Grammaticalization as analogically driven change?

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> One of the ubiquitous principles of the psycholinguistic system is its sensitivity to similarity. It can be found in the domains of perception and production (as well as learning).
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> The more similar any two sets are, the more likely the wrong rule is applied.
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> (Berg 1998: 185; 236)

1. Introduction

Since the 1980s, grammaticalization has been a popular research topic in diachronic linguistics, with its field of application widening considerably over time so that the phenomenon of grammaticalization came to be elevated to theoretical status: a model to understand how language is used and structured, and develops through time. Its spreading popularity has also led to increasing concern about quite a number of aspects related to the model. Some of the more important questions raised are:

(i)   Is grammaticalization an independent mechanism or an epiphenomenon (i.e. a conglomerate of changes occurring elsewhere that happen to coincide in cases of grammaticalization)?

(ii) What is the relation between the synchronic speaker-listener and the essentially diachronic nature of grammaticalization? What role is played by the synchronic system that the grammaticalizing structure is part of?

(iii) What empirical evidence do we have for grammaticalization, and, perhaps more importantly, where should we look for evidence?

(iv) What causes grammaticalization and language change in general? Should the mechanisms that apply in language learning also apply in language change?
      And more particularly, what is the role of analogy, reanalysis, frequency, to mention some of the more important factors, in this context?[1]

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[1] Language contact is also relevant here, but since this is an external rather than an internal factor it will be largely ignored.

These questions will be addressed in section 2, where I will also highlight the position of analogy. In section 3, I will explore the nature of analogy further in order to find out in how far grammaticalization can be understood as an instance of analogically driven change.

2. The nature of grammaticalization

In order to know what grammaticalization is we have to determine what its characteristics are. Problematic here is that the process covers quite a number of phenomena, and different ones for different linguists. Its core for most linguists, roughly following Meillet's (1912: 131) early definition, involves the development of a particular lexeme (or a combination of lexemes as part of a construction) into a grammatical function word, on a 'cline' from lexical to grammatical, where the development could also pertain to any subpart of this cline. Gradually, however, grammaticalization began to include the development of grammatical constructions in general, without the kernel of substantive elements, so that general word-order restrictions or the creation of new syntactic patterns also became part of it; witness e.g. Givón's (1979) statement that syntax develops out of discourse, as well as his treatment of clause-combining (see also Hopper/Traugott 2003: 194; 209-11; Bybee 2003). Other clines having to do with subjectification (where the cline moves from propositional via textual to more epistemic stances) were likewise seen to fall under grammaticalization (cf. Traugott 1982, 1989, 1995).

This widening led to a weakening of the power of grammaticalization as a clearly circumscribed mechanism in change. This can easily be seen from the fact that the parameters originally set up by Lehmann (1982: 306) to characterize the canonical type no longer all neatly have to apply in each case.[2] Lehmann's parameters give the process a unity in that they all involve reduction or loss on both the paradigmatic and the syntagmatic plane, i.e. loss of weight (phonetic attrition, semantic bleaching and scope decrease), loss of choice (paradigms of possibilities become reduced and elements become bonded together), and loss of freedom (elements become obligatory in the clause and fixed in position). Obviously, the development of fixed word order or new syntactic patterns doesn't involve phonetic attrition (unless one thinks

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[2] It is therefore perhaps not surprising that Lehmann (2004: 155), firmly sticking to his parameters, does not consider the "creat[ion of] new grammatical structure" an instance of grammaticalization. Bybee (2003: 146), although taking a much wider view of grammaticalization (it includes "the creation of word order patterns"), interestingly enough, virtually follows Lehmann's parameters when she discusses the cognitive processes involved in grammaticalization.

of this as whole elements being elided; but note that this would disrupt the widely accepted notion of grammaticalization being gradual) or bleaching. Furthermore, it has been suggested that in many cases, especially those involving subjectification, there is scope *in*crease rather than *de*crease.[3] Similarly, in the case of clause-fusion or syntacticization discussed by Givón (1979: 214) – he suggests that complement clauses with non-finite verb forms and PRO subjects may have developed from paratactic clauses with finite verbs and lexical subjects – there is no question of Lehmann's parameter 'increase in paradigmaticity' applying since such constructions usually remain in use side by side.

The widening of the field of application and the consequent weakening of the parameters would not be a matter of concern if grammaticalization is considered merely a heuristic device, enabling us to spot the process at work – with only half the parameters being present one could still discover this. However, for many grammaticalizationists it is more than that, it is a unified, unidirectional development that guides, and hence explains, change; it cannot be cut up into pieces, and indeed unidirectionality was and still is one of its main principles (cf. e.g. Bybee 2003: 145; Lehmann 2004: 154; Kiparsky forthcoming). For these linguists, cases of degrammaticalization were thought not to exist or were explained away because they did not square with the notion of unidirectionality, while the (opposite) process of lexicalization came to be seen as a different, orthogonal phenomenon even though the processes working in both grammaticalization and lexicalization are in fact very similar (cf. Himmelmann 2004, Fischer 2007 pace Lehmann 2004: 168-70, Brinton/Traugott 2005).[4]

Linguists, with formal, functional, as well as more philological backgrounds, who combined their voices in the critical volume of *Language Sciences* 23 (cf. also Janda/Joseph 2003, Joseph 2004), stress the fact that all the changes occurring in grammaticalization may also occur independently, thereby querying the nature of the unity of Lehmann's parameters from

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3 Tabor/Traugott (1998) and Roberts/Roussou (2003) even see scope *in*crease as the rule in grammaticalization, referring to the development of modals from full verbs into auxiliaries and from deontic into epistemic modals, and the rise of pragmatic markers (for counterarguments, see Fischer 2007).

