On analogy as the motivation for grammaticalization

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Abstract:

The number of phenomena which are gathered together under the term 'grammaticalization' is quite large and in some ways quite diverse. For the different types of grammaticalization similar motivating factors have been suggested, similar principles, clines and hierarchies. Some of Lehmann's (1982[1995], 1985) parameters, which have long been considered to characterize processes of grammaticalization, are now under attack from various quarters, and indeed the phenomenon of grammaticalization itself has been questioned as an independent mechanism in language change. This paper addresses a number of problems connected with the 'apparatus' used in grammaticalization and with the various types of grammaticalization currently distinguished. It will be argued that we get a better grip on what happens in processes of grammaticalization and lexicalization if the process is viewed in terms of an analogical, usage-based grammar, in which a distinction is made between processes taking place on a *token*-level and those taking place on a *type*-level. The model involves taking more notice of the *form* of linguistic signs and of the *synchronic* grammar system at each stage of the grammaticalization process.

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On analogy as the motivation for grammaticalization

1. Introduction

Grammaticalization has become a popular subject in the course of the last twenty years (cf. Joseph 2004), and over time it has come to include more and more phenomena under its wings (cf. Campbell and Janda 2001 for a convenient overview). Handbooks of grammaticalization (e.g. Hopper and Traugott 2003[1993], Diewald 1997) include such processes as:

(1) *Types of grammaticalization*

i. the development of syntax out of discourse (including the fixation of word order)

ii. the grammaticalization of lexical items into function words (grammaticalization vs lexicalization)

iii. clause combining and clause fusion

iv. subjectification

For all these different types similar motivating factors have been suggested, similar principles (e.g. unidirectionality, layering, divergence), and similar clines, the latter both of a formal and a semantic/pragmatic nature. It is evident that not all of these factors/principles work out neatly in practice for each particular type (let alone each particular case) of grammaticalization (which has led some linguists to conclude that grammaticalization is an epiphenomenon, cf. the discussion in Campbell 2001a,b; Fischer *et al.* 2004a,b). Thus, Tabor and Traugott (1998), supported recently by Roberts and Roussou (2003), have suggested that one of Lehmann's (1982[1995]) parameters, the parameter of scope reduction, does not work in (iv) subjectification, where we see scope increase rather than reduction, and they suggest that it may also not be valid in some other cases of grammaticalization given here as type (ii).

Another problematic area in grammaticalization is the distinction between lexicalization and grammaticalization, which, as many linguists have observed, is often hard to make.[1]

In this paper, I intend to take a fresh look at some of Lehmann's parameters (to a large extent these cover the same ground as Hopper's [1991] principles), which for a long time were considered to be useful and stable principles of grammaticalization, in order to find out what their value is in cases generally referred to as cases of grammaticalization. At the same time and more importantly, however, I want to address the problem of the *status* of grammaticalization as an independent causal mechanism. I believe that the notion of grammaticalization can be useful as a heuristic device to discover changes that have taken place in language and to understand why changes often follow similar pathways but I think it is not correct to elevate grammaticalization to some higher status, to some independent mechanism of change as has been done in some of the recent literature on grammaticalization (for more detail, see section 2).

The paper thus has a twofold aim. First of all, it will test the usefulness of Lehmann's parameters both with reference to the recent objections that have been made to it in terms of scope, and to find out in how far the parameters still function in the ever-widening domain of grammaticalization (cf. the types indicated in [1]). Secondly, I wish to show that a closer look at the workings of analogy – in terms of a usage-based analogical model – may provide a better, because more basic, understanding of the type of changes that are considered instances of grammaticalization than the grammaticalization framework itself.

I agree with the linguists whose papers are collected in Campbell (2001a), and other critical voices such as Newmeyer (1998) and Lightfoot (1999) that grammaticalization is best considered an epiphenomenon. These linguists emphasize that the mechanisms that operate in grammaticalization (such as phonetic reduction, semantic bleaching, reanalysis etc.) are not unique to it but also operate elsewhere in language change. Although in grammaticalization

these mechanisms often occur together, it does not therefore follow that they are part of some higher, unitary force. I believe that a better understanding of the workings of analogy will help to clarify the issue in that it will show that each step in a process of grammaticalization is in fact independently taken; that is, it is not caused by the grammaticalization process itself but it is the result of a speaker's analogical thinking in combination with the content of his grammar. Thus, each step concerns a replacement of one construction, or linguistic sign, by another. This replacement is based on similarities, both in form and function, between the old structure and other structures that exist for the speaker, causing conceptual, but understandable, mismatch' (cf. Hofstadter 1995). This mismatch leads to new structures being used, which often involve a simplification of the speaker's overall grammatical system.

I also follow Joseph (2004: 47) when he states that the grammaticalization framework is problematic because it "is often ahistorical, not giving due consideration to the full range of information about the steps in a particular development", and because it is "often asynchronic as well, with only vague synchronic analyses given, even though understanding the historical development generally depends crucially on understanding the synchronic status of a given element at various stages".

The paper is structured as follows. In section 2, the two aspects touched upon by Joseph in the quotation above will be addressed, that is, the need to look at "the full range of information" both diachronically and synchronically. I will first emphasize the importance of the indivisibility of the form and function of the linguistic sign (both on the morphemic level and on higher syntactic levels) and stress the need to look beyond pragmatic-semantic motivation for grammaticalization. Secondly, I will address the need to look at the process of grammaticalization from the point of view of the speaker, that is, we should consider how the structure that is said to grammaticalize is embedded in the synchronic system of grammar that is part of the speaker's acquired knowledge. Here too, both form and function are intimately

related. Having established the importance of both form and function, we will then turn, in section 3, to a consideration of a usage-based grammar model and the role played by analogy in such a model. I will argue that grammaticalization derives from more fundamental principles, which are connected with principles of human cognition; principles which are at work not only in language change but also in language acquisition. To make the discussion more concrete, I will illustrate both aspects of my paper with examples of change from the history of English that have been interpreted as instances of grammaticalization; this will be the topic of section 4. The discussion will be rounded off by a brief conclusion in section 5.

Before we turn to the importance of both form and function, and the ahistorical and asynchronic aspects of the grammaticalization framework in the next section, it will be useful to give a summary of Lehmann's (1985: 306) parameters, which play a main role in this paper. They are given in Table 1 below. I have slightly adapted them in order to indicate the processes taking place. The parameters illustrate the degree to which a particular linguistic item has grammaticalized.

[place Table 1 about here]

The main grammaticalization features characterized in Table 1 are given in somewhat more accessible form in (2):

(2) i. phonetic and semantic reduction (phonetic 'erosion' and semantic bleaching)

ii the (formal) fusion of elements/clauses (this also concerns the role of 'lexicalization')

iii reduction of scope

iv reduction of choice within a paradigm

v reduction of choice within a clause (i.e. elements become obligatory and fixed in position leading to strict word order).

2. Form and function of the linguistic sign

Some of the problems that exist with reference to the grammaticalization types in (1) are connected with the 'apparatus' used in grammaticalization. To understand these problems and move towards a solution, I will suggest that more notice should be taken of formal matters and more attention should be paid to the role of the *speaker* (which I will here use as a general term for speaker as well as hearer). As a combination of these two factors – viz. the roles played by both *form* and *speaker* – I will emphasize, in particular, that we should not neglect the overall system of grammar (or more precisely, the conventional grammar acquired by each speaker-learner within a particular language community) that underlies the communicative situation in which each particular aspect of the grammaticalization process takes place.

Grammaticalization linguists concerned with diachrony look at form as well as function (or meaning), but they do so mainly from the point of view of the language as a historical object that floats through time, as if it were divorced from speakers and from their system of grammar. In other words, as Janda (2001) and Joseph (2001, 2004) have emphasized, in these diachronic studies the speaker has receded into the background. Such a view can be observed, for instance, in the typological approach to grammaticalization as seen in the work of Haspelmath (1989, 2004), Bybee *et al*, (1994), Heine and Kuteva (2002), and others. The focus in these studies is on typological pathways that can be used as guiding principles or universals to observe and explain change.

In the more synchronic semantic-pragmatic approach to grammaticalization, as found in the work of Traugott (e.g. 1982, 1989, 1995), Sweetser (1990),and Kuteva (2001) among others, the speaker and the communicative situation *are* considered, but here it is the matter of

form that gets rather short shrift. The latter approach is mainly concerned with pragmatic-semantic motivation, with functional and communicative needs.

In fact, in both approaches to grammaticalization, the synchronic and the diachronic, meaning plays a more primary role than form, as is clear from such remarks as given under (3):

(3) i. "grammaticalization can be interpreted as the result of a process which has *problem-solving* as its main goal, its primary function being conceptualization by expressing one thing in terms of another" (Heine *et al.* 1991: 150, endorsed by Hopper and Traugott 2003: 92)

ii. "grammaticalization is the result of *conceptual* manipulation", in which "conceptual chaining *precedes* morphosyntactic chaining" (Heine *et al.*1991: 174)

iii. "grammaticalization is not distinct from other kinds of semantic change" (Hopper 1991: 19)

iv. by "applying the hypothesis that *semantic change is predictable*", we may "postulate earlier versus later uses of a single gram […] "as stages on a grammaticalization path" (Bybee *et al.* 1994: 17-18).

v. "[t]hese modifications [i.e. reanalysis and analogy at work in grammaticalization] comprise changes in interpretation […] *but not at first change in form*" (Hopper and Traugott 2003: 39)

(emphasis added in all cases except i)

Related to this is the idea that grammaticalization is an independent process (independent of speakers), as, for instance, expressed in the words of Bybee *et al.* (1994: 298):

> Thus our view of grammaticization is much more mechanistic than functional: the relation between grammar and function is indirect and mediated by diachronic process. The processes that lead to grammaticization occur in language use *for their own sakes* (emphasis added).

A similar idea is expressed by Vincent (1995: 434), who writes in an article which challenges the pre-eminence of grammaticalization as a source of new patterns, that he does not "wish … to deny the power of grammaticalization as an *agent* of change" (emphasis added).

To summarize, the main-stream grammaticalization framework, as represented in the work of the linguists referred to above, presents problems concerning its ability to explain change in that it does not take account of the full picture. It relies too much on the pragmatic-semantic factors operating in change. It ignores form as a *motivating* factor because formal changes are generally seen as a mere by-product of semantic change. It also does not consider the overall system in which a change is taking place, which likewise may influence the process. It will be shown below in section 4 that other constructions present in the language, contemporaneous with a particular construction believed to be grammaticalizing, may indeed influence its development. I will present arguments that show that grammaticalization is not necessarily a linear or unidirectional process, in which a particular construction gradually changes or grammaticalizes, as it were of its own accord. Rather, it will be shown that it may be affected on all sides by contemporanious structures that are similar to the one undergoing change in both form and function. In other words, the process may be one of replacement of one construction by another rather than gradual change restricted to the construction undergoing the change. This is not to deny that a change often follows a similar pathway, but the point is that it need not do so. In Fischer (1997) I have shown, for instance, how the grammaticalization of the infinitival marker *to* in English diverges from the more usual grammaticalization path that such markers follow (as described in Haspelmath 1989) because

of other changes taking place in the grammar system of English (for more detail see note 15 below).

