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The pre-linguistic basis of grammaticalisation: a unified approach to metaphor and reanalysis

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The pre-linguistic basis of grammaticalisation

A unified approach to metaphor and reanalysis

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Traditionally, grammaticalisation has been described as being based on phenomena specific to language such as metaphorical extension or reanalysis. This characterisation is somewhat in contrast to claims that grammaticalisation is involved in the much more general process of the initial emergence of language. In this article, we provide a unified analysis of both the metaphor-based and the reanalysis-based account of grammaticalisation which is grounded in the cognitive mechanisms underlying ostensive-inferential communication. We are thus able to show that the process of grammaticalisation is an instantiation of a domain-general pre-linguistic phenomenon.

1. Introduction

The way grammaticalisation has been dealt with in historical linguistics and in evolutionary linguistics is somewhat paradoxical. In historical linguistics, it is usually described as a highly specific linguistic process (Givón 1979; Bybee et al. 1994; Haspelmath 1998; Hopper & Traugott 2003), whereas in evolutionary linguistics, it is frequently invoked as an explanation for the emergence of language in general (Heine & Kuteva 2002a, 2007; Hurford 2003; Tallerman 2007). But an account of the origins of language must necessarily transcend its explanandum and provide explanations that are based on mechanisms more basic than language.

Grammaticalisation denotes the (unidirectional) process by which a discourse strategy, syntactic construction, word or morpheme loses some of its independence of use and becomes more functional in its meaning. It can be characterised as a process of semantic bleaching and generalisation accompanied by phonological reduction. Two major types of explanations have been suggested for this process in the literature: one identifies metaphorical extension as the origin of grammaticalisation (Heine et al. 1991), the other one the phenomenon of reanalysis (Hopper & Traugott 2003). Common to both approaches, however, is that they

describe grammaticalisation as a relatively high-level, language-specific process. The claim that grammaticalisation constitutes one of the sources of the emergence of language in the first place (Heine & Kuteva 2002a; Hurford 2003) therefore presents somewhat of a contrast to the way it has been described in historical linguistics. Recently, it has thus even been questioned whether the process of grammaticalisation can really live up to this claim (Newmeyer 2006; see Heine & Kuteva 2007: 49–53 for a response).

In this article, we provide a unified analysis of both the metaphor-based and the reanalysis-based accounts of grammaticalisation; this unified analysis is grounded in the general cognitive mechanisms involved in ostensive-inferential communication. We are thus able to show that the process of grammaticalisation constitutes — contrary to how it has traditionally been characterised in historical linguistics — a domain-general pre-linguistic phenomenon. Our account is thereby in line with the recent shift of focus to the cognitive underpinnings of language change (for an overview of this line of research, see e.g. Evans & Green 2006) and calls for a more cognition-oriented study of grammaticalisation (Heine 1997; Kuteva 2001; Tomasello 2003) :

“Exactly how grammaticalization and syntacticization happen in the concrete interactions of individual human beings and groups of human beings, and how these processes might relate to the other processes of sociogenesis by means of which human social interaction ratchets up the complexity of cultural artefacts, requires more psychologically based linguistic research into processes of linguistic communication and language change.” (Tomasello 2003: 103)

By providing a cognition-oriented analysis of grammaticalisation, this article also relates to a number of more recent studies that explore the links between language change and language evolution (see e.g. Eckardt et al. 2008; Cooper & Kempson 2008).

The remainder of this paper falls into two main parts. We first identify the cognitive underpinnings of both the metaphor-based and the reanalysis-based approaches to grammaticalisation. In the second part of the article, we then project these cognitive mechanisms to instances of pre-linguistic ostensive-inferential communication. We conclude with a brief discussion of the implications of our approach to both the study of grammaticalisation and language evolution research.

2. A unified approach

In the following discussion of the cognitive foundations of the metaphor-based and the reanalysis-based account of grammaticalisation, we use the example of the

English construction *be going to* to illustrate our analysis. The grammaticalisation of *be going to* is one of the most-cited examples in the grammaticalisation literature (Heine et al. 1991; Kuteva 2001; Hopper & Traugott 2003; Evans & Green 2006), and is also a particular instance of grammaticalisation which is very common, both historically and cross-linguistically (Heine & Kuteva 2002b). Originally, *be going to* stood for SPATIAL MOTION but later it came to express INTENTION and FUTURITY, as shown in example (1).

- (1) a. We are going to Windsor to see the King. (MOTION)
 b. We are going to get married in June. (INTENTION/FUTURITY,
not MOTION)

(examples from Bybee 2003: 147).

However, before we can move on to discuss the accounts of the grammaticalisation of *be going to* proposed by the metaphor-based and the reanalysis-based approach respectively, it is necessary that we provide a brief introduction of the notion of ostensive-inferential communication and its cognitive underpinnings, on which our analysis will be based.

2.1 Ostensive-inferential communication

Ostensive-inferential communication builds on the awareness of common ground. Common ground is knowledge which two interlocutors recognise as being shared in a given situation.¹ It implies (i) that the interlocutors recognise the said knowledge as shared, (ii) that they are aware that the other interlocutor recognises it as shared too, and (iii) that they realise that the other interlocutor also knows that they are aware of this (Lewis 1969; Clark 1996; Sperber & Wilson 1995). On the basis of common ground, communication can be established through an *ostensive* act performed by the communicator (a modification of the physical environment which constitutes an enhancement of the interlocutors' common ground)² and an *inferential* act performed by the addressee but predicted and invited by the communicator (the inference of some new information on the basis of the now altered context). The ostensive act communicates the speaker's communicative intention, by being recognised as unusual, and triggers the inferential act, in which the addressee attempts to infer the speaker's informative intention, as described by LaPolla (2006) and others.

