The *language and thought* debate: a psycholinguistic approach

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1. Introduction

The current discussion on the relation between language and thought has been with us for many centuries and can be traced back to Greek philosophy. In the language philosophy of Plato the unquestioned assumption was that language can assume an ideal form in relation to thought, a view which lasted into the Middle Ages and was revived again in the age of Enlightenment. Although the relation between language and thought has never been seriously questioned, the crucial question rests on the nature of this relation and whether language influences the way in which we partition and classify the experienced world (Gumperz and Levinson 1996; Gentner and Goldin-Meadow 2003). One of the first to formulate a clear position under a comparative perspective was W. v. Humboldt. Although Humboldt believes that people can acquire different views on the world by learning a new language, he retains a normative viewpoint in regarding a particular type of language (inflectional) as optimally suited for formulating thought. Radical interpretations of this form of linguistic relativity consolidated the notion of linguistic determinism (cf. Lee 1996), a position which implies that speakers who have learned a given language not only develop language-specific conceptual structures but are also bound by them, a view which rightly or wrongly has been termed the Sapir-Whorf hypothesis.

This debate received new impetus in the areas of cognitive science, cultural anthropology, cognitive linguistics, and developmental psychology with the introduction of new and more rigorous tools of investigation. Theories of human cognition in cognitive science are based on the

assumption of a universal cognitive base for human reasoning and conceptualisation. Given the fact that there had been a lack of stringent crosscultural investigations which are necessary in testing relevant claims, empirical researchers in the domain of cultural anthropology set out to investigate this question.

The results present convincing evidence that language-specific encoding patterns are both facilitators of a specific cognitive style and a bottle-neck, thereby constraining mental representations in line with the output modality (Levinson in press; Lucy 1996). They refute studies in cognitive science that treat language as a medium which leaves the speaker with an unrestricted number of encoding options. The general view in this latter case is that "linguistic systems are merely the formal and expressive medium that speakers devise to describe their mental representations and manipulations of their reference world." (Li and Gleitman 2002: 23).

In the domain of linguistics and language development the role of language in conceptualisation was taken up in cognitive linguistics and developmental psychology where attention was drawn in particular to the role of grammatical form in relation to cognition. In describing the relation of grammar to cognition Talmy (1988) proposed that grammar expresses a restricted set of general notions that make up the basic schematic framework for conceptual organisation within the cognitive domain of language. The "set of grammatically specified notions collectively constitutes the fundamental conceptual structuring system of language" (Talmy 1988: 166). This view led to work which investigates both the unity across different languages, as well as their diversity, and what this entails (Talmy 2000). Applied in the context of developmental psychology it was assumed that the child learns a particular 'framework for schematising experience' in acquiring the grammar of a particular language which holds when *thinking for speaking*, i.e. when speakers are required to code information in a specific linguistic system, but this need not be the case when reasoning takes place outside linguistic tasks (cf. Slobin 1987, 1991, 1996; Berman and Slobin 1994).

Within this context further research is required which deals with the level in cognitive processing at which possible cross-linguistic divergences take place. New tools of investigation which provide more fine-grained insights into cognitive processes have prepared the ground for further work at this level. In the following we will summarise a series of crosslinguistic studies which investigate the role of grammatical form in language production at a specific level of cognitive processing – that of preparing

content for verbalisation. Attention is placed on the role of grammatical categories in focusing specific components of a given situation and in structuring meaning. Languages exhibit considerable diversity in their mapping patterns in that meanings which are coded in some languages in lexical form are coded grammatically in others. We assume that grammaticised meanings play a central role in determining the decisions which speakers make when preparing content for expression. Grammatical form is not viewed in the present context as a separate system which is independent of meaning, but as one which incorporates a system of meanings which is treated in a given language as prominent in the conceptualisation of states of affairs. As stated in Hockett (1954), crosslinguistic diversity consists less in what is possible to specify than in the relative ease with which meanings can be specified. The expression of a temporal concept such as *ongoingness* (*they are speaking*) is a case in point. Speakers of languages in which a concept of this kind is grammaticised on the verb (Arabic, English, Spanish, for example) are more likely to express corresponding aspects of a dynamic situation, when relevant in context, compared to speakers who have to resort to lexical means in order to convey the same kind of information, such as in French or German, as will be shown below.

In order to pinpoint the set of factors which determine the means selected in language use, we need criteria which help assess the relevance of linguistic over other possible factors, such as cultural or contextual determinants. One way of isolating such factors is to collect data from languages which share the same cultural background but have different linguistic systems (cf. Pederson 1995). Another is to take different languages and cultural groups (Arabic and English speakers, for example) keeping constant a certain set of relevant linguistic features, such as grammatical *aspect*, *null-subject features/free word order* (Italian, Spanish), *verb second constraint* (German, Dutch), *fixed word order* (English, French). If grammaticised meanings drive the coding options selected in language use, languages which share a similar grammatical profile should exhibit similar patterns of conceptualisation when preparing content for expression. This is the procedure adopted in the present cross-linguistic comparisons.

2. Preparing information for speaking: the conceptualiser

The preparation of content for speaking, i.e. the transformation of units of information into a format which is expressible in a given language involves processes of different kinds.[1] Models of language production play a relevant role in this context in that they provide a framework in which research on processes in information organisation can be located. Levelt's *blueprint of the speaker* (Levelt 1999) distinguishes three basic components which are involved in any kind of verbal activity: conceptualisation (the component in which content is prepared for expression), formulation (the component in which content is mapped into linguistic form by accessing lexical, syntactic, and phonological knowledge) and articulation (where relevant structures are mapped into motoric processes). In the conceptualiser conceptual units and structures are selected from memory and structured according to specific frames of reference, function argument relations, and factors determining linearisation. These tasks have to be solved before specific linguistic devices at the level of lexical and syntactic knowledge are activated (Levelt 1996, 1999). In theory one could assume that these processes, which are divided into two types – *macrostructural* and *microstructural*, are not only pre-linguistic but language independent, and this is the position which is either explicitly or implicitly adopted in most of the research in this domain (cf. Levelt 1999; Bierwisch and Schreuder 1992; Habel and Tappe 1999). The universal nature of processes at a macrostructural level (i.e. considering what to say) is a mainly unquestioned assumption and the focus of interest in empirical studies generally relates to later steps in the production process.

There are thus very few studies which actually address the question of language specificity at the level of both macrostructural and microstructural planning in the conceptualiser and this is the task which we set out to investigate in a series of studies: to what extent are processes in the conceptualiser language specific, and what role do grammaticised meanings play in guiding the decisions which speakers make when selecting and preparing content for expression?