3. Usage-based grammar, neuronal grammar and analogy

In order to understand what happens in grammaticalization processes and what role is played by analogy, I will make use of a usage-based type of grammar, such as recently proposed by Tomasello (2003b), which is conceptually closely related to the models of Construction Grammar (as put forward by linguists such as Fillmore, Croft, Langacker etc.) and Dependency-type grammars (such as Lexical Functional Grammar or Head-driven Phrase Structure Grammar). A usage-based grammar should ideally be linked to neuronal processes in the brain, and it is therefore useful to look at neuro-linguistic connectionist models (such as discussed in Pulvermüller 2002) and at linguistic processing models, such as Analogical Modelling. Quite a lot of Analogical Modelling has been done in the area of morphology (cf. Skousen 1989, 1992, Baayen 2003, Chapman and Skousen 2005),[2] and rather less in syntax, but there is an interesting but not very well-known attempt to use analogy by Itkonen and Haukioja (1997) (and see also Itkonen 2005, and Wanner 2006 for recent general studies discussing the primary role of analogy in both language learning and change).

3.1 Ontogenetic and phylogenetic considerations: The importance of analogy

A usage-based grammar should make sense from both an ontogenetic and phylogenetic point of view; ontogenetic, because children must be able to acquire it, and phylogenetic because the grammatical system is the conventional result of a long evolutionary process of language development, in which speakers culturally transmit the language (including its system) from generation to generation.

Let us first look at the ontogenetic link. Tomasello (2003b: 321) mentions three basic processes involved in children's language learning and language use:

(4) *Processes important for language development in ontogeny*

i. *Intention reading* and *cultural learning*: this implies the ability to imitate and take the perspective of others, which enables children to learn how linguistic 'symbols' are linked to objects/propositions in the communicative setting

ii. *Pattern-finding*: the ability by means of analogy to create abstract syntactic constructions and categories out of the concrete pieces of language they have heard

iii. The *entrenchement* and *competition* of linguistic forms help children to constrain their abstractions to those that are conventional in their linguistic community

These processes also play a primary role in language evolution. Pattern-finding is an ability that is common to all primates and is also found in lower-order animals (cf. Deacon 1997, 2003, and for an overview Fischer 2004a). Intention-reading presents a more advanced stage and is something only fully developed in humans. For imitation and intention-reading one needs a sense of self, which children develop early, but which has only been found to be marginally present in chimpanzees (cf. Vihman and DePaolis 2000, Arbib 2003). Tomasello (2003a: 98) argues that the emergence of symbolic reference, typical only for humans, is connected with the emergence of intention-reading. He writes: "a strong argument can be made that children can only understand a symbolic convention in the first place if they understand their communicative partner as an intentional agent with whom one may share attention".

As to the phylogenetic aspect, Deacon (1997, 2003) makes clear that the basis for symbolic thinking is formed by earlier iconic and indexical reference systems, which higher-order animals share with humans. Unlike symbolic signs, which are more abstract or

autonomous and have to be learned by convention, iconic and indexical signs are *motivated* by their surroundings, and hence easier to learn. The recognition of iconic signs involves the ability to see similarities and differences between entities (i.e. between two objects or, linguistically, between a sign and its referent or between two signs), while indexical signs involve the ability to see cause and effect or an associative link between two objects (or between a sign and what it refers to, or more abstractly between a sign and a contiguous sign).

Thus, apes can see a relation between the picture of a banana and a real banana (iconic sign) and between an alarm call and the danger represented by it (indexical sign). Trained apes are able to advance a little further in that they may learn a small number of purely symbolic (i.e. arbitrary, non-motivated) signs. Deacon (1997: 65-68), however, shows that this normally happens only if the showing of these symbol-signs is continually stimulated or connected with rewards (which could be seen as an abstract form of indexical reference). When that connection is lost, apes usually lose interest in the sign.

Symbolic reference thus is possible via a higher, more abstract form of iconic and indexical thinking. Pattern-finding begins in animals and humans with an awareness of iconic concrete relations (similarities and differences) between one object and another (i.e. between individual 'tokens'), and with learning the indexical relation between an object and its function/use, so that, in their struggle for survival, they know, for instance, what is good to eat and what to avoid, which animal to trust and which to flee. At a more advanced stage, the *repeated correlation* between an object and its use leads to a higher-order level of iconicity and indexicality. It is a higher, more abstract level, because they learn by an *analogical generalization* that any object that looks like object *x*, is also bound to have function *y*. The comparison is now no longer based only on the immediate context but also on a collection of past experiences, on an abstraction (cf. Itkonen 1994). They begin to learn to recognize what I will call *types* from past *tokens*.

All this is still part of animal brains as well as ours. Symbolic representation is one step further still in that at this level the combined iconic/indexical relation (which Anttila [2003] calls the 'analogical grid'; more on this below in section 3.3) begins to be used separately from the individual context, object or occasion in or for which it was first learned. Symbolic reference happens when we transfer the referential functions from one *set* to another *set*. In the earlier learning, there was iconic overlap between the members within a set; at the higher symbolic level, we distinguish a pattern that distinguishes a set as a whole, and we can then apply this same pattern to another set. Holyoak and Thagard (1995) have called this 'system mapping'. It again involves analogy but on a more abstract level. Holyoak and Thagard present us with some simple examples. For example, humans can see a similarity between a sample presenting two trees and a sample presenting two frogs (Figure 1).

[place Figure 1 about here]

The pattern that they discern is the *isomorphism* of the *combination of two of the same things.* Humans would not see an analogy between a sample presenting two trees and another one presenting a frog and a tractor (Figure 2) because here the higher order (iconic) pattern *two of the same* does not apply.

[Place Figure 2 about here]

Non-human primates, on the other hand, are not able to see this higher, more abstract analogy without extensive training, which crucially involves language training (Holyoak and Thagard 1995: 50). Children begin to understand this relation-mapping or system-mapping from the age of about 3 onwards and would be able to solve the above analogy without help by about age 4 (*ibid.*: 87ff.).

3.2 Language processing: Neuronal grammar models

Before we turn to a somewhat simplified picture of how a usage-based grammar (based on the 'analogical grid') might be built up and what it involves, we need to briefly mention another necessary link with the system of grammar, i.e. the processing of language in our brain. This will only be a small detour at this point. It is meant to give an indication of possible future developments in grammatical modelling which may strengthen the analogy approach advocated here. The neuronal approach also indicates that both functional and formal models of grammar are helpful to achieve a deeper understanding of the nature of language. Since, however, neuronal models are still only in their infancy, no further discussion of their use will be attempted here. I will only indicate useful links between these models and my proposals when appropriate.

Most generative linguists consider grammar to be a biological organ. We can, therefore, only achieve a reconciliation between formal and functional models of grammars (needed to achieve the necessary link between form and meaning) if we take note of what happens physiologically in the brain during language processing. Pulvermüller (2002: 272), in his study of neuronal grammars, writes that it would be "advantageous to attempt to connect one's terminology to the putative mechanisms" of a neuronal grammar. He continues: "Using neuroscientific knowledge and data for guiding linguistic theorizing appears to be fruitful […] to explore the space of possibilities", adding that "a neuronal language theory may be a necessary condition for deciding between alternative approaches to grammar".

Pulvermüller (2002) presents a possible model for a neuronal grammar. A highly simplified but I think basically accurate description of the main aspects of his model is as follows. Pulvermüller's (p. 161) proposal builds upon the idea that the mechanism of *mediated sequence processing* may be responsible for processing the serial order of

morphemes and words. Each word or morpheme (A, B, etc) is presented by a *neuronal set* or *functional web* (α, β etc. respectively). The information concerning the form and meaning of a word/morpheme is seen as processes within one functional system (cf. pp. 200; 248). In other words, form and meaning are closely linked, and a neuronal set (or functional web) contains information having to do with phonetic-phonological and lexico-semantic features of a morpheme/word (p. 88).

There are four possible activity states that a neuronal set can be in: *ignition, priming, reverberation*, and *rest*. Ignition and rest are each other's opposites (digital), while priming and reverberation are analogue in nature. The first word in a sequence is always ignited. Ignition is followed by reverberation, which may prime the next element in a sequence. Priming can be seen as a kind of pre-activity, it may be followed by ignition (provided another priming from another neuronal set takes place) or by non-activity (if the priming is not enhanced). The principles behind mediated sequence processing are "grounded in neurophysiology and neuroanatomy" and are "as such, genetically determined, or at least under strong influence of the genetic code." Everything that goes beyond the neural mechanisms is "assumed to be the result of associative learning" (p. 247), i.e. not innate.

In the processing of grammatical or 'congruent sequences' the first input word A, represented by a neuronal set or functional web α, after it has been ignited, reverberates and primes the next element in the sequence, β (representing word B), which, if it presents a possible successor word, is also ignited. These two elements together, ignite a neuronal *sequence set* γ (more on sequence sets, below). If a construction is ungrammatical or presents an 'incongruent sequence', then β, although primed by α, does not ignite, nor does the neuronal sequence set γ, which needs two elements to be ignited. If the sequence set γ *is* ignited and primed, 'processing is followed by a wave of ignitions running from β to the

sequence set and back to α, leaving all neuronal sets in the highest state (…) of reverberation' (pp. 183-84). This backward wave of activity is *not* created by an ill-formed string.

In connection with sequence sets, a few things have to be noted. First of all, there are two types of sequence sets (or sequence detectors), so that they may detect forwards as well as backwards (p. 191). Secondly, Pulvermüller assumes that a sequence set is not necessarily a lexical item, but it may also be a set of abstract lexical categories, such as Noun, Verb etc. The link between a lexical item and a lexical category may be achieved by links connecting two neuronal sets, so that when one word-set α ignites, it not only primes another neuronal word-set β, but it also primes a lexical category neuronal set. Thus, the category of a nominative (or subject) noun *bear* in a sequence such as English *The bear attacked* would be represented by two sequence detectors. One would detect that *bear* follows a determiner, the other that *bear* is followed by a verb. In a similar way, a homonym such as *bear* (animal or verb) would be recognized by the sequence it is in and by its lexical category. "Essentially, for each lexical category label … a corresponding sequence detector can be postulated at the neuronal level" (p. 191). The sequence detector stays in a state of reverberation after it has been ignited, whereby it stores the sequence detector in active memory. In this way, discontinuous elements like *switch* and *off* in a structure like *She switched the light off* can still be connected together, provided there is no memory overload. Sequence detectors thus function like a kind of checking device, they force a choice which up to the checking moment had been left open.