Increase should be the rule in cases of degrammaticalization, as can indeed be seen in the development of the infinitival marker to in English, in contrast to German *zu* and Dutch *te* where scope decrease has occurred (cf. Fischer 1997 pace Haspelmath 1989 and Bybee 2003, who consider this case a normal case of grammaticalization in all three languages).

4 This difference is constituted not by the process but by the lexical source input. Only very general items of a basic nature grammaticalize (cf. Bybee 2003: 151).

another direction. These linguists generally stress that more attention should be paid to the speaker-listener, and the synchronic language system used to produce or interpret language utterances. This is not to say that in grammaticalization theory no attention is paid to the speaker-listener level but this is mainly confined to the immediate pragmatic-semantic context, while the shape of the (formal) system also guiding the speaker-listener is ignored (cf. Mithun 1991, Fischer 2007). In general, supporters of grammaticalization see the process as being driven by pragmatic-semantic forces only, a "product of conceptual manipulation" with changes in form *resulting* from this (Heine et al. 1991: 150;174; and cf. Hopper 1991: 19; Rubba 1994; Hopper/Traugott 2003: 75-6). In other words, they would not admit the possibility of form also driving a change.

Looking at grammaticalization from a purely synchronic, speaker-listener point of view rather than a diachronic one may shed a different light on the process or mechanism called 'grammaticalization'. Even though diachrony is present in synchrony in the form of variation, it is not the case that a 'pure' synchronic system does not exist, as Lehmann (2004: 153) maintains. For the speaker-listener, there *is* only the synchronic system at any moment of speech.[5] The point is that the speaker-listener has no panchronic sense, he doesn't necessarily see the connections between the grammaticalization variants in a *historical* light.[6] In other words, in order to prove the existence of grammaticalization as an *actual* mechanism of change linked to human processing, one cannot fall back on the historical process itself. However, this is what is typically done in grammaticalization studies. These attempt to empirically prove the 'reality' of grammaticalization as a mechanism by showing its universal pathway (cf. Haspelmath 1989, 1998,[7] Heine 1994,

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[5] This does not mean that the synchronic system cannot change in a speaker's lifetime; it does constantly, i.e. change is not confined to the period of acquisition only. The point is that in actual speech situations the speaker uses a stable synchronic system.

[6] It is interesting to note in this connection, that even generative linguists have been guilty of panchronism, cf. the synchronic phonological 'rules' suggested by Chomsky/Halle (1968) to derive the stem-vowels in such items as divine/divinity from the same underlying phoneme [i:], neatly following the actual historical development of these vowels from earlier [i:]. From the processing point of view, it seems rather more likely that such words are learned holistically rather than rule-based. Recent studies on the workings of the mind/brain emphasize that retrieval from memory is the preferred strategy, and that people are able to store vast numbers of prefabricated units (cf. Pulvermüller 2002: 193, Dąbrowska 2004: 27).

[7] Haspelmath (1999) still considers grammaticalization unidirectional. However, he no longer sees it as an independent mechanism but a side effect of the maxim of extravagance.

Bybee 2003): the "diachronic identity" or "continuity of two forms or constructions F_1 and F_2, at T(ime)$_1$ and T_2" (Lehmann 2004: 156ff.).[8]

Now this may constitute empirical evidence if one looks at change on the *language output* level: the diachronic stages may be seen as connected, with the constructions at each stage changing gradually, almost imperceptibly, by pragmatic inferencing, analogical extension and reanalysis. However, this scenario need not have any reality at the *processing* level, where the same constructions need not be connected at all. The following question should be raised: is there an actual reanalysis in psycho-/neurolinguistic terms? This point is important considering the fact that it is ultimately the speaker-listener who causes the change.[9]

The 'grammaticalization' of constructions, or the way (diachronically connected) forms are stored in our brains could be said to resemble the process of conversion, and their storage. When a noun like *table* is used as a verb, the two items are stored in different paradigms or categories, both formally and semantically, and, once there, they may drift further apart. There is no question of reanalysis here for the speaker-listener; he is simply making use of the (abstract) grammar system of English that allows such an option (and with increasingly greater ease after most inflexions were lost in the Middle English period). Since there are many such hybrid items in the language, he analogizes, on the basis of an existing pattern, that *table* belongs to this pattern too. How is he to know that *table* had not been used as a verb before, when this verb=noun scheme is such a common pattern in his language?