Before coming to the individual studies let us be more specific about the nature of the tasks and planning processes assigned to the conceptualiser on the path from knowledge activation to an expressible format

Segmentation
Units have to be formed and extracted from a knowledge base which is neither structured with respect to sequence nor organised hierarchically with respect to a given subject material. When considering what to say, complex static situations, for instance, have to be broken down into a number of states or property predications, or complex dynamic situations have to be divided into events or processes.

Selection
Speakers has to select the units they want to verbalise as well as the components by which they can be represented. By components we mean the conceptual building blocks, such as entities, spaces, times, properties, actions, from which propositional units can be formed.

Structuring
The components selected have to be structured under several aspects which cover options with respect to possible frames of reference (e.g. spatial and temporal anchoring), predicate types and argument roles (agent, undergoer, *sell, buy* alternative, for example), specification of informational status (topic focus assignment). All of these steps in the planning process are perspective driven (cf. von Stutterheim and Klein 2002).

Linearisation
The units selected for verbal representation have to be linearised in order to be transformed both at sentential and textual level into the one-dimensional medium of language (cf. Levelt 1982). When planning and producing a complex piece of discourse these processes operate on both levels, i.e. at the level of macrostructural or global planning and microstructural or local planning, where the latter is embedded in and dependent on the first.

In the following presentation of the empirical results focus is placed on information selection and organisation, in particular on the role of temporal categories in verbal representations of dynamic situations, comparing in detail speakers of different languages.

3. Empirical analyses

3.1. Event cognition

Although the domain of events provides a possible window on the interrelation between perception, cognition, and language, it has not been the subject of many studies in this field. Unlike spatial cognition, temporal concepts do not have a direct correlate in the experiential world, so in contrast to space there is no way of testing orientation in time on a language-independent basis. In conceptual domains where knowledge is mainly acquired through language, as in temporality, modality, or logical relations, the question of language relativity is even more of a challenge for the current debate, and this all the more since languages differ fundamentally in the way time is structured in and through grammar.

The notion of event has been treated extensively in different theoretical frameworks both in and outside linguistics. In addition to philosophical studies on eventhood (e.g. Kamp 1981; Parsons 1990), and psychological work on event cognition (e.g. Newtson 1976), the notion of event is one of the central categories in different linguistic fields, in particular in (logical) semantics and cognitive linguistics. Since this is not the place to enter into an in-depth discussion of the notion 'event' (cf. Klein 1994 for a critical discussion), we will briefly introduce the central theoretical distinctions necessary for the empirical analyses. In this context three levels will be distinguished:

(a) the external world
(b) partial conceptual representations of the external world. Note that these conceptual representations are dynamic in nature, which means that they can be subjected to processes of reorganisation, as in the process of conceptualisation for speaking
(c) linguistic representations (predicate-argument structures)

Most work within the field of (logical) semantics and philosophy of language takes only levels (a) and (c) into consideration. Approaches that focus on psycholinguistic aspects of production, comprehension and acquisition of language are often concerned with level (b) and (c) only. These levels are difficult to operationalise in empirical analysis, a problem

which is reflected in inconsistent use of the theoretical categories. In many psycholinguistic and semantic studies, the distinction between (b) and (c) is not really necessary, since categories at the level of conceptualisation are not operationalised independently of units at the semantic level. In a context which addresses the question of the role of language in processes of conceptualisation – as in the studies at hand – a separation of the two levels is required, however.

If we look at the relation between level (a) and level (b), a one to one mapping cannot be expected. Given a particular situation in the external world, there are many options with respect to the cognitive representation of this situation as an event, and a number of options again in presenting an event linguistically. They concern the level of granularity, the components selected (e.g. bounded/unbounded) for representing the particular situation, as well as the perspective under which the dynamic situation is viewed. There are not only options as to what can be construed in order to meet the requirements which lead to a **reportable event,** but also with respect to the concatenation of events within a **macrostructural temporal frame**, i.e. at text level. Let us illustrate what is meant by 'options' with an example for both aspects of information construal. Taking a situation in which you are presented with a scene with a person on a surfboard, surfing on waves, and are asked to tell an interlocutor *what happens*?: A possible and typical answer in English could be

(1) *A young man is surfing*

A German speaker will say something like

(2) *Ein junger Mann surft auf hohen, schäumenden Wellen*
'A young man surfs on high, foamy waves'

Both sentences relate to the same event, but they differ with respect to information selection and perspective taking. In the English sentence the speaker has selected an argument-predicate relation which is linked to a temporal viewing point that is included in the time of the event. The speaker is making a claim about a time interval at which a phase of an event of the type 'surfing' holds. In accordance with the theory of *Time in language* (Klein 1994), we will call the time span about which an assertation is made the **topic time** TT of a sentence and the time at which the situation holds the **situation time** TSIT. In the German sentence more

information is selected with the provision of spatial information, and the relation between topic time and situation time differs. No topic time interval is specified, rather there is an undetermined topic time expressed by the present tense, which has to be understood as parallel to the situation time. In the example above the German speaker has not selected a particular phase of the event for verbal representation but has given a holistic view of the activity in question.

If the speaker has the task of relating events in terms of a macrostructural frame there is a range of options with respect to what we call **topic time management**. Compare again typical examples of an English and a German text.

Question: What happens in the scene?

(3) a. *A young man is surfing*
b. *The wind is blowing him off the board*
maintenance of topic time

Question: Was passiert in der Szene?

(4) a. *Ein kleiner Mann surft auf den Wellen*
'A little man surfs on the waves'
b. *Dann wird er plötzlich von dem Brett geweht*
'Then he is suddenly blown off the board'
shift of topic time

In the English text, both events are linked to a topic time which can be described as a secondary deictic *now*. The TT is maintained and the events are linked to the TT as phasally segmented (ongoing). In the German text the TT is shifted in that the post time of the first event is taken as the topic time of the second event. In order to fulfil this function the event has to be construed as bounded, and in the present case this is given with the adverbial *dann,* which implies this type of reference point with respect to the preceding event. There are more distinctions and associated options, but we will focus on the relation between time and event structure below in the empirical studies.

Basic assumptions

We assume that the selections which speakers make with respect to these options can be related to criteria which are principle-based, otherwise the

choices made will not have the speed and consistency required in presenting a series of utterances with a coherent information structure. In the course of language production all these decisions have to be taken before the linguistic form is activated. If we assume an 'unintelligent formulator' – a position which has been upheld in models of language production – then all information which is relevant for the final selection of lexical and syntactic form has be provided by the conceptualiser. Our central hypothesis is that the planning processes required for the construction of an information network are rooted in the structural properties of the specific language used.