Two special types of common ground deserve to be mentioned explicitly here. First, it is essential, for ostensive-inferential communication to be possible, that the interlocutors find a shared understanding of the assumed goal of a given interaction — which in turn builds on some understanding of each other's intentions (Tomasello et al. 2005). Such knowledge of the interactional goal enables

the interlocutors to determine what is relevant in the context of that interaction; a piece of information is relevant if communicating it to the addressee would contribute to achieving the assumed goal of the interaction. Second, linguistic communication additionally makes use of yet another special type of common ground knowledge: the awareness of shared linguistic conventions. In accordance with construction-based approaches to grammar, we understand such conventions as symbolic associations between forms and meanings (e.g. Langacker 1987; Croft 2001).

2.2 The metaphor-based scenario

Before we sketch the metaphor-based scenario of grammaticalisation, it seems appropriate to specify how we conceive the notion of ‘metaphor’. What most definitions developed by metaphor theorists have in common is the core idea that metaphorical language use denotes situations where an extant linguistic form is used (“transferred” in the sense of the original Greek *metaphéreîn*) to express a meaning (its “metaphorical meaning”) which is similar, but not identical, to the one that form is conventionally associated with (its “literal meaning”) (Kövecses 2002). Metaphor is thus a form of analogy (see e.g. Hopper & Traugott 2003: 93, Fischer 2007: 122, Itkonen 2005: 41). Lakoff & Johnson (1980) refer to the conventional meaning involved in a metaphor as its ‘source’, and to the novel meaning it is used for as the ‘target’. The metaphorical use of a source is possible if the semantic components that pertain only to the source but not to the intended target are irrelevant in the respective usage situation. Not all metaphors are thereby easily recognised as such. A metaphor is more conspicuous if the source shares only very few conceptual properties with the target, and less conspicuous if source and target are almost identical. Example (2) shows a very obvious case of metaphorical language use. The source (the ‘chameleon’) has only very few properties that also occur in the target: Sally and chameleons share their habit of frequently changing their appearance. Other features of the source, like e.g. the property of having a long tongue or the fact that chameleons are reptiles, are ignored if it is evident that they do not contribute to what the speaker plausibly wants to communicate in the given context.

(2) a.	Sally is a chameleon.	(source)
b.	Sally frequently changes her appearance.	(target)

We hold that there is no clear-cut distinction between literal use and metaphorical use but that the two rather form a continuum. Instances of literal or metaphorical use only differ in the degree of similarity between the conventional meaning of the used linguistic form and the meaning it is used to express. This view that

literal use and metaphorical use — in fact any figurative language use — constitute a continuum, is advocated, for example, by Langacker (1987: 69f.), Sperber & Wilson (1995: 231–37), Carston (1997), Croft (2000: 99–114) and Wilson & Carston (2007). Metaphorical use is thus not only the basis of what we perceive as poetic language but also occurs in the small-scale deviances from convention that are ubiquitous in ordinary every-day talk (Deutscher 2005: 117ff.). It denotes any case of language use where parts of the conventional meaning of the expressed linguistic form are ignored by the interlocutors because they are not relevant in the given context. The more obviously these dismissed parts of the conventional meaning would conflict with the actually communicated meaning, the more figurative appears the respective instance of language use to be. Therefore, when we talk about metaphorical use, we refer not to any arbitrary degree of deviance from convention but to the underlying cognitive mechanism defining the continuum of “loose talk” (Sperber & Wilson 1995) or “partial sanction” (Langacker 1987) that extends between literalness and poetic metaphor.

Likewise, we speak of individual instances of metaphorical extension and not of the metaphor-complexes (also called “conceptual metaphors”) that e.g. Lakoff & Johnson (1980) focus on. Such extended metaphor-complexes may emerge as the cumulative effect of the repeated creation of individual metaphorical extensions that allude to already established metaphors. This statement also contains a last distinction we want to clarify: that between the ad hoc creation of a metaphor and so-called *dead* metaphors present in a language (Deutscher 2005). When we speak of metaphorical use, we refer to the former, namely the cognitive process by means of which a speaker uses an extant linguistic convention in a novel, metaphorical way in a particular usage event, and not to metaphors that are already established in a language and have themselves become conventional.

The reasons why speakers use extant conventions metaphorically are manifold. They may want to attract attention, establish prestige, avoid committing themselves the way they would if they used a literal expression (Pinker et al. 2008), or a metaphor may simply be shorter than a cumbersome literal circumlocution. A crucial aspect of metaphorical language use, however, is its creative potential: a metaphor may allow a speaker to express a meaning for which no extant convention exists yet. This was obviously not the case for *be going to* — English contained ways of expressing intention already before the grammaticalisation of *be going to*. But this aspect of metaphorical use will play a vital role in the examples discussed later in this article.

Along these lines, example (3) illustrates what we will call the metaphor-based scenario of grammaticalisation. A speaker intends to express INTENTION (3a). She uses the form for SPATIAL MOTION metaphorically, assuming that the hearer will realise that (i) spatial motion is irrelevant in the current context, and (ii) spatial

motion often implies intention, which in turn *is* relevant (3b–f).³ The hearer realises that the literal meaning of the signal is irrelevant in the current context, and falls back on INTENTION, which he associates — and knows the speaker associates — with SPATIAL MOTION (3g–m).

(3) Detail of the metaphor-based scenario.