In a similar way, with the construction *going-to*+infinitive, a present-day speaker-listener identifies it in any actual speech situation as either a full lexical verb followed by a purposive *to*-infinitive, or an auxiliary (with *to* incorporated) followed by a bare infinitive, according to the patterns of the full verb and the auxiliary paradigms that he has mastered in the course of language acquisition. As with conversion, the speaker-listener doesn't reanalyse, he categorizes holistically, whereby he may apply the 'wrong' rule.

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[8] Berg (1998: 51) writes: "reference to a historical development is insufficient as an explanation of a given fact. It should always be asked why a certain development follows one path rather than another and why it took place at all."

[9] Analogy works in the same way as the perception of prototypes, i.e. only a certain amount of similarity is necessary for an item to be seen as belonging to a particular (structural) type. In this sense a structure or word may "snap into place" as if it were a prototypical member of an existing category (Denison 2006: 281). My hypothesis, pace Denison, is that "snapping into place" is more likely to occur in processing "than gradience": the creation of a new (intermediate/gradient) constructional category.

How he categorizes in each case depends on the present state of his grammar as well as the context, just as he can recognize whether *table* is a noun or a verb from the (syntagmatic) context and the paradigmatic inventory of patterns present in his grammar. The context is characterized by formal (i.e. position, word order, the presence of a determiner, inflections etc.) as well as semantic-pragmatic information. The very first time a historical speaker-listener identified *going-to* as auxiliary, therefore, did not constitute an actual reanalysis of *going*(full verb)+*to*-infinitive but a category mistake, a mistake that he could make because the *going-to* form fitted both the V-*to*-V as well as the Aux-V pattern.[10]

Analogical extension is similar, too, in terms of speaker-listener processing: like grammaticalization and conversion it is also based on pattern recognition and categorization. When a speaker uses *brung* rather than *brought*, or *shaked* rather than *shook*, there is no question of reanalysis. He uses past-tense *brung*, because it fits another past-tense pattern: *rung*, *stung* etc., which happens to be far more frequent than the pattern of *brought*.[11] The important point about analogical extension is that it occurs proportionally. It doesn't simply involve the "expansion of contexts in which a construction can occur", "adding new peripheral members [e.g. new infinitives, inanimate subjects] to a category [e.g. *going-to*]" (Bybee 2003: 158); it happens because, once *going-to* is interpreted as belonging to the Aux-category, it will follow the behaviour of other members of this new category.

In all three cases, we can thus provide a historical explanation for the new forms. However, although a certain overall continuity or development

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10 The idea of a 'mistake' is an important point that Deacon (1997: 74) makes with respect to the recognition of iconicity (or analogy):

> *Usually, people explain icons in terms of some respect or other in which two things are alike. But the resemblance doesn't produce the iconicity. Only* after *we recognize an iconic relationship can we say exactly what we saw in common, and sometimes not even then. The interpretive step that establishes an iconic relationship is essentially prior to this, and it is something negative, something that we don't do. It is so to speak, the act of* not *making a distinction.*

The analogy between *going to* and the Aux-paradigm is due to partial (but enough) similarity in meaning (sense of future/possibility) as well as position (adjacent to the infinitive). Note that the formal similarity involves an abstract pattern, not a similarity in lexical or phonetic (surface) form. It is interesting to note that *gonna* also follows the Aux-paradigm in that only adverbs like *soon, always, often* can be placed between *gonna* and the infinitive, which is not possible after fully lexical *going to*.

11 There are other past forms with the same phonetic shape as *brought*, i.e. *fought, caught, sought*, but pattern recognition (and hence a categorization 'mistake') here is not to be expected because it is not supported, as in the case of the *rung*-group, by homogeneous shapes in the present tense, i.e. all the *rung*-members have present tense -*ing* forms.

(unidirectionality) may be ascertained – especially with surface forms connected by 'grammaticalization', and, on a more abstract level, with strong verbs becoming weak (rather than vice versa[12]) – such unidirectionality need not be the case, as we can see in the case of *brung*. In terms of synchronic processing, the choice is not guided by any historical development but by the strength of the patterns that the form can be seen to belong to, and this strength depends in turn on the frequency of the patterns themselves. If one of the variant forms is more of a grammatical function word (as with *going-to*) or a more basic vocabulary item, then that variant will be more frequent, and may become the norm, often followed by the loss of the older form if there is not enough distinction in meaning to preserve both. It could also be said that this type of processing is in fact no different from our ability to fill a sentence pattern like SVO with different lexical elements chosen from the NP and VP categories. That too is a choice, not a reanalysis each time of the SVO pattern.