The languages compared in the empirical studies were selected accordingly and exhibit structural contrasts which are relevant in the domain of event construal and the expression of event-time-relations. They reflect different **tense-aspect** systems, as illustrated in the following figure:

Figure 1. Tense-Aspect

		Arabic	English	Dutch	Norwegian	German
Tense			x	x	x	x
Aspect	Imperfective	x	x	[periphrastic]	[serial verbs]	[lexical]
	Perfective	x	–	–	–	–

The empirical studies were designed to test language specificity in planning the verbal representation of dynamic situations, in particular the role of different verb-morphological systems in relation to information selection and structuring in event construal. We will first summarise findings from language production tasks which have been reported on before: they include film-retellings, which require the verbalisation of a chain of events undergoing macrostructural planning, and the verbalisation of short scenes, a task which can be solved by producing only one sentence (cf. v. Stutterheim 2003). Then we will present the results of two studies which were designed to test the robustness of the crosslinguistic preferences observed when construing content in language production.

Contrastive analyses of text structure

In this task the database (film retellings of a short silent film *Quest*) includes speakers of Arabic, Dutch, and Norwegian, in addition to English

and German (20 speakers per group). The story concerns a single protagonist on his search for water in different desert-like worlds. The data was collected under similar conditions and all speakers were asked to tell *what happened*?

Taking first English and German speakers, there are significant crosslinguistic differences in the events selected for mention, and when speakers talk about the same event they often relate to different aspects. Temporal framing at the macrostructural level draws upon different patterns of topic time management (cf. v. Stutterheim and Nuese in press). The common basis for these differences is given by the temporal perspective taken: German speakers establish an unspecific topic time by introducing the frame by sentences as 'the film begins…', 'in the first episode…'. Then the temporal sequence of events is linked intrinsically. This requires a temporal perspective whereby events are viewed holistically, i.e. with boundaries and therefore endpoints or results of actions. In contrast, in English texts the topic time is related to an extrinsic viewpoint or anchor for the scene, which can be described as what is in the camera's range, so to speak. This view point is maintained and each event is linked anew to this anchor and thus need not be construed as bounded. Events can be segmented or decomposed into different phases, and the temporal perspective point is incorporated into the situation time. In contrast to the German narratives many events are construed as unbounded, as evidenced in patterns of information selection.

In order to illustrate these patterns two typical examples are selected for both language groups.

German
temporal sequence based on bounded events
(relation: anaphoric shift)

(5)
a. *dann sieht sie sich plötzlich auf einem großen Steinberg*
'then it sees itself suddenly on a huge mountain of rocks'
b. *und kann dann nicht mehr runter ohne sich was anzutun*
'and can then no longer get down without hurting itself'
c. *sie schaut sich um*
'it looks around'
d. *und hört dann plötzlich wieder diesen Wassertropfen*
'and hears then suddenly again this waterdrip'
e. *der auf die Steine fällt*

'which on the stones fall'
f. *und versucht dann eben von dem Steinturm abzusteigen*
'and tries then to climb down from the tower of rocks'
g. *fällt das letzte Stück runter*
'falls down the last stretch'
h. *ist etwas benommen*
'is somewhat dazed'
i. *steht dann aber wieder auf*
'gets then up again'
j. *und findet die Wasserlache*
'and finds the pool of water'

As illustrated in the excerpt, complex dynamic situations are segmented in German into a set of events which are presented as occurring in sequence. The sequence is represented on the basis of the temporal relation *y after x,* which is established by explicitly linking the current topic time to the preceding time of event (cf. in detail Klein 1994). This means that the preceding time of situation has to be a bounded event in order to function as a reference interval for a shift in time relation. Bounded events create a 'post time' and with this the conditions for opening up a new interval on the time line (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/shift in topic time). This perspective follows the event line from within, as a participant so to speak. The deictically anchored point of view of the speaker or camera (external view point) does not play a role in constituting temporal structure at the macrostructural level.

In contrast, the following example from the English data shows a pattern of topic time maintenance.

English
temporal sequence based on deictic point of reference *now*
(relation: inclusion)

(6) a. *he's waking up from his fall*
b. *he looks in front of him*
c. *and there's this big piece of paper*
d. *coming straight for him*

e. *and he jumps up onto his knees*
f. *and the piece of paper misses him*
g. *alright*
h. *so he stands up*
i. *and he's walking along … through this plane*
j. *and he hears the drip again*
k. *so he starts running*
l. *and he sees this moist area on this piece of paper*

As the comparison with German shows the actual temporal sequence (was x completed before y started) plays a secondary role in temporal frames of reference which incorporate ongoingness, and is often left to be inferred. The excerpt illustrates relations of inclusion: the time span of the event in (6b) is included in that of (6a), and (6d), for example. The reference point is provided by the deictic *now*: What is happening now? (6a) *he's waking up from his fall*, (and while doing so) (6b) *he looks in front of him* (and while doing so) (6d) *x is coming straight for him*). Similarly, (6e) is included in (6d), and the set is terminated with (6f). This strategy allows speakers to anchor events which are ongoing, and there is no necessity in this temporal frame for one event to be represented as completed or bounded before introducing another one. The actual sequence is often implicit and speakers also exploit other means, such as causal relations (*x leads to y*) to show how events proceed (cf. in detail, Carroll and v. Stutterheim 2003; v. Stutterheim and Lambert in press; v. Stutterheim, Carroll and Klein 2003).[2]

In order to test whether these differences in temporal perspective taking are indeed rooted in the respective grammatical system and not due to differences in culturally determined rhetorical traditions, Arabic (Modern Standard Arabic) was included in the study as a language which shares the grammatical feature aspect with English, but is culturally distant from it.

The case of Arabic

The results of the text analysis are clear-cut: With regard to the selection of perspective, Arabic speakers proceed like English speakers and establish the same type of referential frame. The speakers introduce a deictic, event external *now* and situation times are linked to this point of reference and marked as imperfective.

Arabic

▪ temporal sequence based on deictic point of reference *now*
(relation: inclusion)

(7) a. *tatatāyaru* *l-awrāq*
floating-around (IPV.3SGF) the sheet of papers
'the sheet of paper is floating around'

b. *tatīru waraqatun kabīratun ɛalā weğhi-hi*
flying (IPV.3SGF) one sheet large on face-his
'one large sheet is flying on his face'

c. *fa yasqutu marratan uhra ɛala l-ard*
and so falling (IPV.3SGM) once again on the ground
'he is falling once again on the ground'

d. *walākinna-hu yuhāwilu n-nuhuda min ğadīd*
but -he trying (IPV.3SGM) the getting up once again
'but he is trying to get up once again'

e. *yaqifu*
getting up (IPV.3SGM)
'he is getting up'

f. *yandoro hawla-hu*
looking (IPV.3SGM) around-him
'he is looking around him'

Although there are some important differences in the aspectual systems of Arabic and English, we see clear correspondences with respect to one crucial feature: the global perspective which provides the basis for coherence across the event sequence. Temporal relations based on situation times and their post time are not exploited for the creation of coherence.