Speaker:

- (a) I want to express INTENTION.
- (b) I have a construction which expresses SPATIAL MOTION, and the hearer shares this convention.
- (c) SPATIAL MOTION is associated with INTENTION.
- (d) SPATIAL MOTION is not relevant in the given context.
- (e) Because we share common ground, the hearer will be aware of (b)–(d), and realise that I am aware of it too.
- (f) Because of (e), I can use the construction for SPATIAL MOTION metaphorically to convey INTENTION.

[Speaker expresses SPATIAL MOTION]

Hearer:

- (g) The speaker has expressed SPATIAL MOTION.
- (h) SPATIAL MOTION is not relevant in the given context.
- (i) SPATIAL MOTION often implies INTENTION.
- (j) INTENTION would be relevant in the given context.
- (k) I must assume that the speaker is co-operative.
- (l) I must also assume that the speaker is aware that I know (g)–(k), and that I know of his being aware of it.
- (m) From (g)–(l), I conclude that the speaker intends to convey intention.

2.3 Conventionalisation

The scenario described above illustrates how the original linguistic convention associated with *be going to* could have been used in a specific situation to communicate the meaning which *be going to* would later come to stand for. However, such an instance of ostensive-inferential communication is only the first step on the way to grammaticalisation. A second step needs to follow it for the process of grammaticalisation to be complete: the conveyed utterance meaning needs to become a new linguistic convention itself. This additional cognitive process of conventionalisation is initiated when the speaker and the hearer memorise the particular usage of an expression which they have just experienced. In the case described in (3), they may remember that *be going to* was used to convey INTENTION, while at the same time maintaining their knowledge that it conventionally expresses SPATIAL

MOTION. The memorisation of the usage of an expression therefore has two effects: the entrenchment of a new form-meaning association, and the establishment of new common ground between the involved individuals.

The more frequently a particular expression like *be going to* is used to convey the same meaning, the more deeply the association between that form and the meaning will become entrenched in the knowledge of the user. Such entrenchment is a form of automatisisation where an experienced association between a form and a meaning turns into a psychological unit and that unit becomes enforced (Langacker 1987) in the user's encyclopedic knowledge. The more deeply a form-meaning association is entrenched, the more readily it is accessible: if, for instance, the association between *be going to* and INTENTION is sufficiently entrenched, it may be activated without the complex reasoning that was necessary to invoke it when that entrenchment had not yet happened. Through entrenchment, a form-meaning association can thus gain a certain degree of independence from its context of use. The depth of entrenchment is related to frequency of usage, because with each usage event, the association between the used linguistic form and the communicated meaning is further entrenched in both the speaker and the hearer, that is, in all individuals involved in the communicative episode (Croft 2000: 73).

While entrenchment affects each user individually, the memorisation of usages also has a more social component: it adds to the common ground that two individuals share. The awareness that *be going to* has in previous contexts been used successfully to convey INTENTION, and that the hearer shares this knowledge, will allow the speaker to re-use *be going to* in the same sense in later communicative situations with the same hearer even when the context would not allow for the reasoning detailed in (3). Like entrenchment, the establishment of new common ground thus lets an association between a linguistic form and the meaning that form has been used to communicate become more context-independent. Once it has become common ground, an association between a form and a meaning can itself serve as background knowledge on the basis of which novel utterance meanings can be conveyed in future acts of ostensive-inferential communication.

The simple cognitive mechanism of usage memorisation can thus lead to the conventionalisation of a form-meaning association because it results in entrenchment and the establishment of new common ground. Ultimately, conventionalisation describes the phenomenon sometimes referred to as context-absorption (Kuteva 2001: 150f.): an utterance meaning turns into a conventional meaning, that is, a pragmatically inferred meaning becomes the semantically encoded meaning associated with the used expression. The process of context-absorption — or rather its results — has been referred to frequently in both the grammaticalisation

and the historical pragmatics literature (see e.g. Levinson 2000: 262–264; Kuteva 2001: 150f.; Traugott & Dasher 2005: 35).

Note that usage memorisation can bring about a situation of *layering* in an individual's linguistic knowledge, if the employed linguistic form is newly associated with a meaning that is different from its conventional meaning. The memorisation of the usage event described in (3) above, for instance, will lead to the speaker and the hearer entertaining two linguistic conventions involving *be going to*: one that associates it with SPATIAL MOTION and another one that associates it with INTENTION. However, the old and the new convention might exhibit different degrees of entrenchment. If they are both sufficiently entrenched, the impression of polysemy arises, and the expression is conceived as having multiple meanings.

2.4 The reanalysis-based scenario

As above, before we present the reanalysis-based scenario of grammaticalisation, we first explain our conception of reanalysis. Whenever a hearer interprets an utterance, he creates a set of mappings between the form and the meaning which he assumes the speaker intends to convey with her utterance. Such mappings can be of arbitrary complexity, including not only a mapping between the whole form and the whole meaning, but also mappings between individual components of the form and their semantic counterparts, as interpreted in the context of use. Every set of form-meaning mappings is thus an analysis of the way in which the form represents the meaning associated with it. Each independent interpretation of a form therefore yields its own analysis; if two such analyses differ in any way, then we can say that a re-analysis of the relationship between form and meaning has taken place.