A neuronal grammar model such as proposed by Pulvermüller works best with a bottom-up approach to grammar, i.e. with a usage-based model. A possible marriage with a Dependency- or Construction-type of grammar can therefore more easily be envisaged than with a generative model. A neuronal model, like a dependency grammar, offers a straightforward solution to discontinuous constituents, where the generative model has to

work with movement rules. Similarly, form and function are seen as linked and completely equal, and surface forms are emphasized. In contrast, the generative model ignores or subordinates function, while grammaticalization theory pays too little attention to form and especially to the more abstract, formal patterns (Holyoak and Thagard's 'mappings' or 'sets') in the grammar-system as a whole. In addition, dependency-type models and grammaticalization theory work with flat structures, i.e. the data as they appear on the surface, which goes well with a neuronal model, in contrast to generative models which work with rules that depend on deeper, highly abstract structures. Finally, in this neuronal grammar, not much is taken to be innate, which is in line with grammaticalization and dependency grammars but not with generative models.

Instead of innateness, Pulvermüller, stresses the role of frequency and associative learning. He notes (2002: 75) that "two connected neurons that frequently fire together increase the strength of their wiring" and that "any two cells or systems of cells that are repeatedly active at the same time will tend to become 'associated', so that activity in one facilitates activity in the other." On the connection between repetition and automation, Pulvermüller (p. 165) writes: "An important observation is that previously perceived syntactic structures are being imitated in subsequent verbal actions. The phenomenon attributed to a mechanism dubbed *syntactic priming* occurs with above-chance probability in both conversations and controlled experiments" (more on syntactic priming can be found in Tannen 1985, and Pickering and Branigan 1999). Another advantage a model such as Pulvermüller's is that its idea of mediated sequencing shows similarities to other cognitive systems. He observes (p. 160) that "[a]nalogous mechanisms of movement detection by mediated sequence processing were uncovered in the visual cortex of higher mammals …, and a related mechanism of sequence detection exists in the cerebellum …" (references omitted).

3.3 A sketch for an analogy-based learning mechanism for language

On the basis of Tomasello's three ontogenetic processes given in (4) above, linked with the importance of iconic/indexical thinking in language evolution and neuro-linguistic models as discussed in sections 3.1 and 3.2 respectively, I present a highly simplified sketch for language learning, in which the 'analogical grid' (the term used by Anttila (2003), to refer to the indexical/iconic mode of thinking – which he calls the woof and warp of the analogical grid), and hence the close link between form and function/meaning, plays a primary role. The same system would then also be at work in language change since I assume that the way in which language (and its underlying system, grammar) changes, is guided by the same learning mechanisms that help children to acquire language.[3] This does not mean that the sort of changes (or mistakes) that young children make in their language output must be the same as what is seen in language change. Obviously, changes which are made by adults are produced by a learning system (or already learned system) that operates on a far greater corpus of linguistic data than is the case for children. Similarly, the structural schemas (in neuronal terms, sequence-sets) used by adults will not yet all be fully developed in children. This means that the analogical sets on which the mechanisms work may change during the learning process; some of these indeed may become strengthened by frequent use or frequent firing (automation), and hence the learning mechanisms will produce different results.[4]

In my sketch of a usage/analogy-based grammar, I will only be concerned with semantics and morphosyntax, it will not include the comprehension and production of signs which begins to take place at an earlier stage of the acquisition period at the phonetic / phonological level (for an example of how this first stage may be analysed, see Peters 1985). Essentially, though, learning to differentiate between linguistic sounds and non-linguistic sounds, between sounds (allophones) and distinctive sounds (phonemes), and learning to

recognize and use the typical syllabic and intonational patterns of one's native language should be no different from the way differences and similarities between syntactic structures, and morphosyntactic and lexical categories are learned, except for the fact that the latter learning takes place on a concrete *and* on more abstract levels, and is, consequently, more complex (and indeed takes place later). I will also skip the stage where a combination of signs may still be processed holistically (on holistic processing, see Wray 1999, 2000, Wray and Perkins 2000). Even though holistic and compositional learning will probably go hand in hand, I will here simply describe what may take place on the basis of words (morphemes), once compositional processing begins. In all cases of lexical and morphosyntactic learning, it is assumed that form and function are connected.

The idea of a learning system based on analogical sets and indexical and iconic relations is taken from work on analogical sets in morphology (cf. Skousen 1989, Baayen 2003) and is also rather similar to the Operating Principles suggested for language acquisition by Peters (1985) and Slobin (1985a). This atomistic approach to language involves a continuous learning process rather than the use of a rule system; it is process-driven and invokes procedures rather than rules.[5] The advantage of postulating a rule system is of course that it minimizes the number of procedures and simplifies contextual specification. The disadvantage of a rule system, however, is, first of all, that it is not clear where the rules come from (unless one presupposes an innate rule system; for the problems connected with this, see e.g. Fischer 2004b), and, secondly, that next to the rule system, one needs a different type of lexical system to account for all the exceptions to the rules. In an analogically based system, there is only one system, grammar and lexicon are one. This is also the position taken by most grammaticalization linguists (I will come back to the importance of this (non-)distinction in section 4.1).

A putative disadvantage of an analogical system such as proposed here would be that one needs more fine-grained lexical categories (based on semantic and formal criteria) and more construction types or schemas. Pulvermüller (2002: 192-93), however, expects that the number of lexical categories would not exceed one hundred. In his proposal of a neuronal grammar, he reckons that a few millions connections linking input units would be necessary (starting from the assumption that about 100.000 input sets are needed for lexical items), and since "most cortical neurons have above 10^4 synapses,[6] the large number of connections should not constitute a problem" (p. 193). It is interesting in this connection to quote Baayen (2003: 230), who suggests that the logical-formal rule models of language (like the Chomskyan one) are a product of the fact that computers in the sixties did not have enough memory capacity, and so the linguists working with these models "elevat[ed] economy of storage to a central theorem".

Figure 3 makes the idea of an analogical learning system somewhat more concrete. It shows how one token, *apple*, is iconically related to a lexical set (a 'type') containing tokens of other kinds of fruit (*pear* etc.) and at the same time indexically related to other kinds of iconic sets containing tokens with which it collocates functionally and formally (*eat* etc., *red* etc.). [7] In terms of a neuronal grammar, these sets would be linked to the primary unit (*apple*) and to each other by so-called neuronal sequence sets, which are specialized in defining a sequence feature. Thus, "each lexical category label […] would be analogous to a sequence set" (Pulvermüller 2002: 191). This would ensure that a particular transitive verb (e.g. *grasp, tolerate*) is preceded by a noun which is [+animate] and [+agent] and followed by a noun which also obeys particular features. The relations between the tokens in Figure 3 are still on the concrete *token-level*, but the formation of a paradigmatic *set* of tokens in itself is already on the (semantic and formal) *type-level* (a set is indicated by its inclusion in square brackets). Thus, the set of *fruit* is already an abstraction, a type. Apart from that, the token *apple* is also

indexically (via its function) related to a set of lexical features (such as the feature-set given at the bottom-right in Figure 3), which will in turn, and eventually, help to define the more abstract formal type of the category NOUN (this is done via subsets of NOUN, such as COUNT NOUN, INANIMATE NOUN, ABSTRACT NOUN etc.). The set of lexical features itself is built upon the learner's experience of lots of other tokens with their contiguous tokens, and all these tokens together are in turn related to more abstract types. These abstract types give information about which categories typically follow or precede a Noun (or a Verb), or, at a higher level, which phrases typically follow or precede a Noun Phrase. All this has not been shown in Figure 3, which just indicates a first stage of (neural) connections (iconic and indexical) between one word token and other token-sets (represented by black arrows), and between these and other types (represented by dotted arrows).

[place Figure 3 about here]

The sets are all formed on the basis of functional as well as formal analogies, and the links between the first token and the sets are indexical as well as iconic. On a higher abstract level, the morphological types (representing categories such as Noun, Verb etc.) can then be further combined into syntactic types: NP type, VP type etc., and from there, again via frequent collocations of tokens with their sets attached, into larger structures (clause types). Structures or collocations, both at token-level and at type-level, that occur frequently may become automated because the sets, which also function at a neuronal level, are strengthened every time they are fired or used. This creates not only formulaic phrases on the concrete token-level (fixed collocations, idioms etc.), but also morphological and syntactic formulas on increasingly higher (abstract) type-levels, e.g. the typical feature-set of a Noun, the familiar

structure of NPs and VPs, and the familiar word orders that obtain within a particular language (e.g. the typical [NP_S VP NP_O] sequence of English declarative sentences).

In a frame like the above, analogy should be seen as both a *mechanism* and a *cause* (cf. also Itkonen 2005). By means of analogy we may change structures and the contents of paradigmatic sets, but it is also analogy that causes the learner to build up more abstract types or schemas. In other words in this learning model analogy is the primary force (and not reanalysis as argued in the grammaticalization model proposed by Hopper and Traugott 2003: 39, see also Campbell 2001b).[8] I believe that the looseness of analogy, which was seen as such a problem by many linguists in the recent past and therefore deemed unworkable (e.g., Kiparsky 1974 – but cf. Kiparsky forthcoming –, Lightfoot 1979, Harris and Campbell 1995: 51), will be much constrained if one thinks of analogy as taking place on different levels (i.e. on token and more abstract type-levels), and of tokens being ordered into sets. More precisely, the analogical possibilities are tightly constrained by both the token-sets, the lower level types (categories) and the higher level ones (syntactic constituents and constructions), and by the iconic and indexical connections between sets. In addition, the possibilities are also constrained by the fact that the sets are organized both semantically (functionally) and structurally since each sign or token (because of its binary nature) is part of a formal (structural) as well as a semantic set.

Thus, a change can take place first on a semantic-pragmatic token-level, which may cause this token to join another semantic set, after which it may also take over some of the formal characteristics of this set through the indexical link it has with a certain syntactic structure-type. This is probably how the so-called accusative and infinitive construction (Exceptional Case Marking construction in generative terms) spread in Middle English from verbs of physical perception (as in *I saw her* move) to those of mental perception (as in *I believe her to be a liar*) (cf. Fischer 1989: 160-61). This would be an example of a syntactic

change spreading via analogy. A change may also start on a formal token-level, e.g. a particular verb may be used as a noun, this would be an instance of conversion. When a change starts on a higher type-level, the effect of it will not be lexical but syntactic. For example, if the position of an object *vis-à-vis* a verb changes for perceptive or communicative reasons (salience, heaviness etc.), this might lead to a new structure-type, perhaps starting with certain objects which belong to one and the same token-set or type. Finally, this whole analogical process, in turn, is being further constrained by what Tomasello has called (see [4] above) entrenchment and competition.