The case of Dutch and Norwegian

To complete the picture there are the languages which match the structural features of German, to a certain degree at least, as in the case of Dutch and Norwegian. As indicated in Figure 1 above, Dutch and Norwegian do not have a morphological aspectual system in that the temporal concept of ongoingness is not grammaticised on the verb. As the examples below illustrate, speakers of Dutch and Norwegian select a temporal frame which corresponds to the one observed for all German speakers. There is no aspectual marking on events which form part of the event chain. Temporal

coherence is established through the *shift-in-time* relation, which operates on an intrinsic basis and is expressed by anaphoric temporal adverbs.[3]

Dutch
▪ temporal sequence based on bounded events
(relation: anaphoric shift)

(8) a. *de film gaat over een mannetje van zand dat wakker wordt in 'n soort van woestijn*
'the film is about a little sandman which wakes up in some kind of desert'
b. *hij vindt 'n lege fles*
'he finds an empty bottle'
c. *en heeft waarschijnlijk dorst*
'and is probably thirsty'
d. *dan hoort hij gorgelende water geluiden*
'then he hears the gurgling sound of water'
e. *en begint dan te graven*
'and begins to dig'
f. *en … eh … hij graaft steeds dieper*
'and he digs always deeper'
g. *en zakt plotseling weg de grond in*
'and disappears suddenly'
h. *terwijl hij zich tevergeefs probeert ergens aan vast te klampen*
'while he tries to hold on hopelessly'

Norwegian
▪ temporal sequence based on bounded events
(relation: anaphoric shift)

(9) a. *og det blåser veldig*
'and it blows very much'
b. *og han reiser seg etter hvert opp denne mannen*
'and he rises gradually this man'
c. *og så ser seg rundt*
'and then looks around'
d. *og det blåser sånne pappbiter på'n hele tida*
'and it blows such cardboard pieces on him the whole time'

e. *og så går'n litt bortover*
'and then walks he along'
f. *og så ser'n plutselig en / en våt flekk*
'and then sees he suddenly a wet spot'

The results across all text corpora can be shown to converge: The clusters formed with respect to patterns of event construal correspond to the clusters given on the basis of morphological aspect. Arabic and English seem to rely on comparable principles when construing events within a macrostructurally framed chain (cf. in detail v. Stutterheim and Nuese in press), just as German, Dutch and Norwegian speakers do. These results led to the rejection of cultural traditions as an explanation for these differences and can be taken as support of our hypothesis of structurally induced principles of information organisation.

3.2 Macrostructural planning and 'considering what to say' in narrative tasks

In addition to the structure of temporal frames, a study was carried out which investigated macrostructural planning when 'considering what to say' for the same narrative task. The same elicitation technique was used (recount the content of the film Quest) and the Dutch, English, and German corpora were supplemented by data from speakers of the Romance languages Italian and Spanish (20 per group). As mentioned above, the story concerns a single protagonist on the quest for water in desert-like worlds (a desert, paper world, world full of stones, and a world run by machines). So there are two types of information that can be distinguished in the film:

(a) information which relates to the protagonist and what he undertakes in his quest and
(b) information concerning inanimate entities which he encounters (environmental forces – wind, sand, water, rocks, machines).

Since all speakers will be bound to say something about the actions of the protagonist we did not expect crosslinguistic contrasts with these components of the retellings. In pursuing the question whether there are language specific differences in 'what to say' we focused on the extent to

which speakers select information involving a minor category of events. The question is do speakers of all languages refer to the same entities to a similar degree when selecting information on dynamic situations? The cases counted relate to all types of entities in a dynamic role:

Inanimate forces:	***water*** *is dripping down*
	a rock *is heading towards him*
Protagonist:	***the clay figure*** *disappears into a new world*

Inanimate entities are relevant in information selection since they are often involved in events which are not bounded and thus do not deliver on the conditions required for a shift in topic time (*water drips down / is dripping down, the wind blows / the wind is blowing*). References were counted irrespective of the way they are mapped into form since we are dealing at this point with information selection. In a sentence such as *he is being pushed up by a rock,* for example*, the rock* is the relevant force in the situation, and formulations of this kind were counted as a selection in which an inanimate entity is placed in a dynamic role.

The results show that frequency of reference to inanimate forces in a dynamic role is similar in English, Italian, and Spanish and amounts to 34.5 in English, 37.1 in Italian, 30.9 in Spanish. But there is a significant drop in German to 24.5 (average percent for 20 speakers in each group) as well as Dutch at 23.6. The difference between speakers of German and Dutch in contrast to the other languages is statistically significant: t-test English – German $p = 0.006$ significant; Spanish – German $p = 0.04$ significant, while English – Spanish $p = 0.25$ is not significant (cf. in detail Carroll and Lambert 2003).

Speakers of Dutch and German tend to focus attention in their narratives on the protagonist, often omitting reference to prominent inanimate forces. This is exemplified in a breakdown of the above figures for some of the individual scenes, comparing values for German and English. One scene in which the protagonist is exposed to an inanimate force is the encounter with a huge rock which can be seen dropping from the sky. 90.0 % of the speakers of English refer to this incident, while only 45.0 % of the German speakers do so.

Table 1. Inanimate force: Scene with rock falling from cliff and heading straight for protagonist who is lying underneath

the first thing we see is a huge rock dropping from the sky directly towards his head

English	18/20 speakers	90.0
German	09/20 speakers	45.0

Table 2. Inanimate force: water dripping down onto paper

the water is dripping onto this piece of paper and is making the paper wet

English	17/20 speakers	85.0
German	08/20 speakers	40.0

In German situations which are more likely to be selected for mention are those in which the inanimate forces have serious consequences for the protagonist and the event in question is viewed as bounded, and thus meets the precondition for temporal shift.