Our notion of reanalysis is similar to, but broader than, that proposed by Hopper & Traugott (2003), who suggest that reanalysis occurs whenever “the hearer understands a form to have a structure and a meaning that are different from those of the speaker” (Hopper & Traugott 2003: 50). We concur with this, but note that reanalysis is not just restricted to comparisons between a speaker's analysis and a hearer's analysis; the comparisons can be either diachronic or synchronic, and the analyses themselves can be either by different individuals or by the same individual at different times. This view of reanalysis as a comparison is firmly based in the inference of meaning from context, and encompasses any difference in analysis, whether it be a difference in the meanings associated with the utterance as whole, in whether particular components of the meaning are pragmatically inferred or semantically encoded (Traugott & Dasher 2005: 35), or in how the components of the form are mapped to components of the meaning (Croft 2001: 21), including both sides of the traditional division between morphological and syntactic change (see Trask 2000, Harris & Campbell 1995, Haspelmath 1998 and McDaniels 2003

for different, more restrictive definitions of the kinds of linguistic change which count as reanalysis).

Reanalysis can also be seen as the *process* through which the two different analyses arise, and we agree with Detges & Waltereit (2002)'s argument that this process is an inevitable consequence of the cognitive mechanisms underlying ostensive-inferential communication. The context of a particular situation can be modelled, in principle, to arbitrarily complex levels, and therefore the contexts of any two situations will almost inevitably be different. In this respect, therefore, reanalysis is almost ubiquitous in communicative discourse: every time an utterance is interpreted, there will be some (possibly small) difference between the speaker's context and the hearer's context, which may lead to a mismatch between the meaning the speaker intended to communicate and that which is inferred by the hearer (Kuteva 2001: ch. 6), and thereby to differences in how the connections between components of form and components of meaning are understood.

It is important to note that because the mappings between form and meaning are internal to every linguistic individual, both they, and therefore also reanalysis itself, can never be directly observed. Differences between two sets of mappings can only be uncovered through actualisation (Trask 2000), when utterances are produced which are consistent with only one of the analyses. An actualisation of the analysis of *be going to* as a marker of INTENTION or FUTURITY but not MOTION is shown in example (4): the utterance in 4(a) can be happily interpreted as either INTENTION or MOTION, with no change in the communicative effect, while the utterance in 4(b) cannot be interpreted as MOTION, because this clashes with the meaning of *stay*. This clash forces the interpretation INTENTION as the only one which is communicatively plausible, and this thereby makes clear, or actualises, the analysis which maps *be going to* to INTENTION.

- (4) a. I am going to play football this evening.
- b. I am going to stay here this evening.

Given this notion of reanalysis, therefore, we now set out the details of our reanalysis-based scenario in example (5), in which the speaker uses *be going to* in its conventional sense to express SPATIAL MOTION — the expression of which she deems relevant in the given context (5a–e). The hearer, however, perceives things differently; he does not think that SPATIAL MOTION is relevant in the present situation but *does* believe that information about INTENTION would be (5f–l). From the hearer's perspective, this appears to be exactly the same scenario as the metaphor-based scenario in example (3). This time, the interlocutors make different adjustments to their codes: the speaker will further entrench the convention that maps *be going to* onto SPATIAL MOTION, whereas the hearer establishes a new, additional association between *be going to* and INTENTION.⁴

(5) Detail of the reanalysis-based scenario.⁵

Speaker:

- (a) I want to express SPATIAL MOTION.
- (b) I have a construction for the expression of SPATIAL MOTION in my linguistic code, and the hearer shares this convention.
- (c) SPATIAL MOTION is relevant in the given context.
- (d) Because we share common ground, the hearer will be aware of (b)–(c) and realise that I am aware of it too.
- (e) Because of (d), I can use the construction to communicate SPATIAL MOTION.

[Speaker expresses SPATIAL MOTION]

Hearer:

- (f) The speaker has expressed SPATIAL MOTION.
- (g) SPATIAL MOTION is not relevant in the given context.⁶
- (h) SPATIAL MOTION often implies INTENTION.
- (i) INTENTION would be relevant in the given context.
- (j) I must assume that the speaker is co-operative.
- (k) I must also assume that the speaker is aware that I know (f)–(j), and that I know of his being aware of it.
- (l) From (f)–(k), I conclude that the speaker intends to convey INTENTION.

A special case of the reanalysis-based scenario is one where the hearer, in the role of a language learner, has no existing mapping for *be going to* in his lexicon. However, because he can work out from the context that the speaker intends to express INTENTION, he will create an association between that meaning and *be going to*. In contrast to the previous two scenarios, layering does not arise in the hearer's linguistic knowledge in this case.

2.5 Comparing the two scenarios

We conclude from the analyses presented above that the two scenarios of grammaticalisation, which we have called metaphor- and reanalysis-based respectively, do not invoke different *processes* but merely describe different *circumstances*. In both scenarios, exactly the same cognitive mechanisms are at work: (i) the psychological underpinnings of ostensive-inferential communication, namely the assumption of common ground, including the knowledge of shared linguistic conventions and the recognition of what is relevant in the given context; (ii) the memorisation of usages and their subsequent entrenchment, which can lead to conventionalisation because it also involves the establishment of new common ground between the individuals participating in the communicative act.

Probably the most striking observation that arises from the comparison of the two scenarios as we have analysed them is that the hearer's part is exactly the same in the metaphor-based and in the reanalysis-based account. In both cases, the hearer assumes that the speaker has used *be going to* in a metaphorical sense. What distinguishes the two scenarios in our example is the speaker's reasoning. In the metaphor-based scenario, the speaker intends to express INTENTION and considers it to be common ground that information about SPATIAL MOTION is irrelevant in the current situation. In the reanalysis-based scenario, the speaker intends to express SPATIAL MOTION — which she deems relevant in the given context. However, while in the metaphor-based scenario, speaker and hearer entertain the same assumptions about what constitutes common ground, in the reanalysis-based scenario, the hearer's assumptions on common ground are different from the speaker's. The interlocutors therefore have different beliefs (albeit ever so slightly so) about the content of the interchange, yet communication does not conspicuously fail. This is because the success of a communicative episode is determined not by comparing the inaccessible internal meanings understood by the interlocutors, but by checking whether the resulting perlocutionary effect satisfies the speaker's expectations; as long as the meaning reconstructed by the hearer has the same effect as the meaning which was intended, the difference in assumptions will pass unnoticed. To summarise, common ground is successfully established in the metaphor-based scenario, while a mismatch between the respective discourse contexts of the interlocutors occurs in the reanalysis-based scenario (for the latter, see also Kuteva 2001: ch. 6).

