects started speaking before the film clips ended, so fixations after speech onset were always possible. Table 3.4 gives the results for the two language groups.[3]

With regard to fixation before SO, we found that German speakers focus on the endpoint of an action before they start to speak, whereas English speakers start to speak before they look at this particular region. This finding indicates that in conceptualizing content to form a verbal representation of the scene depicted, German speakers attend to other—in this case, more—components of the visual input relative to English speakers.

Why is there such a pronounced difference between fixations before and after SO for the English group? English speakers apparently start to speak before they focus on the endpoint. This finding can be linked to the fact that events that are treated as ongoing have been decomposed into phases (inchoative, intermediate, and terminative phase). Thus, any phase of an event, as depicted in the stimuli at issue here, is a reportable unit in itself. Significantly, these speakers can conjoin one phase with another so that the encoding of the final phase with an additional verbalization of an endpoint can occur thereafter: *A car is going along the road . . .* ***to the station*** clearly is possible in English.[4] As with SO, the underlying phasal structure can explain why English speakers—in contrast to speakers of German—do not have to scan the scene for an endpoint to arrive at a conceptual unit that corresponds to a reportable event. The eye tracking results show, however, that in the course of the scanning process these speakers visually control for possible endpoints. Speakers can add the terminative phase and easily integrate it into the sentence that is already underway: *a car is going down a lane . . . to a farmhouse.* Although the findings are tentative, the results point to a language-specific effect at the level of conceptualization.

Information Organization in Advanced Learner Languages

These findings open new aspects and foreground longstanding questions for L2 acquisition research. Can we find support for our claim that linguistic knowledge not only covers lexicon, syntax, morphology, and phonology but also encompasses a

Table 3.4
Number of Fixations of Endpoints before and after Speech Onset (SO)

	L1 German	L1 English
Fixations before SO	6.9	2.9
Fixations after SO	9.5	8.5

specific set of principles of information organization? Are these principles particularly difficult to detect and acquire, resulting in problems that are related not so much to form as to factors governing their use? Might some problems of ultimate attainment—such as the subtle inconsistencies mentioned in the introduction to this essay—find an explanation in this context? To address these questions, we extended the foregoing empirical studies to very advanced learners. We used the same type of stimuli and elicitation method to carry out production experiments with learners of German and English, with the other language as the respective L1. The results for film re-narrations are reported in detail elsewhere (see Carroll and von Stutterheim 2003; von Stutterheim and Lambert 2005; and chapter 4 in this volume). In the following analyses, we again focus on patterns of event construal with respect to the category of boundedness.

Verbalization of Individual Events

In the first study, twenty advanced English learners of German and twenty advanced German learners of English were shown the eighty short scenes on a monitor and asked to tell "what is happening."[5] As in the L1 study, the analyses of endpoints were based on eighteen relevant items where an endpoint could be mentioned. Table 3.5 lists the percentage of endpoints mentioned for twenty speakers for these items; L1 results are repeated for comparison.

Broadly speaking, both learner groups are moving toward the target language norm. As the results indicate, however, this trend holds to a lesser degree for English learners of German than for their German counterparts. In other words, for the domain of events, learners of English seem to acquire the underlying linguistic knowledge associated with a form such as the progressive more easily, compared to the holistic perspective required of learners of German. Further data analysis, however, reveals a noteworthy additional difference. Data analysis of the German learners of English shows that references to an endpoint are omitted in scenes where the endpoint can be inferred—that is, where it is implicitly given. By contrast, where endpoints cannot be inferred, German learners of English tend to mention them. This finding brings us back to the principal difference between English and German: Speakers of German will wait to uncover the endpoint in cases where it is not evident, thereby allowing conceptualization of the situation in holistic terms; speakers of English do so to a significantly lesser degree because any phase is reportable.