Table 3. Inanimate force: sheet of paper knocks protagonist down

English: *Its very windy with a lot of paper and a very big sheet hits him in the face and knocks him down*

German: *er wird niedergerissen von einem Papierstück*
('he is knocked down by a piece of paper')

English	16/20 speakers	80.0
German	12/20 speakers	60.0

Discussion

One possible explanation for the lower frequency of mention of inanimate forces in German and Dutch, compared to English, is given by the role of temporal relations in the frame of reference used to link events in time, as expressed by forms such as *dann (then*). Events which are linked via anaphoric shift entail a change in state and are typically associated with an animate protagonist acting intentionally in the world in question, as indicated above. Events which do not involve a change in state (water drips) do not meet the criterion which allows specification of a shift in topic time and this applies in many cases to the inanimate forces. Omission in

information selection may in part be attributed to this factor in Dutch and German.

Coming back to the role of grammatical form in guiding speakers in the choices made, the question is does this pattern bear on grammatical form beyond the presence or absence of grammatical means which code ongoingness? At the level of word order both Dutch and German share a specific grammatical constraint whereby only one constituent may precede the finite verb in main clauses (verb second or V2 constraint on word order). This constraint is relevant in narratives since it accords prominence in the assignment of 'topic' status to constituents which map into the slot preceding the finite verb (Vorfeld). In narratives these are temporal adverbials such as *dann* as in *dann steht er auf* (then stands he up). This factor may operate in conjunction with the absence of grammatical means which code ongoingness and lead speakers of Dutch and German to focus on a specific type of dynamic role when selecting information for expression in a narrative task. The relevance of the V2 constraint, in addition to the grammaticisation of ongoingness, was tested and confirmed on the basis of comparisons with French, but an adequate discussion of the results goes beyond the scope of the present paper, however (cf. in detail Carroll and Lambert 2003).

In summary, the data were included in the present context in order to show that speakers differ on a cross-linguistic basis in the type of information which is selected for mention when 'considering what to say' as well as in the macrostructural frames of reference which they establish in linking events in time, and in both cases the patterns observed can be linked to grammatical form.

Based on these findings, a series of follow-up studies was carried out, in addition to the narrative tasks, in order to test whether the contrasts observed hold only as text phenomena, or whether they are also evident in the verbalisation of individual events in decontextualised situations.

3.3. Contrastive analyses of the verbalisation of single events

The design was as follows: English, Dutch, Norwegian, Arabic, and German speakers (20 per group) were shown a series of video clips which depicted a variety of situations. In some of the items the situation shown depicted the initial and intermediate phases of the event, in other words, the endpoint of the event was not shown, but could be inferred.

The subjects were asked to tell *what is happening?* and that they should start as soon as they recognised the type of situation. Their utterances were tape recorded and categorised by three independent observers as to whether the event was bounded or not. The category 'bounded event' included those which contained reference to an endpoint/goal of a motion event or a goal /result of an action. They were expected to elicit differences with regard to the mentioning of endpoints. Then there were items where no differences with regard to the mentioning of endpoints were expected. These were items where all speakers were expected to select the same components for verbalization, as in ongoing activities like 'someone is milking a cow'.

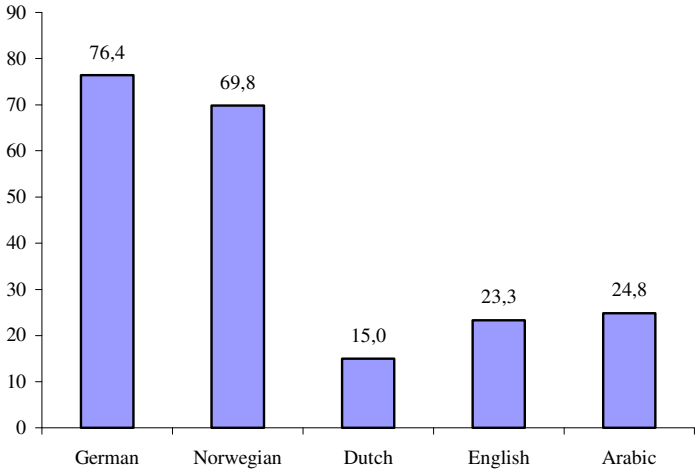
The results showed no crosslinguistic differences with respect to items belonging to the latter group. The critical items (+/– endpoint) revealed that in these cases German and Norwegian speakers tend to construe a possible endpoint while speakers of Arabic and English are unlikely to do so. For purposes of illustration some of the individual situations described in the data are given below:

Figure 2. Verbalisation of single events

	English	German
– endpoint	*two nuns are walking (down a road)*	*zwei Nonnen gehen spazieren*
– effected object	*a stone mason is chipping away*	
+ endpoint	*two nuns are walking down a road towards a house*	*zwei Nonnen laufen auf einem Feldweg in Richtung eines Hauses*
+ effected object	*a stone mason is sculpting some kind of stone decoration*	*ein Mann formt einen Kopf aus Stein mit einem Meißel*

The following overview shows the frequency with which endpoints are mentioned over 18 situations, taking the average values for 15 speakers in each language (giving 270 possible mentions per group).

Figure 3. Endpoints mentioned (overview for 5 languages)



The results reveal language clusters which fall in line with the retelling study – with Dutch as the only exception. In accordance with the principles underlying event construal at discourse level, Norwegian and German speakers construe events under a holistic perspective. Endpoints are expressed, even if they have to be inferred or invented. Arabic and English speakers on the other hand encode phases of the events depicted, so in those cases where the beginning or intermediate phase of an event was shown in the video clip their codings do not include an endpoint (cf. v. Stutterheim and Nuese in press).

So far the results dovetail with the previous findings. The Dutch data, however, do not conform to the hypothesis. Interestingly, speakers behave in this task as if they were a member of the aspect group and the forms used for expression include a large number of aspectually marked predicates: e.g. *twee jongens zijn aan het tafeltennissen* ('two boys are playing table tennis'), *mensen die aan het duiken zijn* ('people who are diving'). The events depicted are frequently decomposed, i.e. only one phase of the overall event is selected for expression and endpoints or results of the actions do not come into the picture. In terms of the components chosen when representing a given event, Dutch clusters with the group of the + aspect languages. It still remains an open question, however, as to why Dutch speakers proceed differently in construing events in contextually embedded and context-free situations.[4]

Contrastive analysis of speech onset times

These findings, which support our initial structural hypothesis, were tested further by measuring speech onset times of speakers from different languages – the assumption being that if German speakers need an endpoint in order to provide the conceptual correlate of what can be coded as an event, they will wait for the event to become evident as a whole before starting to speak. In contrast, speakers of English, which codes the aspectual distinction of ongoingness grammatically, can describe any phase of an event in its own right (onset, nucleus, terminative phase) and therefore do not have to wait for the endpoint or result of an action.