However, this difference between the two scenarios is not caused by different underlying cognitive processes but merely by different circumstances. Both scenarios are based on the interlocutors' capacities to entertain assumptions about what constitutes common ground in a given situation: it is only that their assumptions happen to differ in the reanalysis-based scenario. And even these two cases have to be seen as points on a continuum, namely one that ranges from situations where the interlocutors entertain identical assumptions about their common ground to situations where their assumptions are completely different. These, of course, are hypothetical limiting cases: the former condition is unlikely to occur (Sperber 1996: 101), and the latter would prevent ostensive-inferential communication from being established.

Who, then, is the innovator? In the metaphor-based scenario, both speaker and hearer end up with a novel form-meaning association: the speaker because she has used an extant convention in an innovative way, and the hearer because he has picked up the speaker's innovation. In the reanalysis-based scenario, only the hearer extends his linguistic conventions. The speaker does not use language innovatively but, because of an existing contextual mismatch, the hearer misinterprets her utterance as the innovative use of an extant convention. The two scenarios

have thus merely different foci with respect to the source of innovation: one is speaker-oriented, the other one is hearer-oriented. Each of them can be seen as a special, more constrained case of the other. The reanalysis-based scenario can be interpreted as a speaker-oriented scenario where the speaker and the hearer happen to make different assumptions about what constitutes common ground and the hearer thus interprets the communicative event as innovative, when it was not intended to be. The metaphor-based scenario, on the other hand, can be understood as a hearer-oriented scenario where the interlocutors' assumptions of common ground happen to coincide and both speaker and hearer interpret the usage event they attend to as innovative. We can therefore draw the following conclusions. Language use can be either conventional or innovative — both in production and in comprehension. The scenarios of grammaticalisation we have discussed here merely represent different combinations of conventional and innovative use in the interlocutors: one and the same innovation can occur in the speaker, or in the hearer, or in both interlocutors, or in neither. This finding is summarised in Table 1. In order to complete the picture, we have also included in the table the two conditions which do not contribute to grammaticalisation: when a speaker uses language in its conventional sense and the hearer interprets it likewise (shown in the first row of the table), and when a speaker uses language innovatively but the hearer interprets it as an instance of conventional use (shown in the last row of the table). The latter could, of course, initiate grammaticalisation in the speaker's grammar, but for this innovation to spread, it would later have to occur under one of the other three sets of conditions.

Table 1. The possible combinations of conventional and innovative use.

Speaker's production	Hearer's comprehension	Contextual mismatch	Scenario of grammaticalisation
conventional	conventional	no	NA
innovative	innovative	no	metaphor-based
conventional	innovative	yes	reanalysis-based
innovative	conventional	yes	NA

Table 1 represents a single communicative episode (e_1), of course, and in both our grammaticalisation scenarios the hearer's internalised innovation is not immediately visible in linguistic usage. Imagine a later episode (e_2) in which the hearer from e_1 acts as the speaker and uses the innovation from the first episode; it is only during the second episode that the innovation becomes observable. The usage in the second episode is now a conventional usage from the speaker's viewpoint (who was the hearer in e_1), but innovative to the new hearer, and different from that used by the original speaker from e_1 . We note that this process is equivalent to

the two-stage actualisation of reanalysis, when a new analysis becomes observable through analogy (Hopper & Traugott 2003: 69, 93).

Finally, we consider a condition which combines aspects of both the metaphor-based and the reanalysis-based scenarios: the speaker and hearer are both innovative in their usage, yet there is also a contextual mismatch, because they make *different* innovations, and thus different adjustments to their internal linguistic representations. In (6), the speaker intends to express INTENTION, and so uses the form for SPATIAL MOTION metaphorically, assuming that the hearer will realise that spatial motion is irrelevant, but that it often implies intention, which is relevant (6a–f). The hearer recognises that SPATIAL MOTION is irrelevant, but assumes that the form is being used metaphorically to express FUTURITY, not INTENTION. This scenario clearly illustrates the fundamentally approximate and uncertain nature of ostensive-inferential communication (Hurford 2007: 21); neither interlocutor ever knows the exact details of the other's knowledge, but must form, and act upon, assumptions made on the basis of their shared experiences.

- (6) Detail of a scenario combining both metaphor-based and reanalysis-based aspects.

Speaker:

- (a) I want to express INTENTION.
- (b) I have a construction which expresses SPATIAL MOTION, and the hearer shares this convention.
- (c) SPATIAL MOTION is associated with INTENTION.
- (d) SPATIAL MOTION is not relevant in the given context.
- (e) Because we share common ground, the hearer will be aware of (b)–(d), and realise that I am aware of it too.
- (f) Because of (e), I can use the construction for SPATIAL MOTION metaphorically to convey INTENTION.