If we follow this line of argument and try to understand what grammaticalization entails from the synchronic speaker-listener aspect, then it is not necessarily the case that the 'cline' (which has reality only on the level of the historical development of language-output data) has to continue inexorably in the same unidirectional way. Quite possibly, it may, and it often does (due to the fact that the more grammatical variants also happen to become more frequent over time), but it does not always, as shown by attested cases of degrammaticalization, or in cases where weak verbs become strong. Sometimes also processes stop halfway, and similar processes with the same starting point may develop differently in different languages as has happened, for instance, with the modals and the infinitival marker (cf. footnote 3) in Germanic languages.

What may stop a process or what may cause degrammaticalization? It could be a drop in frequency of the item or construction concerned, for whatever reason. But in cases of degrammaticalization, it may be a change elsewhere in the system, which affects the pattern that the grammatical element belongs to. If indeed an important driving force in the grammaticalization of a particular construction is the availability of a grammatical category or pattern that it could fit into, then in a similar way, but with the opposite effect, the non-availability of a pattern may drive

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[12] In this case there is no item-based continuity as with *going-to* since there can be no gradual change from *brought* to *brung*, only an instantaneous one, the reason being that the choices for *going-to* arose syntagmatically, while those for *brung/brought* arose paradigmatically. In both cases, however, the possibility for the choice lies in the analogy, mistaking one pattern for another. Conversion is like brung/brought in this respect, but here there is no unidirectionality at all.

*de*grammaticalization. Plank (1995) has shown that, in the case of the English genitive inflection becoming a clitic, this follows from the fact that the inflectional system of nouns had been eroded so that the genitive ending had become isolated, no longer fitting the new, inflectionless, noun-pattern. A similar situation existed in the case of the Irish 1st plural verb ending *-mid*, which had become the only inflected pro-form in the plural. The fact that *-mid* was upgraded to an independent pronoun, *muid*, is not surprising considering that the pronoun pattern was available in the rest of the verbal paradigm (cf. Kiparsky forthcoming: 28). In such cases, as Plank makes clear, there is a 'Systemstörung', which asks for drastic methods on the part of the speaker-listener to keep the language system manageable.

The hypothesis then is that in both grammaticalization and degrammaticalization (and in conversion too) the driving force, next to (syntagmatic) context and frequency, is the availability of a fitting – in terms of formal and semantic similarity – (paradigmatic) category or pattern for the new variant in the synchronic system of the speaker-listener. If this is correct, analogical thinking plays a role in all the above cases. Analogy only happens on the basis of an exemplar, which may be a concrete lexical form or a more abstract morphosyntactic pattern.

Kiparsky (forthcoming: 6) agrees that both degrammaticalization and grammaticalization are forms of analogical change, which he calls 'grammar optimization'. At the same time, however, he makes a distinction between the two: degrammaticalization is based on exemplar-based analogy, while grammaticalization is a different matter because it is non-exemplar-based. The analogy in the latter case follows "constraints, patterns and categories … provided by UG" (ibid: 6), and only arises "under a reduced input" (ibid: 11). In this way, Kiparsky can preserve Meillet's idea that only grammaticalization can create *new* categories, and he can also save the principle of unidirectionality because degrammaticalization is now seen as different in nature and is therefore no longer the opposite of grammaticalization.

There are a number of problems with Kiparsky's proposal. First of all, it is almost too clever: grammaticalization and degrammaticalization are said to be the same because they are based on analogy, but are different as far as unidirectionality is concerned.[13] Secondly, it relies on the idea of an innate grammar – of which we do not know the contours – so that the notion of non-

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[13] Kiparsky (forthcoming: 6) stresses this problem himself when he writes: "From the traditional point of view, the idea of non-exemplar-based analogy is a contradiction in terms: analogy by definition has a model, a pre-existing pattern of the language which is generalized to new instances".

exemplar-based analogy is not falsifiable, and indeed not explanatory outside its own linguistic model (cf. Fischer 2007: 67-74, and references there). Thirdly, the idea of non-exemplar-based analogy creating new categories is difficult to distinguish from reanalysis, which is seen by many as primary in grammaticalization (cf. Harris/Campbell 1995; Hopper/Traugott 2003: 39, 63-9; Roberts/Roussou 2003). Since Kiparsky's facilitator for grammaticalization is not based on an existing pattern, but on an innate one, it would have to be called 'reanalysis' by anyone whose model doesn't include UG. Thus, Kiparsky is only able to downgrade or "go beyond" (ibid: 19) reanalysis, by putting up empirically invisible UG patterns to base his analogy on. He rejects reanalysis because it doesn't provide an explanation: "labelling a change as a reanalysis, innovative or otherwise, doesn't get at its nature or motivation. For now the claim that grammaticalization is reanalysis remains virtually a tautology" (ibid: 19). In other words, he does not reject reanalysis because it has no reality from the point of view of speaker-listener processing, as I have done above. Fourthly, we end up with two types of analogy, even though ultimately they are both said to fall under grammar optimization (ibid: 6). This, however, is also a problem because it is well-known that exemplar-based analogy is often very local (cf. McMahon 1994: 70-6); such local cases cannot be said to lead to the same form of grammar optimization as the optimization driven by the much more global rules and constraints of UG. It would, therefore, be simpler if it could be shown that analogy works in the same way in all cases.