13 German and 13 English speakers were presented with the same set of video clips, and were asked to tell *what is happening? was passiert?* Both groups were told that they could begin as soon as they recognised the type of situation. The session was video recorded, and speech onset times for the 28 test items were determined by measuring the onset of the sound wave in the digitalised version of these recordings. The results show that on average German speakers started speaking 4.54 seconds after stimulus onset (i.e. after the beginning of the video clip), while English speakers started about one second earlier, namely 3.51 seconds after stimulus onset ($t_{1(24)} = 3.13$, $p = .004$; $t_{2(27)} = 10.71$, $p < .001$). This means that in order to get a reportable event, German speakers indeed wait longer, while English speakers are able to verbalise an ongoing event such as *someone is walking* without having to figure out the endpoint (where the person is heading, for example). The results thus confirm what was found in the analyses of the verbal tasks: In providing the basis for a reportable event, German speakers show a clear preference for a holistic perspective, and this means waiting until the scene as a whole has unfolded before starting to speak. In contrast, any phase constitutes a reportable event for English speakers.

This conclusion is also supported by an eye-tracking study which is currently underway: While German speakers focus on the endpoint of an action before starting to speak, English speakers start to speak before focusing this region on the screen. Although this study is still in progress, the results also show that German speakers already look for the endpoint of an event when they conceptualise the event in question, thus indicating that 'thinking for speaking' comes into play at a level in language production at which speakers construe the cognitive correlate of a visually perceived situation.

3.4. Changing perspectives

The results of the different production tasks show that speakers of different languages prefer one pattern of conceptualisation over another in language production. While this does not mean that there is a deterministic relation between linguistic structure and conceptual representation, there are clear **preferences** for a specific option. As the data shows there are alternative options which are in fact chosen by some speakers. Given the fact, however, that one pattern of information organisation is selected by a clear majority across all tasks (in some cases by 100 % of the speakers) within a language group, this provides clear evidence that there are specific patterns in organising content for expression which prove to be a better 'fit' for a specific structural profile.

In order to test the robustness of these preferred patterns we designed two follow-up studies. On the basis of the same stimulus material (*Quest* for the first study and single dynamic situations for the second (study 2), speakers were confronted with task requirements which excluded selection of the preferred options. We assumed that if speakers follow what may be a *default* pattern of information organisation in a given communicative situation which is related to language structure, then they should have problems when required to abandon this *default*. If they readily switch to a different pattern, however, then the assumption is called into question.

Shift of temporal perspective: film retellings (Quest 7)

In the first study the film retelling task was repeated with 20 speakers of English and German. This time the subjects were confronted with tasks requirements which do not conform with the preferred pattern. In the first task speakers of both languages automatically retold the content of the film in the present tense, even though they were asked to tell '*what happened?*'. So instead of leaving the speakers free to tell the content in the present we asked them to take a perspective which treats the events as having occurred in the past. Given the results of the first film retelling study (cf. 3.1.), and the assumption that the different strategies of event construal selected are optimally suited for the respective system, we expected speakers of German and English to have different sets of problems when required to select a temporal perspective which views events in the film as anchored in the past. English speakers who typically select a deictically anchored referential frame (*now*) with topic time maintenance in film retellings should run into difficulties, since this principle will not work in a past time

frame, given the fact that speakers will have to switch to a substantially different system of temporal linkage. German speakers, on the other hand, who exclusively relate events in the film retellings by means of the principle of temporal shift (*dann, then*), should have less problems in changing to a past time frame, since the principle by which events are linked is similar across both tasks.

Speakers of English

Let us summarise the findings for the English data, where speakers were asked to present the film events in a past time frame (cf. in detail v. Stutterheim, Carroll and Klein 2003). The texts obtained show that speakers try to comply with the instruction. They did not ignore the task requirement and revert to the preferred temporal frame. Speakers establish anaphoric links, relating the topic time to a preceding situation time. However, the shift in perspective was incomplete and information organisation follows a hybrid pattern in that features of a frame anchored in terms of the experiencer's *now* are partially reconciled with the requirements of a past time perspective which has no place for this anchor. This results in a number of inconsistencies in form-function-relations as well as in thematic discontinuities, and a comparatively large number of self corrections. Evidence for problems at the level of information organisation can be drawn from a number of areas, such as tense switch, tense self corrections and a functionally inconsistent use of -ing forms.

Comparing *Quest 1* and *Quest 7* texts on a qualitative basis, we will begin with evidence for the maintenance of some basic features of a deictic strategy (*now*) in the English *Quest 7* narratives. The indicators found will be illustrated by examples. The first indicator concerns processes of information selection: Ex. 11 from the *Quest 1* corpus illustrates once again the referential frame found in narratives told in the present tense. The temporal aspects of the events relate some sub-interval of the situation time to the topic time and therefore do not need reference to an endpoint or boundary of the situation time. The situation time intervals and their intrinsic relation remain implicit:

Quest 1

(10)	a.	*so he starts digging in the sand towards*	(ongoing)
	b.	*where he thinks he hears the water*	
	c.	*and as he digs*	
	d.	*and digs the sand / through the sand*	

e.	*he starts digging a hole*	(ongoing)
f.	*and he starts sliding into*	(ongoing)
g.	*what looks like dry quicksand*	
h.	*and he starts falling into the hole*	(ongoing)

There is a marked contrast to *Quest 7* texts in that the narratives in the past tense, with a similar degree of resolution, consistently present ongoing events as reaching a point of termination. The comparison between the *Quest 1* and *Quest 7* narrations shows that in the latter case speakers attempt to express closure not just for the coda or final phase (*ended up falling*) but very often for events which form the onset and nucleus (*began digging but after a very short time ...; kept digging and eventually ...*; etc.). This difference is illustrated by examples 11 and 12. At the end of the scene they close the sequence by explicitly anchoring the last event either as a temporal endpoint (ex. 11g) or as a causal result of the preceding discourse (ex. 12c–d). Note that events which form part of the story line are mapped into a subordinate clause in this function (*until he sunk*), a packaging phenomenon which is due to the hybrid character of the perspective selected and which is not found in spontaneous past time narratives (taking the very few that occur 3 out of 38 narratives).

(11)	a.	*he looked up at the sky*	
	b.	*to see if there were rain clouds*	
	c.	*but didn't see any*	
	d.	*so then he dug in the sand*	
	e.	*he kept digging*	
	f.	*and digging*	
	g.	***until he sunk***	(closure)

(12)	a.	*he started to dig around*	
	b.	*and like a cat kind of eh throwing up the sand behind him*	
	c.	*and he dug* ***so hard***	
	d.	*that* ***he fell through into a different kind of equally desolate world***	(closure)

The problem of providing an anchor point for a shifted topic time can also be solved by adding an explicit temporal shifter such as *then* or *a moment later,* or by introducing some indefinite anchor point through a temporal adverb such as *suddenly*.