In connection with the analogical model, I would like to note that some of the principles used in linguistic theory-building could well be accommodated within this model, such as the structure-preserving sequence of constituents defined by the X-bar principle, or the hierarchies of types defined by Government and C-command (cf. Chomsky 1981: 162 ff.). Similarly, the clines and hierarchies distinguished within grammaticalization, would also conform to lexical sets linked in order of abstraction. As heuristic devices, therefore, these principles are all valid and useful. And, indeed, they may be easier to work with for a researcher, because they supply handy terms to the different levels and hierarchies that have to be distinguished. However, the use of such rules or principles at the same time may obscure how the grammatical system really works (or how the learner really learns), because they begin to lead independent lives. They are no longer connected to the primary force of the analogical grid and hence cause the connection between grammar and the other (linguistic) domains to be moved out of sight.

An additional advantage of this analogical learning system is that there is only one system to begin with, i.e. a lexical one. There are no separate systems for the lexicon and the syntactic rule module, as in generative linguistics. It is therefore more parsimonious from an

evolutionary point of view, and it better fits the neurological findings reported on by e.g. Slobin (1997: 282), Goldberg (2001: 65), and Pulvermüller (2002: 116-17).

There is a similar advantage as far as language change is concerned: the same mechanisms are now available for morphosyntactic and lexical change. This links up with the views expressed by grammaticalization theorists, namely that grammaticalization and semantic change are intimately linked. If there are pathways of change to be found in grammaticalization, then one would expect similar ones to be found in semantic change. This is indeed the theme of Traugott and Dasher's (2002) study on semantic change, i.e. that semantic change shows regularities and direction, which in many ways are similar to grammaticalization.

4. Grammaticalization and analogy-based learning

We may now turn to the actual questions posed in section 1: how will all this help us to assess the workings of the parameters given in (2), to understand the different types of grammaticalization mentioned under (1), and the nature of grammaticalization itself?

4.1 Lexicalization and grammaticalization

I think first of all that this approach may clarify the difference and the similarity between the processes of lexicalization and grammaticalization (cf. [2ii]). Both concepts are concerned with similar processes except that lexicalization takes place strictly on a concrete token-level, while grammaticalization takes place on a combined token/type-level.[9] If grammaticalization affects (a) particular token(s) (as in the case of the development of the conjunction *þa hwile þe* > *while* in English), then it undergoes the same changes that a lexicalized compound or derivation may undergo, namely semantic and phonetic reduction (e.g. *foresail*: [f :rseil] > [f rsl], *waistcoat*: [weistkəut] > [wɛskət], OE *þa hwile þe* > ME *while*.

This unified way of looking at lexicalization and grammaticalization may offer a solution to such problematic cases of grammaticalization as found in the development of conjunctions like *since* and *while*, or the development of parentheticals such as *I guess/I think* (cf. Fischer 2007: 299ff.). Traugott and König (1991) (and cf. also Hopper and Traugott 2003: 81-84, 90-91) treat the development of *since/while* as a regular case of grammaticalization in spite of the fact that it does not show many of the usual (Lehmannian) characteristics. Haspelmath (1992: 343), indeed, wonders where the evidence is that the case of *while* has "anything to do with grammaticalization?". Since the change here takes place only on a token-level, it is indeed much closer to lexicalization than to grammaticalization. So this is different from the well-known case of the formation of Romance adverbs with *-mente*, where the change involves a token, the Latin ablative noun *mente*, as well as a type, namely the category Adjective (at first, of course, it only involves a subcategory of adjectives). The analogical model thus makes clear that lexicalization cannot easily be separated from grammaticalization; they take place on different levels, but the process is the same.[10]

Traugott and Dasher (2002: 84-85) write that of the six characteristics associated with grammaticalization, three are said to partly overlap with those of lexical-semantic change, while three others are said to be more typical only of grammaticalization (e.g. reanalysis and the fixing of a construction) but yet associated with the first three. It is true that there is overlap, but Traugott and Dasher's description does not really clarify the situation between grammaticalization on the one hand and lexicalization or lexical change on the other.[11] If, however, we distinguish between lexicalization and grammaticalization as taking place on different levels, as suggested here, the characteristics or mechanisms will be found to be the same for both, only the results may differ depending on what level the change takes place. Thus, what is called bleaching in grammaticalization, would be called narrowing in lexicalization. In both cases items lose part of their referential meaning but the effect of this

loss is different, depending on whether it happens on a type-level or a token-level. The resulting token in lexicalization or lexical change still has a specific reference as a lexical item, while the resulting type in grammaticalization becomes a prey to pragmatic inferencing.

Other lexical changes, in terms of metaphor and metonym, or amelioration and pejoration, would be explainable on the level of the token and the token-set; they would constitute a shift of a token to another lexical token-set as a result of the loss or addition of some lexical feature, which itself is caused by some indexical link. In a similar way, structural semantic change within a particular lexical field, would be related to what is already present within some token-set. If a new token joining a set is too much like an existing token in that set, and if the set itself is tightly structured, the older token may be pushed out of the set. This happened, for instance, in the English set of tokens for the four seasons (i.e. *lent* was pushed out by *spring*) and in the set of words referring to marriage (i.e. *to wed* was pushed out by *to marry*), as described by A. Fischer (1994, 1997). Such cases show that Lehmann's parameter involving 'loss of paradigmatic variability' (in Hopper [1991] this is called 'specialization') may also apply to lexical change (*pace* Hopper and Traugott 2003: 116) provided the semantic field in which the lexical item functions is tightly structured, i.e. not a very open class. This again shows that a strict division between the lexicon and the grammar, or between lexicalization and grammaticalization is hard to make or, in fact, should not be made.

I also note in this connection that reanalysis, which Traugott and Dasher hold as typical only for grammaticalization, is in fact *replacement* caused by analogy. E.g. the reanalysis of English [BE + *going*] + [*to*-infinitive] into [*gonna*] + [infinitive] was made possible by the fact that the language system already contained many Aux + Infinitive constructions; these formed the basis for the abduction or, rather, the replacement of the old structure by a new one (for details, see Fischer 2007). In the analogical learning model

analogy is primary, reanalysis is in fact an epiphenomenon when seen from the point of view of the speaker (cf. also Kiparsky forthcoming).

An objection that could be made against the idea of *while* as a case closer to lexicalization than to grammaticalization, is that it involves decategorization (from noun to conjunction), which is considered typical of grammaticalization and not involved in 'normal' cases of lexicalization or lexical change. Another objection that could be made is that the 'lexicalization' of a conjunction may also involve changes in syntactic structure. This is a valid objection, which will be addressed more fully in section 4.2.

As to decategorization, Traugott and Dasher (2002: 283) and Brinton and Traugott (2005: Ch. 4) are of the opinion that lexicalization only involves developments into or between major lexical categories (so they include cases of compounding (*cupboard*) and of what others have called *degrammaticalization*, as in *to down a beer*, where an adverb has become a verb), while functional categories must be the result of grammaticalization.[12] According to a more neutral interpretation of lexicalization, such as used by Keller (1998: 164ff., and cf. note 11), any item whose meaning can no longer be inferred causally or by association, i.e. has become purely symbolic, is a lexicalized item. According to this view, lexicalization simply means that that item has become part of the lexicon of a language (this also follows the definition given in the *OED*). The likelihood that lexicalization in this wider sense involves *de*categorization is of course much smaller since fewer items are needed at the grammatical end of the lexicon.

Brinton and Traugott (2005: 89-90) acknowledge this wider sense of lexicalization, which they describe as "institutionalized adoption into the lexicon". When the lexicon is seen as an "inventory" of all forms in a language, the definition of lexicalization based on it would then also include functional forms resulting from grammaticalization. They add, however, that such a broad interpretation "obscures the differences among types and functions of forms and

moreover *obscures the processes* by which they come to be structured within the inventory. To account for such differences it is necessary to distinguish between lexicalization in a more narrow sense and grammaticalization" (emphasis added). In their discussion, they *stipulate* what grammaticalization and lexicalization in the narrow sense entail: "The output of lexicalization is a 'lexical,' i.e., contentful item that is stored in the inventory and must be learned by speakers" (*ibid*. p. 96), while the output of grammaticalization is a "'grammatical,' i.e., functional form" (p. 99). Similarly, the input to lexicalization and grammaticalization both involve items from the inventory, but in lexicalization these "tend to be highly specified semantically" (p. 96), while in grammaticalization they "must be semantically general" (p. 99).

Even though Brinton and Traugott describe the processes that occur in lexicalization and grammaticalization as highly similar (they emphasize their 'parallelism' in their section 4.4), they still wish to maintain that the two processes are separate and need to be distinguished in terms of what they call 'minimal parallels' (i.e. 'differences'). In my view, however, the processes that occur *are* the same but the results differ depending on which *level* the process takes place: the level of the token, the type, or the token-type. Thus, one of Brinton and Traugott's 'minimal parallels', 'decategorialization', happens typically with changes on the more abstract token/type-level, while decategorialization is not involved in what they term lexicalization because this happens typically on the token-level. In addition, at a more abstract type-level, the difference involving decategorization is naturally bound up with Brinton and Traugott's other minimal parallels of 'bleaching' and 'subjectification', and greater 'frequency' and 'productivity' (all these serve to distinguish the process of grammaticalization from that of lexicalization). This is because abstract or general meanings are more easily prey to pragmatic inferencing, and because more abstract types are naturally more frequent than concrete tokens.

In other words these differences are all linked and depend on the basic type/token- or type-level that the process starts out from and not on any differences within the processes themselves. It must be clear that Brinton and Traugott's stipulation of what lexicalization and grammaticalization entail in the end does not really provide a clearer understanding of the differences between these two processes; in fact it obscures the fact that the processes taking place are to all intents and purposes the same.

The whole question of the difference between lexicalization and grammaticalization then becomes a terminological one; it depends on one's theoretical stance towards the distinction between lexical words and function words (see also note 1 above). If one believes that there is no clear-cut dividing line between functional and lexical categories, as most functional (including grammaticalization) linguists do, then it seems somewhat illogical to wish to make a strict distinction between lexicalization and grammaticalization.[13]

4.2 Clause combining or clause fusion

My next concern is grammaticalization type (iii) mentioned in (1), the issue of clause combining or clause fusion. In this type, not all of Lehmann's parameters seem to be at work.

The discussion of the clause-combining cline and the grammaticalization of clause linkers in Hopper and Traugott (2003: 176ff.) strongly suggests that the most integrated clause types are historically later. They provide examples from the history of English, Akkadian and Hittite of finite complements and relative clauses "show[ing] a clear continuum from looser to tighter syntactic structuring" (p. 194). They conclude that "[t]here is substantial evidence that in most languages and most instances there is a continuum of development from less to more unified clause combining" (p. 209), "from less to more bonded" (p. 211).

The general idea that a non-finite complement originates from a biclausal structure is also clearly advocated in Givón (1979: 214), who writes: "The complement verb in many

languages is non-finite, as in English, and this [i.e. the development from a subordinate finite clause into an embedded non-finite one] involves a marked reduction in the tense-aspect morphology, lack of subject agreement, and often some special infinitival-nominal morphology". He further states that "the possibility is still open that *all* equi-NP verb complements in language arose via such a process [i.e. from a loose, paratactic concatenation via syntacticization into non-finite embedding]".