The positive aspect of Kiparsky's proposal is that it rejects the process of grammaticalization *itself* as a cause or mechanism for change. He emphasizes that the definitions of grammaticalization given in the literature do not work because the different aspects of grammaticalization "do not have to march in lockstep", and because one aspect is not "a necessary consequence" of another; rather, grammaticalization as described "pick[s] out separate and more or less loosely parallel trajectories of change" (ibid: 4).

Below, analogy will be looked at in more detail; attention will be paid to analogy as a deep-seated cognitive principle that is not only relevant to language processing and language change, but also to learning processes outside language. I will stress that analogy is used to categorize, and that categorization involves both concrete and abstract linguistic signs. In addition, the ability to analogize is evolutionary old and present in other mammals too. Finally, it is an important mechanism in language acquisition (cf. Slobin 1985; Tomasello 2003a), and in the processing of language in general (cf. Berg 1998). If we accept that the system of grammar that each of us acquires in life should be an empirical psychological/biological model, and

not some abstract linguistic model that has no relation to our psycho-biological make-up, then this system should reflect human processing, and the key to this should be found with the help of advances in neuro- and psycholinguistics. Berg (1998: 278) writes: "The structure of the language is shaped by the properties of the mechanism which puts it to use". The more the same mechanisms are seen to operate elsewhere, the more persuasive they become.

3. Analogy: its nature and the role it plays in linguistic modeling and change

Analogies can be very concrete or quite abstract; that is, an analogy may be based on concrete lexical items as well as more abstract schemas. Analogy is also a highly fluid concept and therefore works quite differently from the type of global rules favoured by generative linguists. Hofstadter (1995: 198) gives an example of the fluidity of analogical thinking on the very concrete level of language use. He describes analogy as 'conceptual slippage' and argues that this slippage is important in order to keep language workable and flexible. It is to be preferred to a rigid system:

> *And one last example from this genre, perhaps my favorite ... A grocery-store checkout clerk asked me, 'Plastic bag all right?', to which I replied, 'Prefer a wood one ... uhh, a ... a* paper *one, please.' Contributing towards this slip might have been the following factors: paper is made from wood pulp, grocery bags are brownish, somewhat like wood and unlike standard paper, they are also considerably 'woodier' in texture than ordinary paper is, and plastic and wood are both common materials out of which many household items are made, whereas paper is not.*

> *Substitution errors like these reveal aspects of the subterranean landscape – the hidden network of overlapping, blurred together concepts. They show us that under many circumstances, we confuse one concept with another, and this helps give a picture of what is going on when we make an analogy between different situations. The same properties of our conceptual networks as [sic] are responsible for our proneness to these conceptual-halo slips make us willing to tolerate or 'forgive' a certain degree of conceptual mismatch between situations, depending on the context; we are congenitally constructed to do so – it is good for us, evolutionary speaking. (Hofstadter 1995: 198)*

As will be seen below, this 'conceptual mismatch' also takes place on a more abstract level, that of the system, once patterns have been formed.

Analogical rules are typically not across the board but work in local areas. Analogical learning starts with concrete situations and is based on experience, both linguistic and situational, just like the kind of analogical reasoning that we saw in Hofstadter's example, which also depends on a situation and on

previous experience. In learning, the analogies may become more and more abstract by means of what Slobin (1985) has called 'bootstrapping'. That means that abstract patterns deduced from concrete tokens begin to form a system provided these tokens occur frequently enough. The most frequent concrete and abstract patterns (i.e. idiomatic phrases, such as *He kicked the bucket*, and grammatical schemas, such as the English NP consisting of [(Det) (Adj) Noun]) become automatized and will become part of our lexical and grammatical knowledge.

The advantage of a usage-based grammar (i.e. a grammar that is the result of actual learning), such as the one indicated here, is that no distinction is made between lexical items/phrases, and grammatical words/schemas (as in Construction Grammar).[14] Lexical items are learned first; patterns, both concrete and abstract, follow from that. The learning itself takes place by what Slobin (1985) and Peters (1985) have called 'operating principles'. These are general strategies, based on analogy, on recognizing what is same and what is not-same, and drawing conclusions from that. These same/different operations are performed on linguistic utterances in context, on the form as well as the situated meaning of the utterance, in which frequency plays an important role. The same analogical procedures also provide us with the ability to build up categories (like Noun, Verb) and syntactic structures (cf. Itkonen 2005; Wanner 2006).

In analogy both iconic and indexical forces are important (as is clear, for instance, from the quote from Hofstadter above, when he used "wood" instead of "paper" because paper is made of wood (indexical) and because the bag looks in colour and texture a bit like wood (iconic). The strong interconnections between the indexical and the iconic are clearly indicated in Anttila's (2003) 'analogical grid', whose paradigmatic and syntagmatic axes represent the 'woof and warp of cognition'. Anttila emphasizes that all linguistic signs (which include both concrete lexical items and structural patterns) are double-edged, they are combinations of form and meaning.[15] Even more importantly, in view of the force of analogy, he stresses that

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[14] Cf. Tomasello (2003b: 9), who notes in Langacker's words that language is a "structured inventory of symbolic units" each with their own form and function. He points out that there is no tidy distinction between lexicon and grammar, and that, for instance, idiomatic constructions of the type *Him be a doctor!*, do not fit the lexicon because the construction is productive, nor the grammar of English since it doesn't follow the rules.