(13) a. *so he got up*
b. *and went in search of the source of this sound*
c. *and he began digging in the sand*
d. *and **after a very short time** of digging*
e. *he fell through some sort of hole in the sand*
f. *and **moments later** found himself on another level of consciousness / or another plane*
g. *as he was lying on the ground*
h. *he again heard the sound of water dripping*
i. ***then** he found the spot*
j. *where in fact water was dripping*
k. *and again fell through the hole*

The number of adverbials used in this function increases in Quest 7. There is also evidence that speakers switch back to the preferred referential frame given by tense shifts from past tense to present tense in utterances which refer to events in the story line. The example below illustrates this problem in maintaining a consistent referential frame.

(14) a. *so the creature **starts /***
b. ***started** to dig in the sand*
c. *and **he's pushing** the sand around /*
d. *he **was pushing** the sand around with his hands*
e. *and digging a space out around him*
f. *when suddenly he fell through the sand down to another level*

The tables below give the frequency of tense shifts and functionally unmotivated switches to the present tense.

Table 4. English Quest 7: Relative frequency of tense forms

present		past		total number narrative utterances
simple	progressive	simple	progressive	
165	35	1187	204	1591
10.4	2.2	74.6	12.8	

Speakers of English try to comply with the instruction and use past tense forms but they do not maintain the required shift in temporal frame.

Speakers of German

In clear contrast to English, speakers of German have no difficulties in implementing the past time referential frame and complying with the instruction. All 20 speakers select past tense forms as their dominant tense. Given below is a typical example from the German corpus.

(15) a. *also ein kleiner Mensch aus Knete erwachte in der Wüste*
'okay a small man made out of plasticine woke up in the desert'
b. *und sah neben sich eine Wasserflasche*
'and saw beside him a bottle of water'
c. *er hob sie auf*
'he picked it up'
d. *schüttelte*
'shook it'
e. *und nichts kam raus*
'and nothing came out'
f. *er setzte sich auf*
'he sat up'
g. *und schaute um sich*
'and looked around'
h. *und sah nur Wüste*
'and saw only desert'

Switches to the present are less frequent in the German retellings as compared to English, as table 5 shows.

Table 5. Relative frequency of tense forms

	present tense forms	past tense forms
English	12.6	87.4
German	2.7	97.2

Looking at the distribution of the switches to the present tense in German across subjects, we see that most of the occurrences are produced by 4 speakers, and the dominant tense for those speakers is the Perfekt and not the Präteritum. So we cannot speak of unstable patterns of TT management in this case, unlike in the English retellings.

Most of the German texts are consistent in their use of tense forms in that those which exhibit tense switches remain within a constant frame of reference. This contrasts clearly with the English data. The results confirm our initial hypothesis that depending on the nature of the preferred macrostructural pattern for temporal frames of reference, shifts in perspective prove to be more or less difficult to perform.

Shift of temporal anchor: event construal

The second study which tested the robustness of the default strategy was carried out with English speakers only. Stimulus material and design were the same as in study above where speakers were asked to verbalise a series of single dynamic situations. It was necessary to test whether the crosslinguistic differences observed were not attributable to differences in the way the task was formulated in the different languages, since "ongoingness" is not coded on the verb in German, and thus cannot be imparted in the instruction in the same way. So the introductory question was modified and subjects where not asked to tell *what is happening in the scene*? but *what happens in the scene?*. There were two groups of English speakers, one answering the question which is typical in a context of this kind – *what is happening?* while the second group was asked *what happens?*. In this case the feature of ongoingness is omitted, and corresponds in its form to the question posed in German *was passiert*?

(a) English (15 speakers) asked to tell *what is happening*?
Use of -ing form: 100.0
(b) English (15 speakers), same scenes, but asked to tell *what happens*?
Use of -ing form: 97.3

Use of the -ing form is still very high at 97.3, and patterns of event construal, involving phasal segmentation and mention of endpoints, compare to the initial study. These results confirm that the pattern of conceptualisation selected is not dictated by the question used in the instruction and that speakers of English typically apply the concept of ongoingness when coding information on individual dynamic situations in tasks of this kind.

Discussion

The studies presented above illustrate the crosslinguistic differences, and we now come to the factors which determine this overall picture. The relevant structural property in the case of temporal frames of reference in narratives lies in the categories grammaticised in the verbal system, as mentioned earlier. The main differences between the verbal systems in German and English are given by aspectual categories and not by tense. Aspectual categories are bound to a viewpoint (cf. Comrie 1976; Klein 1994) and can be expected to have consequences for the construal of events in actual language production. English has a marked grammatical category for ongoingness (imperfective) which is not constrained with respect to temporal location, and a perfective aspect constrained with respect to the temporal anchor, which is deictic. The imperfective aspect requires an external reference point, a topic time in relation to which a situation is viewed as ongoing. This can be the now of an experiencer, as outlined above for film retellings.

German speakers in contrast do not have a grammaticised imperfective aspect which codes events as ongoing (*it is now the case*). The grammatical means available in German for aspectual marking predominantly encode the perfective viewpoint[7]. The observed focus in film retellings on the post state of a situation provides the grounds for anaphoric shift in topic time management. There are occasional switches to the deictic anchor *now,* which is expressed mainly in lexical terms, but these, however, do not affect the status of the overall temporal frame.

The results presented above confirm the hypothesis that speakers develop specific principles in the construction of referential frames, and the

types of event-time relations which they incorporate correlate with the grammaticised means which are available in the language. Speakers of German do not set up a global frame of reference (i.e., which holds for the narrative as a whole) that is anchored in respect of an external viewpoint. The grammaticised means which facilitate this on a systematic scale are absent. The results for the German narratives were confirmed by the comparisons with Dutch and Norwegian, which share similar structural features with German. Arabic and English share the same grammatical feature (progressive aspect, imperfectivity) and speakers follow similar principles in selecting information for expression in the tasks studied. In contrast to individual events, macrostructural planning in narrative tasks requires overreaching principles that relate to defined features in a temporal frame on a consistent basis, such as the coding of endpoints or boundedness. At the level of macrostructure the speaker has to integrate decisions with respect to very different aspects of information organisation – consistency in the temporal frame used to link events, coherence in weighting and packaging information, in other words, the treatment of all components in information structure in coherent terms.