[Speaker expresses SPATIAL MOTION]

Hearer:

- (g) The speaker has expressed SPATIAL MOTION.
- (h) SPATIAL MOTION is not relevant in the given context.
- (i) SPATIAL MOTION often implies FUTURITY.
- (j) FUTURITY would be relevant in the given context.
- (k) I must assume that the speaker is co-operative.
- (l) I must also assume that the speaker is aware that I know (g)–(k), and that I know of his being aware of it.
- (m) From (g)–(l), I conclude that the speaker intends to convey FUTURITY.

2.6 Multi-step scenarios

So far, we have done two things: we have sketched *possible* metaphor- and reanalysis-based pathways for the grammaticalisation of *be going to*, and we have shown that in both cases, the same cognitive mechanisms are at work. The two scenarios we have discussed illustrate under what circumstances SPATIAL MOTION could have come to express INTENTION in one step. Note that we are not claiming that motion verbs must *unavoidably* change into intention verbs, but rather that the specifics of the context is important as to the future development of a construction (see also Heine 2002; Diwald 2002).

We show now that the same development can also have happened in more than one step, with still exactly the same set of cognitive mechanisms underlying. In fact, historical evidence suggests that this was indeed the case for the specific example of the English expression *be going to*. We must assume that the development from SPATIAL MOTION to INTENTION included an intermediary stage where *be going to* had come to be associated with intentional (or purposive) spatial motion, thus having assumed the notion of INTENTION while at the same time retaining its aspect of SPATIAL MOTION. Kuteva (2001: 117–121), referring to Perez (1990), points out that this development was facilitated by the intrinsically purposive nature of human spatial motion. Consequently, as Bybee et al. (1994) have shown, *be going to* (in imperfective aspect) lent itself to being complemented with a purposive clause, which solidified the conventionalisation of the aspect of INTENTION together with the original meaning SPATIAL MOTION.

In examples (7–10), we demonstrate that the individual stages of the historically attested grammaticalisation chain of *be going to* can be analysed as being initiated by exactly the same set of cognitive mechanisms that we have identified above. The stages correspond to those outlined by Kuteva (2001: 117–121). The first step, detailed in example (7), describes the addition of the aspect of INTENTION to SPATIAL MOTION.⁷ The second step, detailed in example (8), illustrates the further addition of PREDICTION (FUTURITY). Both these developments describe a process of increasing semantic narrowing (SPATIAL MOTION > SPATIAL MOTION & INTENTION > SPATIAL MOTION & INTENTION & PREDICTION).

(7) Detail of step I of a multi-step scenario.

Speaker: *Henry is going to town.*

Hearer:

- (a) The speaker has expressed SPATIAL MOTION.
- (b) SPATIAL MOTION *alone* is not relevant in the given context.
- (c) SPATIAL MOTION often implies INTENTION.

- (d) SPATIAL MOTION together with INTENTION would be relevant in the given context.
 - (e) I must assume that the speaker is co-operative.
 - (f) I must also assume that the speaker is aware that I know (a)–(e), and that I know of his being aware of it.
 - (g) From (a)–(f), I conclude that the speaker intends to convey SPATIAL MOTION and INTENTION.
- (8) Detail of step II of a multi-step scenario.
Speaker: *I am going to win.*
- Hearer:
- (a) The speaker has expressed SPATIAL MOTION and INTENTION.
 - (b) SPATIAL MOTION and INTENTION *alone* is not relevant in the given context.
 - (c) INTENTION often amounts to PREDICTION.
 - (d) SPATIAL MOTION and INTENTION together with PREDICTION would be relevant in the given context.
 - (e) I must assume that the speaker is co-operative.
 - (f) I must also assume that the speaker is aware that I know (a)–(e), and that I know of his being aware of it.
 - (g) From (a)–(f), I conclude that the speaker intends to convey SPATIAL MOTION, INTENTION and PREDICTION.

In a third and fourth step, we can observe the type of semantic broadening or bleaching that is often described as characteristic of grammaticalisation. Example (9) details a situation that initiates the use of *be going to* without the aspect of SPATIAL MOTION, and example (10) details one in which *be going to* is subsequently used without the aspect of INTENTION. The conventionalisation of the latter leads to the conventional usage of *be going to* to express (predictive) future tense. This second part of the grammaticalisation chain thus includes the following steps of semantic broadening: SPATIAL MOTION & INTENTION & PREDICTION > INTENTION & PREDICTION > PREDICTION.

- (9) Detail of step III of a multi-step scenario.
Speaker: *I am going to do my best to make you happy.*
- Hearer:
- (a) The speaker has expressed SPATIAL MOTION, INTENTION and PREDICTION.
 - (b) SPATIAL MOTION is not relevant in the given context.
 - (c) INTENTION and PREDICTION would be relevant in the given context.
 - (d) I must assume that the speaker is co-operative.

- (e) I must also assume that the speaker is aware that I know (a)–(d), and that I know of his being aware of it.
 - (f) From (a)–(e), I conclude that the speaker intends to convey INTENTION and PREDICTION only.
- (10) Detail of step IV of a multi-step scenario.
- Speaker: *The rain is going to come.*
- Hearer:
- (a) The speaker has expressed INTENTION and PREDICTION.
 - (b) INTENTION is not relevant in the given context.
 - (c) PREDICTION would be relevant in the given context.
 - (d) I must assume that the speaker is co-operative.
 - (e) I must also assume that the speaker is aware that I know (a)–(d), and that I know of his being aware of it.
 - (f) From (a)–(e), I conclude that the speaker intends to convey PREDICTION only.

The scenarios introduced in (3) and (5) above, which did not consider the aspect of PREDICTION, deliberately conflated the two steps of semantic narrowing and semantic broadening into one step of semantic shift (MOTION > INTENTION), whereas the scenarios here illustrate a multi-step pathway that corresponds more closely to what we know about the specific example of *be going to* from historical evidence.