[15] This is also the accepted idea in construction grammar, where constructions from the lowest to the highest levels form a network of intersecting connections (cf. Goldberg 2006: 18; Noël 2008). Similar ideas about the organization and storage of linguistic knowledge also underlie neural networks and connectionist models.

similarity relations exist in both form and meaning. Meaning is related to the function an object/sign has.[16] It is clear that signs may end up in the same paradigmatic set because their referents are seen to be similar in function. For instance, items like *apple*, *pear*, *banana* etc. do not form the set (sign) *fruit* so much on the basis of similarity of form/colour, but on the basis of similarity of function, i.e. they are all plucked, eaten, peeled, enjoyed in similar ways. [17] The analogical grid implies a close bond between the form and the function of a sign; it applies to all meaningful units, from the smallest morphemes, to complex words, but also to larger and more abstract (morpho)syntactic structures. Because form and meaning form a whole, a meaning change may affect the form, but change may also be driven by lexical items similar in form or by the more abstract formal requirements of the system. That form may drive meaning is nicely illustrated on a lexical level by Coates (1987), who shows how folk-etymological changes are often shaped by similarities in form.

Analogy is a basic force not only ontogenetically but also phylogenetically. Deacon (1997) shows that the grammatical, symbolic (i.e. abstract/arbitrary) system that became part of human language in the course of evolution was built up incrementally on the basis of the iconic and the indexical modes of thinking, guided by evolutionary old cognitive principles (i.e. the ability to see similarities and differences, the ability to categorize), which are also at work in other (non-linguistic) domains.

Iconic relationships are the most basic means by which things can be represented and it is the foundation on which all other forms of representation are built. What is important here is that iconicity depends on recognition, and recognition depends on the interpreter. When we interpret the world around us in terms of similarities and differences, we learn to see only differences which are functional or relevant, gradually ignoring non-functional ones. In other words, we don't learn and remember more than is absolutely necessary. This is what Hawkins (2004: 40) has called the principle of 'Minimize Forms':

> *Minimizations in unique form-property pairings are accomplished by expanding the compatibility of certain forms with a wider range of properties [meanings]. Ambiguity, vagueness, and zero specification are efficient, inasmuch as they reduce the total number of forms that are needed in a language.*

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[16] Note that the relation between the sign and its meaning/function is in itself indexical; children learn the meaning of linguistic signs because they are linked to a particular situation.

[17] Itkonen (2005) emphasizes that both function and form work analogically, and strengthen each other.

Hawkins continues that this minimization is connected with the frequency of the form and/or the processing ease of assigning a particular property to a reduced form. The ambiguity that arises is no problem since "[t]he multiple properties that are assignable to a given form can generally be reduced to a specific P[roperty] in actual language use by exploiting 'context' in various ways" (ibid: 41). For example, we learn to recognize phonemic and ignore phonetic distinctions in the course of language acquisition because the latter are not functional. In other words, it is more economic to ignore these differences.

What I am suggesting is that in the course of both language evolution and language learning, and hence also in language change, the same analogical reasoning keeps playing a role, whereby abstract items/structures gradually evolve from concrete (lexical) items constituting what Holyoak/Thagard (1995) have called 'system mapping'.[18] System-mapping led to the evolution of grammar; it is still basically followed by children when they build up their grammar; and it guides language processing all through our lives. The exact path is not the same in all three domains because the input is different and keeps changing, but the same analogical principles are at work each time. An additional advantage of the analogical learning system is that there is only one system to begin with, i.e. a lexical one. It is therefore more parsimonious from an evolutionary point of view, and it better fits present neurological findings and the ideas developed about neural networks.[19]

In a frame like the above, analogy is both a mechanism and a cause. By means of analogy we may arrange linguistic signs (both concrete and abstract) into (other) paradigmatic sets, but it is also analogy that causes the learner to build up more abstract schemas, and to keep the number of these to a minimum (so it is a form of 'grammar optimization', but more local than suggested by Kiparsky (forthcoming), and always exemplar-based). In this learning model analogy is the primary force and not reanalysis. Reanalysis is what a linguist may see from the point of view of what changes in the system between generations or in the language output in the course of time, it is not

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[18] Cf. Anttila (1977: 69) who writes that 'all change mechanisms have an analogical ingredient.'