These crosslinguistic contrasts are not trivial since speakers are, on the whole, bound by the logic of a consistent frame in order to ensure the basic requirement of text structure – its coherence. The crosslinguistic differences thus lie in the overall referential frame which speakers establish, and there is a logical interrelation between the type of temporal relations selected and specific patterns of event construal. It seems that once these principles are established, they are applied in 'thinking for speaking' processes in general. This would explain why similar results were obtained with the single event experiments.

4. Conclusions

What is the status of grammatical form as a determining factor with regard to preferred patterns of conceptualisation in language production? We will first pursue the question as to the advantages gained in having sets of constraints or preferred patterns of conceptualisation at the level of macrostructural planning. Speakers of German, for example, could decide to forgo the preferred options and construe a set of dynamic situations with events which are not viewed as bounded. In formal terms there is nothing in the language to prevent a speaker from doing so and let us consider briefly

what this option would entail. Going back to the grammatical V2 constraint as a starting point, in dynamic situations speakers would have to find another temporal category, other than those which code a temporal shift, since use of a form such as *dann* on consistent scale either presupposes or drives the construal of events as bounded. The data base on German shows that in the few cases where speakers forgo this option the means selected is the spatio-temporal form *da* (*there*). Obviously the V2 constraint is unbiased in this regard, since it merely provides a slot in preverbal position that has to be filled. If *da* is selected it is important to note that this does not imply temporal shift, and events are not construed as bounded or as occurring in a defined temporal sequence. Decisions of this kind go hand in hand and provide an example of sets of factors in information organisation. Concatenations of factors of this kind lay the foundations for the constraints observed in temporal frames of reference. They are not defined in ad hoc terms but proceed on a principled basis, as reflected in patterns of event construal in the tasks studied.

At a grammatical level all options could come together on an ad hoc or random basis since there is no formal factor which would dictate that *dann*, for example, should be used more frequently than *da* when linking events in context. In other words, the preferred selections in information organisation reflect processes of optimisation which cannot be attributed on a causal basis to formal criteria. The options, as a set of factors, are selected with regard to the task in hand and native speakers slowly learn that they are binding – as a set. So how do these come about? One of the principles which is evident in all patterns of information structure across all the languages studied is that of consistency or coherence. Consistency does not mean that speakers keep to a single organising principle or maintain a single perspective in carrying out a communicative task; consistency does not obviate the need for changes, but where changes from one pattern or perspective to another occur, we see that information organisation follows on in principled terms. The decisions made proceed on an implicational level of the type ‘given x then y’. If speakers use temporal shift markers for instance then this entails the construal of events as bounded. This has consequences, of a consistent nature, at all levels in the production process. In other words each set has an internal structure which is not random. It should be emphasised that need to make some choice, however, is driven by the grammatical system – satisfy the V2 constraint and fill the preverbal slot.

The existence of a **preferred pattern of conceptualisation and a preferred set of coding options** shows that a language community has developed a 'consensus' on the given set of coding options at their disposal and what they entail in carrying out specific communicative tasks (e.g. temporal shift in a narrative context). This development has proceeded on a diachronic basis and the learning process in first language development which results in the acquisition of those principles which guide conceptualisation continues well into our teenage years.

4.1. Where do we stand in the debate?

What relevance do these findings have for the language and thought debate? As outlined in the introduction, the debate distinguishes two levels at which thinking takes place: the level of thinking for speaking and a level of thought which is independent of speech. Starting with thinking for speaking we can conclude for the present studies that processes at this level are language-specific and grammatically driven. Although no studies were conducted on a systematic scale in the present context with respect to thinking beyond language use, we will briefly consider the implications of these results with respect to the nature of the knowledge structures involved.

Their relevance has been tested in a series of studies on second language acquisition and document a consistent lack of success in achieving native-like proficiency with respect to the acquisition of preferred patterns of conceptualisation. The present studies of second language development show that learners approach the task of communicating in the second language with the help of those principles which hold in their first language, and despite continuing processes of reorganisation, there is clear evidence that they remain bound by some of these principles at very basic levels, even at very advanced stages of acquisition. These observations provide evidence of the nature of these knowledge structures and their impact on the development of other systems, in the form of a second language, when thinking for speaking. Second language acquisition entails a lengthy process of reorganisation not so much with respect to the concepts involved but in unravelling their actual role, in relational terms, within the system *(*cf. Carroll and von Stutterheim 2002; Stutterheim and Lambert in press; Carroll and Lambert 2003; Carroll, Murcia Serra, Watorek and Bendiscioli 2000*)*.

These results are relevant for the debate on language and thought, since they bring into focus some of the largely unquestioned presumptions in this context concerning language and linguistic knowledge. As shown by many recent analyses, issues in the language and thought debate are open to careful study. But given some of the current presumptions on the nature of linguistic knowledge, empirical results are often not viewed for what they are, as convincingly argued in Levinson (2003). The present empirical studies underline the role of grammatical structure at the level of conceptualisation and draw attention to the relevance of structural features in language production, not only across different language groups (Germanic, Romance, and Semitic) but also within them. We assume that the constraints which these structural features entail serve to facilitate language production processes with respect to central factors such as speed and coherence. Structural factors of the kind described are relevant to the debate on thought and language since they shed light on a basic property of language and linguistic knowledge. The studies illustrate the way in which grammatical form is binding for the speaker. Moreover, they help pinpoint areas which can be investigated on an empirical basis with respect to their impact on thinking beyond language use.

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Endnotes

1. This question has not really been addressed by Levinson and Gleitman, although their respective positions imply hypotheses about this level.
2. Taking all the retellings (38 speakers of English) there are 6 who do not follow this strategy but establish temporal frames which include a strictly defined temporal shift (as in German). As the respective number of speakers indicate, however, this is not the preferred option in this context.
3. Parallel results were obtained in a study on Swedish speakers, also using the film *Quest* as stimulus material. They confirm our hypothesis on the role of linguistic structure in information organisation since Swedish and German match in the critical component – temporal verbal categories (cf. Noyau et al. 2003).
4. It is not the topic of the present paper to discuss this question. But let us indicate the direction where we expect to find an explanation. Dutch gives an example of a developing aspectual system. At present we can witness where the aspectual form enters the system: these are contexts which are semantically and pragmatically constrained. The perspective is deictically anchored and the events are of the activity type. Extensions to other situations can be observed for individual speakers and – to a larger extent – with young children. This corresponds to results from studies on grammaticisation, where it is argued that new grammatical forms come into a system semantically motivated and therefore constrained in range of applicability. In the course of development forms become de-semanticised and less contextually constrained.