To specify the differences even more closely, we carried out a more fine-grained analysis. In light of the preceding results, we divided the items into two groups: those in which the endpoint of the events depicted was inferable—in the sense of being highly predictable—and those where this was not the case. Two examples illustrate the distinction:

(a) Inferable endpoint: a boy jumping off a cupboard **onto the floor**.
(b) Endpoint not easily inferred: a car driving along a country road that goes past **a house**.

Table 3.6 provides an overview of the results for scenes of category (a).

Table 3.5
Endpoints Mentioned (average values, in percent, for 20 speakers per group), L1 and L2

L1 English	L1German–L2English	L1 German	L1English–L2German
25.2	36.7	76.4	31.6

Table 3.6
Endpoints Inferable: Percentage of Cases in which Endpoints Are Mentioned (averaged over 20 subjects per group), L1 and L2

L1 German	L1English–L2German	L1 English	L1German–L2English
50.0	29.4	25.0	13.0

L1 German users show a clear tendency to mention endpoints in these cases, but German learners of English omit their mention almost completely. In keeping with the general pattern for English learners of German, the frequency with which the endpoint is mentioned does not differ markedly from that for English L1 speakers.

Comparison with items of the category (b), where endpoints are not easily inferred, revealed a clear cross-linguistic difference. German learners of English clearly relate to an endpoint in cases of this kind, as shown in table 3.7, whereas English learners of German do not mention endpoints in this case and thus do not proceed on the basis of target language principles of information organization.

Distribution of the endpoints specified shows that L1 principles remain dominant for advanced L2 learners when they are conceptualizing what is considered to be a reportable event. German learners of English omit reference to an endpoint in situations in which it can be easily inferred, and reference to this type of situation accounts for most of the cases in which endpoints were not mentioned; they do refer to endpoints, however, where these endpoints are not implied by the predicate used. The English learners of German have not uncovered the holistic pattern of construal in German by which events are viewed as bounded. For both learner groups, the L2 productions are in accordance with principles of event construal in their respective L1.

Speech Onset Times: Time Course of L2 Production

Findings with respect to SOT in the learner data also support the general tendency observed in the production data. Measuring SOT with the same stimuli selected for the L1 speakers, we again note a significant difference between the two learner groups. As table 3.8 shows, German speakers move toward the target language, whereas English speakers show the same patterns in both the L1 and the L2. These

Table 3.7
Endpoints *Not* Readily Inferable: Percentage of Cases in which Endpoints Are Mentioned (averaged over 20 subjects per group)

L1 English	L1German–L2English	L1 German	L1English–L2German
25.0	70.6	68.0	20.0

Table 3.8
Speech Onset Times (seconds)

L1 German	L1German–L2English	L1 English	L1English–L2 German
4.3	3.0	3.6	3.8

findings support the general tendency observed to date, in that German speakers move toward the target language to a greater extent.

The results of this analysis of preferences in event construal in learner languages support the conclusion that even very advanced learners retain the principles of event construal of their L1 in certain functional contexts. The data show that speakers draw on preferences for construing meaning for speaking developed in the course of L1 acquisition to solve verbal tasks in the L2. Language-specific preferences in information organization can be traced to meanings that are grammaticized in the respective languages. A close interrelation between patterns of grammaticization and principles of information organization at the text level also has been attested in a cross-linguistic study with respect to other syntactic domains (role of syntactic subject) and other communicative tasks (spatial descriptions). Here too, grammatical features such as the syntactic subject, word order (verb-second constraint in main clauses in German, for example), and the morphosyntactic structure of spatial expressions could be shown to lead to language-specific patterns in information organization (see Carroll et al. 2000; see also chapter 4, this volume).

One particularly interesting result in the data lies in the differences between German and English L2 speakers in the domain selected for analysis. The data suggest that English learners of German are further away from the target language pattern, compared to German learners of English. In other words, even assuming that the formal features have been acquired, moving to the English pattern of use still seems easier than the other way around. This finding may be attributable to the fact that English has a salient grammatical form that encodes the specific perspective of ongoingness—the progressive. By acquiring this form, the learner of English is led to find the function served by this form. For the learner of German, by contrast, there is no device for the expression of "holisticness." In analyzing the input, learners have to identify this concept and its function on the basis of inference processes that will span different informational components in a sentence, such as complements or adjuncts. The differences in acquisition of target language principles may lie in the complexity of that process.