[19] This also enables us to see lexicalization and grammaticalization as basically the same process, but with different results based on different inputs (cf. Fischer 2007: 228-9). Goldberg (2001: 66) found that "knowledge of word meaning is not stored in the brain as a separate, compact module". He also notes that the search for dissociations to establish the autonomy of a grammar module is fallacious in that for "every case of strong dissociations there are hundreds of cases of weak dissociations, where many functions are impaired together"(ibid: 56).

something that speakers actually do. Speakers do not reanalyse, they substitute one pattern holistically for another.[20]

Analogy is often seen as too loose, and therefore impractical or unworkable as a principle within a linguistic model. But indeed, it is not a principle of the system or a principle of language(-change), it is a faculty of language users. As Hofstadter (1995) emphasized, the conceptual mismatch that analogy represents, is in fact its strength: its flexibility keeps the system oiled. This is not to say that our analogizing capacities are not controlled. They are. The 'looseness' of analogy will be much constrained if one thinks of analogizing as taking place on different levels, and on concrete as well as abstract categories, all connected in tight networks. The possibilities are also constrained by the fact that the patterns and the paradigms are organized both semantically and structurally since each linguistic sign or token, be it single or complex, is, because of its binary nature, part of formal (sound-shape, structure, position) as well as semantic categories.[21]

This means that in order to discover how exactly analogy plays a role in grammaticalization processes or in change in general, one cannot concentrate on the development of one particular structure or (combination of) lexical item(s) only, one has to consider the change in terms of the network that the construction/item operates in. To get an idea how this works, it is useful to consider what happens in actual processing. Berg (1998) has looked at processing errors (and what causes them) as a way of determining the structure of the grammatical system. [22]

Berg makes a distinction between contextual and non-contextual errors. He shows how errors depend on "similarity constraints 'elsewhere'" (1998: 173). Thus, an error like *cuff of coffee* is much more likely to occur than *hit the roop*. In both cases there is a [p]/[f] interchange, but in the first case the error is caused syntagmatically (by *coffee*),[23] and in the second

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[20] If indeed we see constructions as "cognitive schemas of the same type as we find in other cognitive skills, that is, as *relatively automatized procedures for getting things done*" (Tomasello 2003b: 10, emphasis added), then it is also more likely that analogy rather than reanalysis is at work in processing, as the latter would entail some form of deliberation. Cf. also Bybee (2003: 155), who notes that speakers have no conscious access to grammatical knowledge, the latter "resembles procedural knowledge".

[21] Cf. Berg (1998: 58ff.) for the description of such a network as a possible psycholinguistic model.

[22] Cf. Berg (1998: 165), who writes: "if the key to diachrony is to be found within synchrony – we should expect the patterns of language change to mirror the patterns in speakers' and listeners' spontaneous behaviour".

[23] This is similar to priming, which interestingly enough is discussed by Jäger/Rosenbach (2008) as a possible cause for the unidirectionality of grammaticalization. However, as I will suggest below, it is

paradigmatically (i.e. [p] and [f] belong to the feature set of voiceless labials). Interestingly enough, with higher-level errors involving meaningful elements, *non*-contextual errors are much more likely to occur. Berg (1998: 165) gives the following example: *Muß sie es noch mal ticken – tippen?* ('Does she have to retype it?'), which he describes as an error that is "neutral with respect to the similarity scale, as there is nothing to compare [it] with"(ibid: 166), i.e. there is no [k] around in this case to cause the [p] in *tippen* to change to [k]. The interesting thing, however, is that both *ticken* and *tippen* are possible words in German. Moreover, semantically and formally they are very similar: both are verbs, they look alike phonetically, and both refer to a light, repetitive ticking sound.[24] Quite clearly, here, the error is of a paradigmatic kind, showing similarity on a deeper level of mental organization.

I would suggest that processing errors of the paradigmatic, non-contextual kind are more likely to be innovations that could result in actual change than contextual ones because the influence of paradigms in the grammar-system is likely to be stronger than the influence of context. The latter is bound to be variable, it being part of the actual discourse, while the former is much more stable, paradigms having become part of the system through learning and repeated use.[25] It has been shown in Analogical Modelling that changes in the morphological system are heavily constrained by the different paradigmatic sets that an item is part of (cf. Chapman/Skousen 2005).

Although such constraints are much more difficult to establish in the area of syntax (because the paradigmatic choices are so much wider; cf. footnote 10), promising work has been done here too showing that the development of constructions is not a linear affair (affecting only the particular construction under discussion) but 'starlike', influenced by other constructions that

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probably the paradigmatic axis, rather than the syntagmatic one involved in priming, which plays the more important role in change.

[24] Onomatopoeia could play a role here, and even bilingualism or language contact if the speaker is familiar with another language like Dutch, where this verb would have a [k]. Recent research has shown that words of different languages are stored in a common lexicon and are accessed non-selectively, and that, although task-dependent, its first processing stages might remain unaffected by nonlinguistic contextual factors, cf. van Heuven et al. (2008) and studies referred to there.