It seems to me that the unidirectionality of the clause-fusion cline is a 'principle' that we have to handle with great care, and we need clear empirical evidence in each presumed case of clause fusion to show that reduction has indeed taken place. In fact, Lehmann's (1988) study on clause linkage makes clear that the continuum of clause linkage may go both ways, towards reduction as well as elaboration. A good example of elaboration is discussed by Lambrecht (1988) concerning a change that has taken place in spoken French (and to some extent also in other Romance languages), whereby the original main clause, with a typical SVO structure, as in (5), has been replaced by a cleft (i.e. a biclausal structure) sentence, as in (6): [14]

(5) *Les yeux me font mal*

The eyes me cause pain

(6) *J'ai les yeux qui m' font mal*

I have the eyes that me cause pain

'My eyes hurt' (cf. Lambrecht 1988: 137)

A linguist with no knowledge of the history of French, and armed with a unidirectional principle of clause combining, might easily conclude that (6) must be an older stage than (5), because (5) shows 'reduction'.

Similarly, when we look at the behaviour of another group of complement-taking verbs in the earliest stages of the English language, i.e. the verbs of persuading and urging, we find that they occur both with a *þæt*-clause and a *to*-infinitive, as shown with the verb *nydan* 'urge, compell' in (7a) and (b) respectively (cf. Los 2005: Ch. 8). It is unlikely, however, that the *to*-infinitive is a stage on the path away from the *þæt*-clause, i.e. that it shows clause reduction. Rather, as argued by Los (2005: 45-46), the *to*-infinitive is a development from a purposive *to*-PP consisting of a verbal noun, as illustrated in (7c). (7a) and (b) are examples of a *þæt*-clause and *to*-infinitive respectively.

(7) a. *Þær hy mon* ***nydde þæt*** *hy deofulgyld*[ACC SG/PL] *weorðedon.*
(Mart 5 (Kotzor)Oc 8, A.5, cf. Los 2005: 200)
there them 'one' forced that they devil-worship worshipped
'there they were forced to worship idols'

b. *Þone* ***nydde*** *Decius se kasere deofolgeld*[ACC SG/PL] ***to*** *begangenne*[INF]
(Mart 5 (Kotzor)Se 14, A.2, cf. Los 2005: 200)
Him forced Decius the emperor devil-worship to practice
'The emperor Decius forced him to practice idolatry'

c. *Þa yrsode se dema … ond hine þa* ***nydde to deofolgylde***[GEN PL] ***begonge***[DAT]. (Mart 5 (Kotzor)Ap28,A.6, cf. Los 2005: 200)
Then raged the ruler … and him then forced to of-idols practice
'Then the ruler became angry and forced him to the practice of idols'

Los makes clear that the *to*-infinitive came to be used more and more as a replacement of both the verbal noun PP and the *þæt*-clause because it had a number of advantages over the other two constructions. Unlike the verbal noun, the infinitive was not constrained by the "random workings of derivational processes" (Los 2005: 201) so that any verb could be selected in the

to-infinitival structure. In the *þæt*-clause, tense and agreement were expressed lexically, but this did not give it an advantage over the *to*-infinitive in that both tense and agreement were fully controlled by the tense features and the matrix object of the main clause. It became thus more economical to use a *to*-infinitive once this infinitive had acquired verbal features. Moreover, the mood of the complement clause after these verbs was often in the subjunctive, and the sense of potentiality/uncertainty that it conveyed could be carried as well by the future-oriented (purposive) *to*-infinitive.[15]

We would have to conclude then, taking these details of the overall grammatical synchronic system into account (and not just the construction under discussion), that there was no straight, unidirectional pathway from *þæt*-clause to *to*-infinitive. The *to*-infinitive became an option under rather precise conditions, one of which was the replacement of the more awkward *to*-PP. The similarity of the *to*-PP and the *to*-infinitive (which was originally an action noun in the dative) makes it highly likely that analogy played the important role in this replacement. It is clear that there has not been a reanalysis in the form of the construction or a 'reduction'.

There is perhaps more evidence for a grammaticalization path in the development of *that*-complements, from independent clauses into hypotactic ones, a case discussed by Hopper and Traugott (2003: 190-94) for Old English. They argue that the older constructions are of the type illustrated in (8), and that a new complex clause type (9) developed from there:

(8) *Ða on morgenne gehierdun* ***þæt*** *þæs cyninges þegnas þe him beæftan wærun*
then in morning heard that of-the king thanes who him behind were
þæt *se cyning ofslægen wæs*[INDIC], *þa ridon hie þider.* (ChronA(Plummer)755.23)
that the king slain was, then rode they thither
'Then/when in the morning the king's thanes who had been left behind heard (that) that the king had been killed, then they rode up there'

(9) … *þohte gif he hi ealle ofsloge*[SUBJ] ***þæt*** *se an ne ætburste*[SUBJ] *þe he sohte.*

… thought if he them all slew that that one not escape whom he sought

(ÆCHom I 5 219.72)

'… thought that if he slew them all, the one he sought would not escape'

Evidence for this development they see in the fact that in (8) a demonstrative pronoun *þæt* is still present in the main clause with the result that the complement, also introduced by *þæt*, is not (yet) embedded into the main clause. This 'extra' pronoun is absent in (9). Further evidence for clause fusion, is found in the fact that the complement clause in (9) has a subjunctive verb, *ofsloge*, which is a mood typical of subordinate clauses, while the equivalent clause in (8) has an indicative verb, *wæs*.

Neat as this may look at first sight, a number of questions need to be raised in connection with the presumed development. First of all, no quantitative evidence is provided that the 'double *þæt*' construction (8) occurs more frequently in earlier than in late Old English. Secondly, it is quite possible that the 'extra' *þæt* in (8) is used in this particular example for processing reasons, since there is quite a gap between the matrix verb *gehierdun* and the complement clause. Thirdly, the use of the subjunctive in (9) is in itself not very telling: after a subjective verb like *þohte* 'thought' (expressing uncertainty), a subjunctive is more likely to occur than after a more factual verb like *gehierdon* 'heard' used in (8). Fourthly, the possibility is not discussed that the different structures of (8) and (9) may be due to differences between the spoken and the written mode (Givón's (1979) 'pragmatic' and 'syntactic modes') rather than to a chronological development. Philologists have shown that (8) occurs in a text that goes back to an oral story. Other oral features in this text, such as the confusing use of the pronoun *hie* 'they' to refer to three different groups of people in the story, indeed speak for an oral source.[16] Moreover, the use of an extra (pleonastic) pronoun *it*

or *that* still occasionally occurs in *spoken* English today as the instances in (10) from the spoken part of the ICE-GB corpus show:

(10) a. *I felt the need to to express* ***that*** *<,>* ***that*** *I was concerned*

(ICE-GB s1a-060-165)

b. *… if you got* ***that*** *accepted* ***that*** *that pavilion was sacrosanct to the men*

(ICE-GB s1b-021-039)

c. *and I repeat* ***it that*** *I believe it starts in a conscious way*

(ICE-GB s1b-070-146)

Through the focus on a grammaticalization path, other possible causal factors having to do with the (synchronic) grammatical system in which these constructions functioned seem to have been neglected. What needs to be investigated, for instance, is the possibility that a double *that* may have come to be avoided in Modern English as a result of the word order change from SOV > SVO, which took place in the Middle English period. In the new surface SVO orders, the demonstrative pronoun *that*, as the object of the main verb, would normally appear right in front of the *that*-complement, as in (10a). This not only produces an awkward echo,[17] it also renders the use of *that* unnecessary in terms of processing ease since the complement now immediately follows. It is noteworthy in this respect, that a double use of 'that' (or 'it' + 'that') is much more natural in spoken Modern Dutch and German, where the two 'that's do not as a rule occur together in sequence, as (11) shows: [18]

(11) *Ik heb* ***dat/'t*** *steeds. gezegd* ***dat*** *ik dat nog doen moet*

Ich habe ***das*** *immer gesagt* ***daß*** *ich das noch tun muß*

I have ***that/it*** always said ***that*** I that still do must

'I have always said that I must still do that'

One of the problems concerning the 'pathway' Hopper and Traugott accept with reference to (8)-(9), is that this grammaticalization only concerns a reduction in clause structure. Since it involves an abstract type (a rule, schema or superset; i.e. what Himmelmann 2004 has termed 'broad grammaticalization', see note 9 above) and not a token or token-type (the 'core' verb may be different each time), the usual grammaticalization reduction features, such as semantic bleaching, phonetic reduction, decategorization, scope decrease etc. are difficult to discern in this process. Even though most functional linguists accept that a construction type has some semantic content (cf. Langacker 1987, 1995, Croft 1991, Tomasello 2003b), it would still be a content of a rather general nature and therefore difficult to 'reduce' except by some form of ellipsis.

Similarly, it is difficult to see how there is a change in scope. Hopper and Traugott (2003: 185) seem to suggest that there is an *in*crease in scope, contra the usual unidirectional cline leading to scope decrease (cf. Table 1). They write: "typical of hypotactic developments … is the recruitment to connective function of deictics and other demonstratives. The motivation here is the *extension* of deictic reference from entities referred to in the non-linguistic world to anaphors and cataphors of NPs and then to anaphors or cataphors of *propositions* (clauses)" (emphasis added). This suggests that they recognize an "extension" in scope ("reference") concerning the element *þæt* from single "NPs" to "propositions" when it becomes a "connective". It seems to me that the use of a demonstrative pronoun like *þæt* in (8) could always refer to an object or a situation in the non-linguistic world, and hence also to a proposition (an idea-unit) as well as an NP, so that the change from (8) to (9) cannot really be seen as an increase in scope. The extent of the scope, in other words, depends on the context.

It could be argued that the clause linker, *þæt*, itself grammaticalizes from a demonstrative pronoun to a phonetically reduced connective (or complementizer), bleached of its deictic sense. Two comments may be made here. First, it is quite possible that both *þæt*s were already reduced in this construction (both elements are reduced in Modern German and Dutch in [11]), and that quite simply one of them was dropped. Secondly, it is also possible that the second *þæt* in (8) never was a true demonstrative. It may have been a correlative echo of the first *þæt* to indicate a link; not a full constituent, in other words, but a (deictic) device to monitor the flow of speech.

If we grant that the reduction of *þæt* may not be so relevant in this particular case, then the grammaticalization involves mainly the integration of the second clause unit into the first one. What change does that involve? Does it involve changes typical for grammaticalization, as distinguished in Table 1? It could be argued that in our Old English case, it involves a change in word order, i.e. the new 'complement' acquires the word order typical of subordinate clauses. But, if there was a word order change, the question arises whether it was directly linked to the grammaticalization. Hopper and Traugott (2003: 191) note that in the early example (8) with double *þæt* the word order was already "something more than merely paratactic". They imply that the word order change is part of the grammaticalization process but that the earlier stage with the still paratactic order has been lost to us.