The crucial point for us, however, is this. With regard to the underlying cognitive mechanisms that we need to assume, not only does it not matter whether we adopt a metaphor-based or a reanalysis-based scenario, but it is also irrelevant how many intermediate stages we postulate: in all cases it is *exactly the same set of cognitive mechanisms* which are at work, with only the specifics of the circumstances in which a certain change is assumed to have been initiated being different.

3. The pre-linguistic basis

We now turn to the question of how our unified analysis of the process of grammaticalisation relates to the origin of language. We claim that early human pre-linguistic communication must have exhibited the same structure as the linguistic scenarios we have described. In the following paragraphs, we discuss a typical approach to language evolution in light of the above analysis of the mechanisms involved in ostensive-inferential communication. The crucial point here is to notice that ostensive-inferential communication does not need to be linguistic. Even in present-day human communication, non-linguistic ostensive-inferential communication is frequently applied where language is not available, not suitable, or

not needed because there is sufficient common ground between the interlocutors (LaPolla 2006). Non-linguistic cues can be sounds, gestures or other types of behaviour that will be interpreted by an observer as communicative because they would not otherwise be plausible or relevant in a given context.

3.1 Burling's scenario revisited

One of the main questions that evolutionary linguistics has to address is how certain forms of behaviour become associated with meanings in the first place. Burling (2000, 2005) makes a case for a scenario that emphasises the role of comprehension in this process. He suggests that form-meaning associations arise when an individual erroneously interprets a conspecific's behaviour as communicative. Burling concludes that comprehension runs ahead of production in the evolution of language: "communication does not begin when someone makes a sign, but when someone interprets another's behaviour as a sign" (Burling 2000:30). Burling's scenario is compatible with our approach — it effectively constitutes an extreme case of reanalysis — but for the following reasons, we do not find his conclusion warranted.

The central question is to identify the reasoning which Burling's scenario demands on the part of the individual who mistakenly interprets another individual's behaviour as a meaningful signal. To investigate this, we provide below the details of the comprehension process of a possible instantiation of Burling's scenario. In the interaction illustrated in example (11), one individual growls, and another individual erroneously interprets this as a warning about the presence of a lion.

- (11) Burling's reanalysis-like scenario for the origin of a pre-linguistic communicative convention.

[Individual A expresses GROWLING.]

Individual B:

- (a) Individual A has expressed GROWLING.
- (b) GROWLING itself is not relevant in the given context.
- (c) GROWLING often implies LION.
- (d) LION would be relevant in the given context.
- (e) I must assume that individual A is co-operative.
- (f) I must also assume that individual A is aware that I know (a)–(e), and that I know of his being aware of it.
- (g) From (a)–(f), I conclude that individual A intends to convey LION.

In order to interpret the first individual's behaviour as a communicative cue, the second individual needs the set of assumptions detailed in (11a–f). These assumptions are equivalent to the hearer's reasoning in the two scenarios for

grammaticalisation sketched above. We have explained above that such reasoning involves the capacity to recognise common ground (even though, as in the shown case, the respective assumptions may be misguided) and, specifically, a recognition of what information would be relevant in the given situation. Both capacities are based on the ability to interpret the intentions of other individuals.

But these cognitive capacities are at the same time sufficient for an individual to be capable of not only comprehending but also producing an ostensive cue. It thus seems hardly plausible to assume a state where individuals were capable of comprehension but not of production, since both activities require the same minimal cognitive endowment. On the contrary, although Burling's reanalysis-like scenario is of course possible, given the mechanisms of ostensive-inferential communication and the possibility for a contextual mismatch despite the assumption of common ground, the corresponding metaphor-like scenario must be considered equally likely. In example (12), we have detailed an example of what such a scenario would look like in this case. In contrast to Burling's assumptions, our analysis suggests that the capacities to produce and comprehend ostensive cues do not emerge at different moments in human evolution. They are rather both based on the same set of more basic cognitive abilities, and once these are in place, both production and comprehension are available to an individual.

- (12) Detail of a metaphor-like scenario for the origin of a pre-linguistic communicative convention.

Individual A:

- (a) I want to express LION.
- (b) I can express GROWLING.
- (c) GROWLING is associated with LION.
- (d) GROWLING is not relevant in the given context.
- (e) Because we share common ground, individual B will be aware of (b)–(d), and realise that I am aware of it too.
- (f) Because of (e), I can use GROWLING (quasi “metaphorically”) to convey LION.

[Individual A expresses GROWLING.]

Individual B:

- (g) Individual A has expressed GROWLING.
- (h) GROWLING is not relevant in the given context.
- (i) GROWLING often implies LION.
- (j) LION would be relevant in the given context.
- (k) I must assume that the speaker is co-operative.

- (l) I must also assume that individual A is aware that I know (g)–(k), and that I know of his being aware of it.
- (m) From (g)–(l), I conclude that individual A intends to convey LION.

3.2 Semantic Reconstruction

To complete the parallel with the linguistic analysis above, we present a scenario containing aspects of both metaphor-like and reanalysis-like scenarios, in which both interlocutors are innovative, but they make different innovations. In example (13), one individual growls in order to warn another of the presence of a lion (13a–f), but the latter erroneously interprets it as a warning about a jackal (13g–m). Both interpretations may have the same perlocutionary effect (for instance, that both individuals climb into the trees to escape), and so the mismatch in understanding remains unnoticed.

- (13) Detail of a pre-linguistic scenario that combines both metaphor-like and reanalysis-like aspects.