[25] Of course when the context is fixed, as in grammaticalizing or lexicalizing constructions, then the construction itself can undergo change (phonetic attrition, bleaching, bonding etc.). But note that even here, a change involving a different category (e.g. from lexical verb to auxiliary) usually is due to paradigmatic similarity too, as argued above with respect to *going-to*. In a wider situational context, grammaticalization can also be driven by pragmatic inferencing in its first stage. For this to happen, the same situational context needs to be frequent. Note that here too analogy is involved because the inferencing depends on a comparison with previous situations in which the same structure occurred.

resemble them formally and/or semantically. DeSmet (2009, forthcoming) argues convincingly that certain cases that traditionally were seen as instances of reanalysis are better explained (in terms of the available data) as being driven by the presence of analogical forms elsewhere. Looking at the spread of the 'new' *for*-NP-*to*-V construction (with *for* functioning as complementizer and NP as subject) in English, he shows that this new construction became available because it was cast into the mould of an older but formally identical *for*-NP-*to*-V construction, where *for* was part of the infinitival marker *for... to* and the NP the *object* of the infinitive. The latter disappeared because the OV pattern itself was cast into the mould of the by then more regular Middle English clause-pattern, i.e. SVO, so that any NP before a verb came to be interpreted as subject rather than object. This explains better than the reanalysis story why the new construction doesn't first appear as extraposed subject (as one would expect with reanalysis), and why there is an early predominance of passive infinitives. Another paradigmatic factor that facilitated the spread of the 'new' construction to more and more verbs was the analogy between the *for*-NP (in the subject-construction) that looked formally similar to the *for*-NP found as a prepositional object with the *same* verbs, causing the spread of the new subject-construction to other verbs taking a *for*-PP.

Other cases investigated show that grammaticalization doesn't necessarily follow a gradual linear path but constitutes an abrupt process by analogy (Bisang 1998, Noel 2005). Fischer (2007: 274ff.) shows that in the cline from adverbial adjuncts to pragmatic markers in English, some of the pragmatic markers were attracted to the pattern directly via analogy, or via another pattern, that of reduced modal clauses. Similarly, she argues that in the development of English epistemic modals, there was no direct path from deontic to epistemic use. Epistemic meaning arose through functional and formal analogy with pairs of constructions like *he seems to be…/it seems that he…*, which enabled the *it must be that he…* to be replaced by *he must be…*. These solutions are more commensurate with the philological facts and, as a further bonus, obliterate the problem that they do not neatly follow Lehmann's parameters in terms of scope.

4. Concluding remarks

Grammaticalization as a process only 'exists' on the language-output level. It may involve universal paths and may look unidirectional but this is not something intrinsic to the process on the speaker-listener level. As a process, it is an analyst's generalization, a convenient summary but not something that

has actually 'happened' (cf. McMahon 2006: 173). Its apparent universality and directionality is caused by the fact that the lexical source items which are involved in it are (i) part of the basic vocabulary, (ii) as such are relatively frequent, (iii) are therefore likely to be phonetically and semantically reduced, which in turn (iv) makes them more eligible than other linguistic signs to function in abstract structural patterns. There is, however, no necessity about the development.

Language change can therefore not be *explained* in terms of grammaticalization. Grammaticalization occurs, and is often of a homogeneous 'type', especially when a form/construction through frequency has eroded so much that it becomes part of a drift,[26] but what ultimately decides whether a linguistic sign becomes part of a user's grammatical system is whether it resembles in some ways (semantically, formally or both) an already existent category. Grammaticalization does not lead to new grammatical structures in any general sense (pace Meillet 1912, Bybee 2003, Kiparsky forthcoming, Traugott 2008: 154) except perhaps in cases of substratum or long-term contact, where new structures may enter through bilingualism or imperfect learning.[27] This may introduce genuinely new structures (but they would still be based on the analogy of contact/substrate structures), which may then be used as a pattern.[28] I have tried to show that reanalysis is an analyst's concept; in terms of language *processing* it is based on our ability to analogize. This ability is steered by frequency, and it

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[26] If we see this in terms of a complex adaptive system (cf. Ritt 2004), the unidirectionality of grammaticalization could be explained by the fact that in case of a choice, the most successful variant will be replicated, causing older variants to be lost (unless each variant can continue in separate paradigms as with *going to/gonna*). Since grammatical function items are more frequent, and their reduced phonology is neuronally more economical (involving less cost), they will tend to replicate successfully, and hence become even more frequent, and more reduced over time.

[27] This would explain, for instance, why the future clitic *'ll* in English will not continue on the cline towards an affix, because the system of English does not allow inflectional *pre*fixes on the main verb, and a tense-*suf*fix on the preceding pronoun is unlikely to occur for semantic reasons (see Fischer 2007: 198, pace Hopper/Traugott 2003: 141).

[28] It would be interesting to learn more about how indeed new categories develop, such as for instance the determiner system in English. Is analogy (it being based on a similarity with an existing item/structure) still possible in such a case? McColl Millar (2000) suggests that contact may have played a role, Schlüter (2005) and Sommerer (2008) see influence from existing rhythmical patterns. In both cases analogy could still be at work.

includes analogical expansion, thus covering all the important factors mentioned under (iv) in section 1.

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