Conclusion

Analysis of how the languages we investigated cluster with respect to the features we investigated provides clear evidence for the assumption that grammaticized meanings play a crucial role in determining how speakers proceed in solving the manifold tasks in language production. Speakers of Arabic and English share the same grammaticized feature (progressive aspect, imperfectivity), which is crucial in event

construal, and they follow similar principles in the tasks we studied in construing content for speaking. Speakers of English, MSA, German, and Norwegian organize information under different perspectives and these perspectives also correlate with grammaticized features of the languages in question. The differences we observed are significant for the language pairs English–German and MSA–German. Contrasts are manifested both in selection of aspects of a situation for explicit representation (components of factual knowledge left for inferencing, components left unspecified) and the way information selected for mention is structured. Our observations confirm the hypothesis that given different grammatical systems, speakers develop specific overarching principles in the construction of referential frames and hence the types of event-time relations they incorporate. These underlying principles allow for integration of structural requirements across different conceptual domains and ensure a high degree of coherence across the means selected.

One could argue that in the course of acquiring one's first language, acquisition of grammatical structures and lexical forms results in principles that determine how information organization proceeds in context. After a long process of elaboration of the basic system, lasting until the age of fourteen or fifteen, native speakers finally achieve full competence in organizing information not only at the sentence level but also with respect to macrostructural organization (Halm 2007). We can assume that this development results in a specific level of linguistic knowledge that consists of general principles or strategies that determine what counts as a reportable informational unit in a given context. Reliance on these principles of information organization provides speakers with a set of criteria that enables them to carry out the complex set of tasks in text production in a coherent fashion. We can regard these results as a specification of what Slobin (1991, 1996) has called "thinking for speaking."

Returning to the main question we outline at the beginning of this essay—namely, the nature of the final steps in acquisition—the data provide evidence that in adult L2 acquisition these principles are no longer "automatically" constructed on the basis of the relevant formal categories. Instead, L2 speakers, even at a very advanced stage, also draw on L1 principles in construing reportable content. Indeed, identification and activation in the production process of target language principles seem to be extremely difficult and pose a persistent problem in the L2 even at advanced stages. Reasons for that difficulty may lie in the fact that these principles are essential in the interpretation and conceptualization of reality. They are extremely powerful in that they are abstract enough to enable the speaker to treat all kinds of situations within a consistent conceptual framework. Inasmuch as the evidence required to construct this conceptual network comes from many domains, it presents a degree of complexity that L2 learners will find difficult to process. Taking all these aspects into account, we conclude that the central factor impeding the acquisitional process at advanced stages ultimately is grammatical in nature, in that learners have to uncover the role accorded to grammaticized meanings and what their presence, or absence, entails in information organization.

NOTES

We would like to thank the Deutsche Forschungsgemeinschaft for financing the project described in this chapter.

1. In addition to the authors, the Heidelberg group includes Barbara Schmiedtova, Abbassia Bouhaous, and Natasha Sahonenko; cross-linguistic research has been carried out in cooperation with Monique Lambert (University of Paris VIII), Marianna Starren (Katholieke Universiteit Nijmegen), and Bergljot Behrens (University of Oslo). The eye tracking study was carried out by a former project member, Ralf Nüse.
2. The film is a silent animation (11 minutes long) with the title *Quest* that tells the story of a clay figure who has to face several obstacles in five different worlds.
3. Eye tracking studies with Arabic speakers and advanced L2 learners currently are being carried out; results are not yet available.
4. This is not the case in Dutch, where the progressive can be described as on its way to grammaticalization. In Dutch the progressive is incompatible with endpoints **de trein is **naar de station** an het rijen*. Eye tracking results for Dutch underline this difference in that Dutch speakers do not look at endpoints after speech onset.
5. Determination of whether learners can be classified as advanced is based on formal proficiency and lexical repertoire for the German learners of English; the latter measure was assessed in relation to the lexical means used by native speakers of English (thirty-five speakers in all) in the same task. English learners of German are classified on the basis of formal accuracy in their L2 productions with respect to nominal and verbal morphology.