There is no space to go into more detail here but I would like to draw attention to the fact that it would be very hard to prove a link between word order and the development of a conjunction or complementizer in Old English, and presumably also in many other older language phases in which word order was pragmatic rather than strictly syntactic. For instance when we look once again at developments in what becomes the conjunction *while*, we see that the older phrase *þa hwile þe* (where *hwile* is still quite clearly a feminine noun used in the accusative) occurs with both SOV(V) and SVO(V) orders in Old English, characteristic

respectively of subordinate and main-clause order. Out of a total of 390 occurrences in the Dictionary of Old English Corpus, about half have no second Verb or Object and therefore cannot be used to distinguish between the two orders; of the other half, at least 52 examples show the order most typical for main clauses (and these are not restricted to a particular period). When we look at more reduced and/or possibly later forms of the conjunction, such as *þe hwile þe, þe hwile þæt, þa hwile, þa wile þe, wile þe* and *wile* by itself, the picture does not become any clearer. Again both SOV(V) and SVO(V) are found, but in truly late texts the SVO(V) order might as easily point to a new subordinate order (in the general change the language undergoes towards fixed SVO order) rather than to an older main clause order. On top of that, the word orders in main and subordinate clauses were not fixed to the above patterns, as they are, for instance, in Modern Dutch and German, so a word order different from the 'norm' may always have been possible for stylistic or discourse reasons. The problem can be illustrated with two examples taken from Hopper and Traugott (2003: 90-91):[19]

(12) a. *& wicode þær* ***þa hwile***[ACC] ***þe*** *man þa burg worhte & getimbrede …*

(ChronA(Plummer)913.3)

and camped there that time that 'one' that fortress built and erected

'and camped there during the time that the fortress was built and erected'

b. *& ðæt lastede þa* xix *wintre* ***wile*** *Stephne was king*

(ChronE(Plummer)1137.36)

and that lasted those 19 winters while Stephen was king

'and that went on for nineteen years while Stephen was king'

In the older, tenth-century example, (12a), the word order of the clause introduced by the older form *þa hwile þe* is SOV (*man þa burg worhte*), i.e. the word order which is typical for a

subordinate clause, while in the more recent, twelfth-century example, (12b), with the newer linker *wile,* the word order is typical of that of a main clause (subordinate order would have been *Stephne king was*), although in this later example it may also represent a new subordinate order.[20] These two examples therefore show, if they indeed show anything at all, that the older form of the 'conjunction' co-occurs with a subordinate order, which instead of being an early order, is in fact a later one.

It is difficult to prove therefore that the change in word order and in the clause linker is part of a unified clause-combining grammaticalization process. My hypothesis in this case would be as follows (but clearly more research is necessary): we are dealing with two separate changes here, a word order change and a change in the clause linker. If the two changes are indeed not or only very loosely connected, it would strengthen my suggestion that the development in the conjunction *while* is closer to lexicalization than to grammaticalizatio

There are similar problems concerning other cases of clause combining. Relative clauses are often quoted as a well-known case of parataxis developing into subordination. Hopper and Traugott (2003: §7.4.3) discuss cases from English and Hittite. However, Deutscher (2001) has shown that in the development of relative clauses in Akkadian (an ancient Babylonian language), there was no paratactic situation to start with; rather, the later relative clauses were in the earliest stages introduced by a pronoun which agreed with the head noun in the main clause, with the clause itself functioning as an apposition. He also indicates that such an appositional source may have been quite common in other languages, referring to developments in Semitic, Germanic, and Greek and Latin. What we have here, in other words, may be another case of clause elaboration rather than clause fusion.

Another problem with the grammaticalization type involving clause structures (which are highly abstract) rather than constructions with a number of fixed lexical tokens, is that it is often difficult to know whether the various types are indeed stages in one and the same

process of grammaticalization, because most of Lehmann's parameters cannot be applied to abstract structures. Hopper and Traugott (2003: 125) discuss relative clauses in Estonian, which are said to be 'layered',[21] where one type has a finite verb and a relative pronoun, while the other has a participial verb and no pronoun. It is unclear, however, how the two types are diachronically related. They look rather similar to two construction types in English, i.e. (i) *He watched a man, who was going across the yard,* and (ii) *He watched a man going across the yard.* Here again it is quite possible that the participial construction was older (which again would make it a case of clause elaboration rather than fusion), but it is equally possible that the two types derive from two different sources and that a clause elaboration of (i) took place on analogy of an already existent type (ii). Only detailed study, provided there is enough historical data going back far enough in time, can settle the question.

4.3 Subjectification

Finally, I will have a closer look at a well-known case of subjectification (type [iv] under [1]), i.e. the development of dynamic/deontic modals into epistemic ones in English. The question I would like to raise is, in how far does this case present scope increase, as suggested by Tabor and Traugott (1998), rather than decrease, as it should according to Lehmann's parameters? In addition, I will again consider the role played by analogy in this case.

Tabor and Traugott (1998: 233ff.) suggest that there is a difference in scope between epistemic constructions such as present-day English *He must be home by now*/ *She may be right*, where the epistemic modal has scope over the whole of the proposition (given in italics in the gloss) and can be paraphrased as 'It is necessarily the case *that he is home by now*'/ 'It is possibly the case *that she is right*', and dynamic/deontic modal constructions, such as *I must do this first/ I can drive a combine*, where the scope of *must/can* is restricted to the VP.[22] The question I want to raise is: How did this change take place formally? Is it simply a matter

of the form *must* etc. changing in meaning/function, or is more involved? To put it differently, is there only a token involved, i.e. *must*, or also a type, e.g. the formal category to which *must* belongs, or a larger syntactic construction-type in which *must* functions as a token?

Must belongs to the category of modal auxiliaries in present-day English, and it seems clear that the epistemic development is typical for all core modals. The change obviously involves a category and therefore a more abstract type. In other words, this grammaticalization would be a true case of grammaticalization and cannot be interpreted as lexicalization (or a mere lexical change), as in the case of *while*, where I have argued that *only* a token is involved. The other concern, whether the modal that becomes epistemic forms part of a larger construction, is a trickier one. On the surface, there doesn't seem to be much formal difference between epistemic and dynamic/deontic modal usage, after all *He must be at home* can have either meaning in the appropriate context. We will therefore have to look more closely at the historical development of the epistemic modal.

As Denison (1990) and Warner (1990, 1993) have shown, the only more or less clear epistemic examples in Old English from a formal point of view involve 'subjectless' types, i.e. instances where the modal verb appears without a subject of its own, which makes a dynamic/deontic reading difficult. There are three types, represented by the examples in (13)-(15) respectively. First, there are instances like (13) without any subject; these are rare.[23] Second, we frequently find modals combined with an impersonal verb, which seem to have a 'raised subject' (i.e. the dative/accusative experiencer functioning as a 'subject'),[24] as in (14). The third type, (15), is also fairly frequent and concerns a construction in which the modal is combined with an intransitive infinitive, which does not assign a thematic role to its subject, such as copula verbs: *beon* 'be', *gewurþan* 'become, get, happen' etc. Often an expletive subject *hit* 'it' is present. These verbs are close to impersonal verbs like *gelimpan* 'happen',

which may also occur with expletive *hit.* It is important to note that in these constructions the copula verb is followed by a complement, which is very often a *þæt*-clause.

(13) *Eaðe **mæg**, þæt me Drihten þurh his geearnung miltsigan wille*

(Bede 3 11.192.5)

Easily can that me Lord through his merit show-mercy will

'It may be that the Lord will show me mercy because of his merit'

(14) a. *þonne **mæg hine scamigan** þære brædinge his hlisan* (Bo 19.46.5)

then can him shame of-the spreading of-his fame

'then he may be ashamed of the extent of his fame

b. *Hwy ne **sceolde me***[DAT] *swa **þyncan***? (Bo 38.119.9)

Why not should me so seem

'Why should/How could it not seem so to me?'

(15) a. *Ðeah þe **hit swa beon mihte þæt** he þas blisse begitan mihte*

(ÆLS (Ash Wed)106)

Though it so be could that he those favours beget could

'Though it could be the case that he would receive those favours'

b. *Eaðe **mæg gewurðan þæt** þu wite þæt ic nat* (ApT 21.10)

Easily may happen that you know that I not-know

'It may easily be the case that you know what I don't know

c. *Gif hit swa **sceal gewurðan** þæt mann us her finde and mann us for Godes naman to ðam casere læde* (LS 34 (SevenSleepers)415)

If it so must happen that 'one' us here find and 'one' us for God's name to the emperor lead

'If it must so happen that they find us here and lead us to the emperor because of God's name'

We can draw a number of conclusions from these examples. I need to mention first, however, that in accordance with my proposal for a usage/analogy-based grammar in section 3, I construe the Old English modal verbs as main verbs in monoclausal structures, so not as functioning in a biclausal Control or Verb-raising structure (as is done in most generative accounts, e.g. Lightfoot 1979, van Kemenade 1992, and Roberts 1993; see also note 31). I argue in Fischer (2007) that the modals in Old English are best analysed as governing the bare infinitive directly, as an object.[25]

The conclusions we can draw from the examples in (13)-(15) are these: (i) First of all, Old English modal verbs seem to be similar to impersonal verbs (cf. Denison 1990). Like some other impersonal verbs in Old English they occur both 'personally', i.e. with animate and inanimate agentive subjects (when they are dynamic/deontic), and 'impersonally', i.e. without a subject when they are epistemic, as in (13) and (15b) (cf. Fischer and van der Leek 1983).[26] When the modal verb is used impersonally, without a nominative, that is without an agentive-like NP, the semantic meaning of the verb becomes more general. Thus, *mæg* would then mean 'power exists', *sceal* 'obligation exists', *mot* 'opportunity exists' etc., which would make the meaning of these verbs more dependent on the context and on general experience, i.e. their full meaning in the clause is established by pragmatic or logical inference: they thus convey general possibility, necessity etc.