Individual A:

- (a) I want to express LION.
- (b) I can express GROWLING.
- (c) GROWLING is associated with LION and with JACKAL.
- (d) GROWLING and JACKAL are not relevant in the given context.
- (e) Because we share common ground, individual B will be aware of (b)–(d), and realise that I am aware of it too.
- (f) Because of (e), I can use GROWLING (quasi “metaphorically”) to convey LION.

[Individual A expresses GROWLING.]

Individual B:

- (g) Individual A has expressed GROWLING.
- (h) GROWLING is not relevant in the given context.
- (i) GROWLING often implies LION or JACKAL.
- (j) JACKAL would be relevant in the given context, LION not.
- (k) I must assume that individual A is co-operative.
- (l) I must also assume that individual A is aware that I know (g)–(k), and that I know of his being aware of it.
- (m) From (g)–(l), I conclude that individual A intends to convey JACKAL.

In all versions of Burling’s scenario, the observed form and the inferred meaning are associated, memorised and subsequently conventionalised in the individuals’ encyclopaedic knowledge bases. In the scenarios characterised by mismatches in

the individuals' assumptions, however, these developing conventions also differ: in (11) only the "hearer" in fact memorises the usage and assumes that it is common ground, while in (13) both individuals memorise different usages. Because these new associations have been made by no-one else, an individual can only re-use them successfully in future situations if the context provides enough clues for the meaning to be reconstructed. The inferential reconstruction of meaning is the mechanism through which form-meaning mappings persist and survive over time; those mappings whose meanings can be easily and repeatedly reconstructed will be preferentially replicated, while those which are difficult to reconstruct will quickly perish (Smith 2008).

From the analyses presented in this section, we can see that the same general cognitive reasoning processes underpin all ostensive-inferential communication, both linguistic and pre-linguistic. These same mechanisms, which we have shown to be fundamental to the process of grammaticalisation in modern languages, could therefore also have been behind the emergence of communicative conventions, both linguistic and pre-linguistic.

There remains, of course, a big gap to be bridged between the discussed pre-linguistic forms of communication and the emergence of grammatical material in human language. Even though it is not the aim of this article to account for how this "problem of linkage," as Kirby (1999:20) refers to this type of evolutionary puzzle, can be solved, we make a contribution toward a solution nonetheless by identifying the continual element in both the state before and the state after the transition to language. We agree with Tomasello's (2003) description of human language as the product of cumulative cultural evolution. According to this account, the human capacity to recognise common ground and in particular to understand conspecifics as intentional beings has given rise to symbolism, and once symbolic conventions were available, grammar emerged gradually as the cumulative result of grammaticalisation and syntacticisation processes as they have been described by Givón (1979), Hopper (1987) and many others since. What this article adds to Tomasello's scenario is the recognition that the emergence of pre-linguistic symbolic conventions and the process of grammaticalisation are in fact not distinct phenomena but rather constitute instances of one and the same set of cognitive mechanisms. This analysis suggests that human language has emerged from pre-linguistic communication through iterated acts of ostensive-inferential communication, which, in the course of cumulative cultural evolution, have given rise to both symbolic conventions as well as grammatical material. Our account has the advantage that it upholds the principle of uniformity of process, which is particularly important in the light of the absence of any directly observable data on language evolution: it analyses the cognitive process underlying documented

cases of grammaticalisation and projects them back to explain the emergence of symbolic conventions.

4. Conclusion

In this paper we have examined the metaphor-based and reanalysis-based approaches to grammaticalisation in detail, and have provided a unified account based not on their linguistic properties but on the cognitive mechanisms underlying ostensive-inferential communication, such as the assumption of common ground between interlocutors, and the memorisation of communicative experiences. Moreover, we have shown that these mechanisms are not specific to language, but are instead instances of much more fundamental, domain-general cognitive properties. Having characterised grammaticalisation in terms of domain-general mechanisms which are more basic and ancient than language, we then explored the emergence of pre-linguistic conventions using the same framework, and concluded that the same cognitive processes were also at work in this case. We therefore claim that acknowledging the cognitive mechanisms underlying ostensive-inferential communication will not only allow us to shed new light on the linguistic study of grammaticalisation, but will also provide the foundation for a unified explanation of historical language change and the origin and evolution of language.

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Notes

1. Sperber & Wilson (1995) refer to this as a mutual cognitive environment.
2. An example of a basic ostensive act would be pointing at an object in order to orientate the hearer's attention to it. Diessel (1999) argues that words used exophorically, accompanying such acts, develop into demonstratives through grammaticalisation.
3. Of course, this implication is one of many which could be used; whether or not it is used depends on what is relevant in the current context.
4. Note that the emerging asymmetry in the interlocutors' codes can easily go unnoticed and does not necessarily lead to miscommunication. Evans & Wilkins (2000:549f.), for instance,

point out that semantic change typically occurs in what they call “bridging contexts,” where “speech participants do not detect any problem of different assignments of meaning to the forms because both speaker and addressee interpretations of the utterance in context are functionally equivalent, even if the relative contributions of lexical content and pragmatic enrichment differ” (Evans & Wilkins 2000: 550).

5. See Kuteva (2001: ch. 5–6) for a similar description of the reanalysis-based scenario.
6. Again, this analysis is somewhat simplified, as relevance is a continuum, not a binary-valued function. It might be more accurate to state that SPATIAL MOTION is not the most relevant interpretation possible in the given context.
7. We only explicate the hearer’s reasoning here, which is the same in both the metaphor-based and the reanalysis-based scenario. It is understood that, depending on which scenario one assumes for each individual step, the speaker’s reasoning amounts to innovative or conventional use respectively.

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