REFERENCES

Carroll, Mary. 1993. Deictic and intrinsic orientation in spatial descriptions: A comparison between English and German. In *Cognition and culture: A cross-cultural approach to cognitive psychology,* ed. Jeanette Altarriba. Amsterdam: North-Holland, 23–44.

———. 1997. Conceptualization of spatial relations. In *Language and conceptualization,* ed. Jan Nuyts and Eric Pederson. Cambridge: Cambridge University Press, 137–61.

Carroll, Mary, Christiane von Stutterheim, and Ralf Nüse. 2004. The language and thought debate: A psycholinguistic approach. In *Approaches to language production,* ed. Christopher Habel and Thomas Pechmann. Berlin: de Gruyter, 183–218.

Carroll, Mary, and Monique Lambert. 2003. Information structure in narratives and the role of grammaticised knowledge: A study of adult French and German learners of English. In *Information structure and the dynamics of language acquisition,* ed. Christine Dimroth and Marianne Starren. Amsterdam/Philadelphia: John Benjamins, 267–87.

Carroll, Mary, and Christiane von Stutterheim. 2003. Typology and information organisation: Perspective taking and language-specific effects in the construction of events. In *Typology and second language acquisition,* ed. Anna G. Ramat. Berlin: de Gruyter, 365–402.

Carroll, Mary, Jorge Murcia-Serra, Marzena Watorek, and Alessandra Bendiscioli. 2000. The relevance of information organization to second language acquisition studies: The descriptive discourse of advanced adult learners of German." *Studies in Second Language Acquisition* 22:441–66 (special issue, ed. Clive Perdue).

Halm, Ute. 2007. Zum Ausdruck temporaler Kategorien im Diskurs: Die Entwicklung narrativer Kompetenz in Filmnacherzählungen von Kindern zwischen 7 und 14 Jahren. Ph.D. diss., University of Heidelberg.

Klein, Wolfgang. 1994. *Time in language*. London: Routledge.

Klein, Wolfgang, and Christiane von Stutterheim. 1989. Referential movement in descriptive and narrative discourse. In *Language processing in social context,* ed. Rainer Dietrich and Carl Friedrich Graumann. Amsterdam/Philadelphia: John Benjamins, 39–76.

Levelt, Willem J. M. 1989. *Speaking: From intention to articulation.* Cambridge, Mass.: MIT Press.

———. 1999. Producing spoken language: A blueprint of the speaker. In *The neurocognition of language,* ed. Colin M. Brown and Peter Hagoort. Oxford: Oxford University Press, 83–122.

Slobin, Dan I. 1991. Learning to think for speaking: Native language, cognition and rhetorical style. *Pragmatics* 1:7–26.

———. 1996. From "thought and language" to "thinking for speaking." In *Rethinking linguistic relativity,* ed. John J. Gumperz and Stephen C. Levinson. Cambridge: Cambridge University Press, 70–96.

Stutterheim, Christiane von, and Monique Lambert. 2005. Crosslinguistic analysis of temporal perspectives in text production. In *The structure of learner varieties,* ed. Henriette Hendriks. Berlin: de Gruyter, 203–30.

Stutterheim, Christiane von, and Ralf Nüse. 2003. Processes of conceptualization in language production: Language-specific perspectives and event construal. *Linguistics* 41:851–81 (special issue: Perspectives in Language Production).

Stutterheim, Christiane von, Mary Carroll, and Wolfgang Klein. 2003. Two ways of construing complex temporal structures. In *Deictic conceptualization of space, time and person,* ed. Friedrich Lenz. Berlin: de Gruyter, 97–133.