(ii) It is not surprising to find these impersonal, non-agentive modals in combination with impersonal infinitives (as in [14]), which likewise can occur without a nominative or agent-like subject. These constructions are similar in structure to the ones containing a deontic/dynamic modal plus infinitive, in that in both cases there is just one case-form (nominative or dative/accusative), and this case-form plays the same thematic role with respect to the matrix verb and the infinitive. So *He can read* and *Him can shame* are exactly the same in structure except that the nominative case-form functions as an 'agentive'-like

thematic role for both *can* and *read*, while the dative/accusative form functions in an experiencer-role for both *can* and *shame*). Denison (1993: 238ff.) and Warner (1993: 129) suggest that the process in (14) is similar to Subject-raising, but this is not quite felicitous according to the generative definition of Subject-raising. According to this definition, the subject of the infinitival verb (which receives its semantic role from this infinitive) *must* be raised in order to get case, and the subject position of the matrix verb (which gives no semantic role to its subject) *must* be filled structurally. There was no need for this Raising, however, in Old English because it still allowed subjectless sentences. Regular cases of what is called Subject-raising, e.g. with *seem, happen, chance*, only occur from late Middle English onwards, when the language no longer allowed an empty subject position but required an obligatory subject. In Middle English the subject became more purely structural (i.e. it could express a larger variety of semantic roles[27]) due to the loss of inflexional case. I will therefore call the construction illustrated in (14) a case of 'pseudo-raising' for lack of a better term. In fact, if anything, the construction is more like that of control verbs, except that the infinitive is not clausal (there is no PRO), as I have argued for all the modals.

(iii) Even though the examples in (14) do not present proper Raising in generative terms, the exceptional use of this 'pseudo-raising' with impersonal infinitives only, does provide us with indirect evidence that agentive infinitival subjects of 'personal verbs' could not yet be 'pseudo-raised'. What I mean is that verbs with an 'agentive' subject role, like *come,* could not be combined with an impersonally used (i.e. epistemic) modal verb that did not have an agentive subject role. In other words, epistemic modals with personal subjects, of the type *He must come soon, no doubt about it*, could not yet occur in Old English because in this case the modal and the infinitive had different thematic 'subject' roles, expressed by different inflexions. Again it is not surprising to find that clear evidence for an epistemic modal with a personal subject only becomes available in Middle English, at the same time as

so-called Subject-raising structures with verbs like *seem* begin to occur. To this group of impersonal verbs, I also link copula verbs like *be*, *become*, which likewise do not assign agentive subject roles. This accounts for the occurrence of epistemic modals in (15), where the modal verb is combined with the copulas *beon* and *gewurðan/geweorþan*

(iv) What I find most interesting about the examples in (15) is that the impersonal modal verb, followed by an agentless infinitive, occurs with a *þæt*-clause which depends on the infinitive (note that a *þæt*-clause is also present in the rare case of (13) but without an infinitive). Here we have explicit evidence for a biclausal structure, which cannot be attested for deontic/dynamic modals. I checked all the modals in Old English (in the parsed YCOE Corpus, and more superficially in the Dictionary of Old English Corpus) but found no examples of a modal verb immediately followed by a *þæt*-clause except with the marginal modal *willan*. This verb is a marginal modal because it was not a present-preterite verb like the others, it was never used impersonally, and it was more clearly a full verb – used interchangeably with the regular full verb *willian* 'wish, desire' (for more details see Fischer 2007). So I found no examples of *I can, I may, I shall* etc. + *þæt*-clause. Biclausal constructions of the type illustrated in (15), however, are frequent in Old English, especially with *magan.* They suggest that this was the only way to express epistemicity if the infinitival object/complement of the epistemic modal was not itself an agentless or impersonal verb. One could say that the structure shown in (15) performed a kind of 'bridge' function. The modal (including the impersonally used modal) could not be combined with a *þæt*-clause ([13], as I said is rare). The solution, therefore, was to combine the modal with an impersonal infinitive or copula, which could take a *þæt*-clause.

Returning now to the problem of scope increase in the subjectification of the modals noted by Tabor and Traugott (1998), I propose, on the strength of the considerations I have enumerated in (i) to (iv), that epistemic usage in combination with personal, agentive verbs

arose later, in Middle English, via an earlier biclausal structure consisting of an impersonal modal verb followed by an agentless infinitive/copula + *þæt*-clause, i.e. the type illustrated in (15). The reason that the epistemic modals become difficult to distinguish in late Middle English from the other deontic/dynamic uses, is because they begin to occur in the same clause-structures. This was due to a number of related factors, having to do with changes in the grammatical system of Middle English. These factors are: (a) the rise of structural subjects; (b) the loss of impersonal verb constructions; (c) the emergence of so-called subject-raising constructions with verbs like *seem, happen*. Due to these three changes, the construction of (15), which was similar to the 'non-raised' *seem*-construction, by analogy also began to allow 'raising', so that *It may be that he comes* began to be replaced by *He may come*. The analogy was made possible by the fact that in dynamic/deontic use the construction with a 'personal' or 'agentive-like' subject was already very frequent. As Plank (1985) has argued, it is natural for marked constructions to be structured as much as possible analogous to unmarked ones. Since epistemic and deontic/dynamic modality is expressed by the same verbs, and since deontic modals themselves can be subjectively deontic (cf. note 22), it is not surprising for the epistemically used modals to conform to (or rather to be replaced by) the structure used for the deontic/dynamic ones due to the rise of a structural subject. This development also falls in with the 'Minimize Form' principle formulated by Hawkins (2004).

If we accept this development for the epistemic modals, we would also have an explanation for the problem of scope (if indeed we wish to treat this case as an instance of grammaticalization[28]) because the scenario I have sketched here brings the epistemic development in line with the generally accepted behaviour of scope in grammaticalization processes. My proposal shows that the epistemic modal was at first in a higher clause than the proposition which depended on it (i.e. the *þæt*-clause) unlike the dynamic/deontic modal which was in the same clause as its infinitival object/complement. This naturally entailed that

the epistemic modal had a larger scope since it headed the actual proposition. In other words the scope possibilities of the modal verb were formally the same, whether it had epistemic or dynamic/deontic sense. They both governed an infinitive, but it was only in structures like (15) that the infinitival object of the modal verb included a *þæt*-clause, which contained the actual proposition. The scope concerns in both cases the immediate constituent of the modal verb. In Middle English, the epistemic structure of (15) begins to be replaced by the 'raised' construction, which had the same form as the already existing dynamic/deontic structure. In this 'raised' construction, the modal has become a part of the proposition that it first had scope over in the form of the *þæt*-clause. In other words, this formal replacement takes place with the semantics and the scope of the full biclausal *þæt*-clause structure preserved. Because there was a biclausal intermediate stage that made this development possible, one cannot maintain that this change from deontic/dynamic to epistemic involves scope increase. It does, ultimately, but not by a *direct* route. The unidirectional parameter of scope could therefore be maintained in this particular case (if we wish to consider it a case of grammaticalization) in the sense that there was neither increase nor decrease.

It remains to be seen whether this solution is also possible for other cases of scope increase that Tabor and Traugott (1998) have suggested,[29] and whether the modals in other languages have followed a similar formal path. This question will have to be answered by future research. There is some additional evidence, however, that the modal becomes epistemic only via a more elaborate construction type. A perusal of actual data from the ICE-GB corpus shows that in actual language use most epistemic constructions concern a modal followed by the infinitive *be* (whether as a copula, or an auxiliary of the progressive /passive/ perfect [perfect *have* is also frequent][30]). An epistemic modal followed by a personal agentive verb (as in *He may come in late*) is rare in the corpus. In other words, an intransitive 'impersonal' infinitive is still usually present. Note that a sentence like *You must be lying/ You*

must have lied is easily interpreted as epistemic, whereas *You must lie* without *be* sounds strange, and is indeed more easily interpreted as deontic even though this is an odd command (it could be said to a spy who must lie for his country). Epistemic usage of a modal + *be* followed by a *that*-clause is also still common, as in *It may be (the case) that ….*

Another interesting piece of evidence is the different forms used in some English-based creoles for deontic and epistemic *may* and *must.* Edhard (2004) shows this for the Suriname creole Sranan. She has found unequivocal epistemic uses of both *can* and *must* only in twentieth-century documents, but in both cases the forms used are part of a larger construction (for more details and similar findings see also Winford 2000),

(16) a. *a **kan de** fanowdu fu tan wakti* (*Waktitoren*, Edhard 2004: 45)
it can be necessary to stay wait
'it may be necessary to keep waiting'

b. *a **musu de taki** a sondu nanga a sari di den ben kon de na ini …*
(*Waktitoren*, Edhard 2004: 50)
it must be that the sin and the sad that they been come be at in
'it must be that the sin and sorrow that they had gotten into …

Finally, the occurrence of epistemic adverbs such as *maybe* and *peut-être*, shows that these too arose in combination with *be.* This latter fact may also show that the scope increase which has been noted for sentence adverbs and pragmatic markers (cf. Tabor and Traugott 1998), may have developed via a similar route, i.e. via an earlier biclausal structure (for details, see Fischer 2007).

5. Concluding remarks

To achieve a clearer understanding of what grammaticalization involves, and in general to achieve a better understanding of what happens in language change, I believe that it helps to work with a usage-based, analogical grammar of the type I have proposed here. That is, a grammar that is concerned with language as a process (rather than a product); a grammar that works with surface forms and derives abstractions from the surface forms only; a grammar that takes form and function equally seriously because indivisible, and a grammar that can at some point be linked up with neural mechanisms, language learning and the evolution of language. When we establish what takes place in processes termed grammaticalization with the help of such a grammar, distinguishing between what happens on a type-, type/token- as well as a token-level and taking into account what kinds of analogical extension are possible within each particular synchronic system of grammar as a whole, it seems possible to achieve a better understanding of what happens in the different types of grammaticalization discussed here.

I have argued that it may clarify the relation between grammaticalization and lexicalization. It has also been shown that the issue of scope increase (rather than the expected scope decrease) noted by Tabor and Traugott (1998) among others, may be less of a problem in that at least in some accepted cases of grammaticalization, the increase in scope may not have developed by a direct route. In this sense, Lehmann's parameters may to some extent be vindicated as useful heuristic devices to discover cases of grammaticalization. In addition, it has been made clear that his parameters work best on a fairly low, concrete, level, i.e. when type as well as token is involved. Thus the grammaticalization of clause types and the fixation of word order (i.e. those distinguished under [1i] and [1iii]), which takes place on the most abstract type-level, also shows the least influence of the parameters: phonetic reduction is impossible in an abstract schema; similarly, there is very little semantic reduction (if any),[31] there is no change in scope, and no fusion of elements.

Finally, but perhaps most importantly, the whole notion of grammaticalization as an independent mechanism of change has been called into question. It has been suggested here that the shifts or stages in a grammaticalization process may perhaps more easily be explained by the workings of analogy (i.e. the 'analogical grid', which contains indexical as well as iconic relations[32]) and frequency (in relation to economy). Analogy is seen as a cause as well as a mechanism. The process of analogy involves form as well as meaning, which are seen as indivisible in any linguistic sign. The analogical process, furthermore, can only be explained from the forms and the meanings that analogous structures have for speakers within their synchronic system of grammar and within their communicative situation. It has been argued here that analogy itself together with frequency helps build up this system.

I have tried to show that analogy is a strong motivating force in grammaticalization, as it is in language change and language learning. The important role of analogy is also clear when we view it against the background of language evolution and general cognitive principles. Analogy does not only work in language but in all areas of science, culture and life (cf. Gentner *et al.* 2001, Shelley 2003). Even though I have shown that analogy can be constrained, that it is not the loose concept which led to its being dismissed as a useful principle by formal linguists in the nineteen seventies, it is hardly possible to use analogy as a predictive principle in a theory of language change. This is because analogical thinking ultimately is based on the experience and creativity of the individual speaker. It is only when an analogy is fairly obvious and straightforward that it may be accepted by many individuals and cause a change rather than some individual innovation. Hofstadter (1995: 201) describes analogies as "substitution errors", "conceptual mismatches", which are always *context-dependent*. He adds that we are "congenitally constructed" to make these mistakes because it is "good for us, evolutionarily speaking". Without them language would become too complex;

we need them, in other words, to keep the system simple and running (this is also the argument put forward in Hawkins 2004).

The fact that a grammaticalization process so often follows a similar path, and that cases of degrammaticalization are somewhat rare, maybe partly the result, as Lass (2000: 221) has suggested, of "positive feedback or autocatalysis", which characterizes "all kinds of processes in the world". Aitchison (1987: 19) argues that it is probably the result of certain choices being made at each stage of the process. She describes this process of choice in her comparison of language change to a computer 'lifegame':

> At every stage, any language has a set of options which it can take, which in turn affect its future options. The choice of a particular option may be triggered by social factors (causation level one), but the social factors simply pointed the language down one or another of an existing set of options, which were predetermined by its existing structure (causation level two). In certain cases, the structural pressures would be so strong that the social trigger simply nudged the language along a preordained path, at other times genuine options could exist. The existing structure and the responses to options are overall governed by certain relatively fixed abilities, such as computational ability, memory limitations, and so on (causation level three).

In other words, in the same way in which a phonetic change tends to follow a certain path once it has started, and to follow this through by means of analogous replacement (i.e. replacement within a set) and increasing frequency,[33] in the same way a morphosyntactic-semantic process of grammaticalization may proceed. The process may indeed be stopped at any way-station on its 'path' (cf. Lass 2000: the process is 'quantal' and not 'continuous'), and may indeed reverse, but a reversal or stop needs certain, possibly quite strong (counter)factors to achieve it. As Plank (1995) has shown in his discussion of the English genitive developing into a clitic, for degrammaticalization to occur strong counterforces seem

to be necessary. In the absence of these, the process is more likely to follow its partly pre-ordained path, the path of least resistance. This is especially true in cases of grammaticalization that involve fixed tokens or fixed tokens within a type (because of their phonetic and semantic reduction, which can only be reversed with difficulty), and much less true in cases of grammaticalization involving only types (such as clause structures).

To sum up, grammaticalization may remain a useful cover term for a frequently occurring phenomenon and a useful heuristic device to guide our investigations (cf. also Campbell 2001b), but it is unlikely to have any independent status as either a mechanism or a cause.

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YCOE: The York-Toronto-Helsinki Parsed Corpus of Old English Prose (http: //www-users.york.ac.uk/~lang22/YcoeHome1.htm)

Notes

[1] This may be partly a terminological question. Depending on one's interpretation of lexicalization, it is by some seen as the adoption of linguistic elements into the lexicon when their interpretation/use is no longer transparent; others consider it a possible stage on the grammaticalization path, while for yet a third group lexicalization is the opposite of

grammaticalization, cf. the discussion in Lehmann (1989), Keller (1998), Wischer (2000), Brinton (2002, who distinguishes as many as nine definitions), Brinton and Traugott (2005). For the third interpretation, see especially Ramat (1992: 550-51), who writes "*lexicalization is thus an aspect of degrammaticalization* … [it] has to be seen as a process whereby linguistic signs formed by rules of grammar are no longer perceived (parsed) in this way but simply as lexical entries." The most insightful analysis of the similarities and differences between the two processes can be found in Himmelmann (2004).

[2] The work in Analogical Modelling so far has concentrated on the constraints posed by formal features (cf. Chapman and Skousen 2005: 345), not on semantic ones. In my view, form as well as meaning would be equally important in analogical processing on the level of morphosyntax.

[3] On the importance on analogy in language change see also Joseph (2003), Itkonen (2005: 105-113), and Wanner (2006: 199ff.).

[4] This, for instance, explains why Bybee and Slobin (1982) have found that the generalizations or schemas used to produce the English past tense forms develop and change with age.

[5] Clark (2003: 207-11) in her study of first language acquisition writes that the available evidence favours a schema-based account rather than a rule-based one.

[6] Signals are passed between neurons via contact buttons, which are called synapses, which can be found on all parts of the nerve cell (see Pulvermüller 2002: 10-13).

[7] I should mention at this point that I am using the terms 'token' and 'type' differently from the way it is used in lexical studies, where a token is one individual instance, and a type refers to the number of instances of one and the same token, i.e. a lexeme. I use 'token' here to refer both to a particular instance of a lexeme as well as the lexeme itself, and 'type' to indicate a set of different tokens that belong together forming a semantic or syntactic category (e.g.

mass noun, abstract noun, or Noun, Verb respectively), or a more abstract syntactic structure (e.g. NP, VP etc.) (cf. also Crystal 1997: 399, under *type* [1]). Children when learning the language have to abstract away form the 'individual' token, to the 'lexeme' token, and from there to more and more abstract categories by means of analogy and system-mapping.

[8] Harris and Campbell (1995: 50-51) recognize 'extension' next to reanalysis and borrowing, as one of the main mechanisms of linguistic change. Extension is seen as part of analogy, which they prefer to call 'analogues'. The latter, however (strangely enough), is not seen as a mechanism of change at all. Kiparsky (forthcoming: 19) argues, as I do here, that analogy (which he defines much more widely as "grammar optimization") is more important than reanalysis: "labelling a change as a reanalysis …doesn't get at its nature or motivation", and he even classifies the claim that grammaticalization involves reanalysis as "virtually a tautology" (for a similar view, see Itkonen 2005: 112-113).

[9] Himmelmann (2004: 25, note 10) makes a useful distinction between narrow and broad grammaticalization. I am here referring only to narrow grammaticalization. Broad grammaticalization would involve only types and no tokens at all.

[10] Hopper and Traugott (2003: 135) note indeed that lexicalization and grammaticalization "may intersect" and are "in many ways […] parallel". The level-distinction proposed here should make clearer what this intersection or parallelism entails.

Himmelmann (2004) also argues, as I do here, that linguists should concentrate on the processes involved in grammaticalization and lexicalization, and that we should not try to explain the differences between them starting from fixed ideas about what is contained in the lexicon and what in the grammar (which he refers to as the 'box' approach). This latter approach is the one followed in Brinton and Traugott (2005), see below.

[11] Note that for Keller (1998: 164) lexicalization and lexical change are the same thing. It includes metaphorical and metonymic processes because the moment that metaphors and

metonyms become *symbolic* (i.e. non-transparent) signs, they become 'lexicalized'. It also includes subjectification because this is seen as 'an application of a metaphorical technique' (p. 214). For Keller the two processes are the same because he does not make a distinction between form and meaning: form and meaning are one (p. 59ff.). For Traugott and Dasher (2002: 283), on the other hand, lexicalization is a *subtype* of lexical change; it "intersect[s]" with but is not "coextensive" with lexical change. This is because their view of lexical change is semantic-pragmatically based; changes in form are seen as a corollary of lexical change, not as something that is intimately bound up with it.

[12] This is what Himmelmann (2004) has called the box approach (cf. note 10 above), which he rejects (rightly, in my view) as a solution to the problem of distinguishing between the two processes.

[13] Muriel Norde (p.c.) suggests that an important distinction between lexicalization and grammaticalization may be that the former is instantaneous and the latter gradual. Here she differs from Brinton and Traugott who define both as being gradual (2005: 97,100). In my opinion, lexicalization or lexical change may be both depending on what aspect one looks at and on one's definition of lexicalization. A *new form* (compound, derivation) added to the inventory is presumably an instantaneous event, but after its introduction it may lexicalize further. Old, already existent forms may change in meaning, and/or become fixed formulas. This often involves specific collocations which may inducing pragmatic inferencing. This process is likely to be gradual (cf. the lexical changes discussed in Lewis 1960). Himmelmann (2004: 35-37) also notes that some lexicalizations are likely to be abrupt, others gradual.

For Brian Joseph (p.c.) there is no real distinction between a gradual and an instantaneous change. He believes that the "point at which an element becomes grammatical […] will always be a 'leap', and thus an instantaneous sort of thing, rather than something gradual." He admits that the "accretion of certain diverse properties as a whole may be

gradual, but the addition of any one property will not be, and the property that finally pushes an element into grammatical status (the straw that breaks the camel's back, so to speak) will result in an instantaneous shift." Joseph may well be right: the way we perceive things may be digital rather than analogue; in other words, in terms of brain processing perhaps only instantaneous shifts exist.

[14] An interesting point about the construction in (6) is that it preserves the basic SVO structure and at the same time allows the topic to occur in initial position making the word order conform more closely to the topic comment order typical of what Givón (1979) has called the 'pragmatic mode'. Quite possibly (but Lambrechts does not mention this) this construction arose as a reaction to the change in the history of French from a Topic- initial to a (more symbolic) Subject-initial type of language (TVX to SVO, cf. Vennemann 1974).

[15] Indeed, this development may be one of the reasons why the *to*-infinitive in English did not generally become bleached of its future orientation as it did in most positions in Modern German and Dutch. In the latter languages the *that*-clause is still a frequent construction after the verbs of persuading and urging; there was no wholesale replacement by *to*-infinitives or, rather, their equivalents. A number of other facts show the essential difference in the use of the English *to*-infinitive as against the German and Dutch *zu*- and *te*-infinitives, indicating that *to*, unlike *zu/te*, is more than an empty infinitival marker: (i) the *zu*- and *te*-infinitives are usually supported by *um*/*om* 'for' to express purpose, while English can make do with a plain *to*-infinitive; (ii) the plain *zu/te*-infinitive may be used to indicate simultaneity, which is not possible with the Modern English *to*-infinitive: cf. Dutch *Hij lag te slapen* (lit. He lay to sleep), 'he lay sleeping' and *Er bereut nicht, seine Familie verlassen zu haben/ Hij heeft geen berouw zijn familie verlaten te hebben* (lit. He does not regret to have left his family), 'He does not regret having left his family'; (iii) English *to* may be split off from the infinitive by an adverb, this is not possible with *zu/te*. For more details, see Fischer (1997).

[16] Cf. Tomasello (2003b: 275), who notes the often confusing use of pronouns by young children who are still in the pragmatic mode.

[17] Cf. Menn and MacWhinney (1984: 529): "strong grounds exist for claiming that there is a general output constraint which tends to prohibit sequences of phonologically identical morphs". This concerns both bound and free morphs, as their examples show. The constraint leads to the use of omission (as in adverbial -*ly* after an adjective in -*ly*), avoidance (in English for instance *who who* and *which which* are avoided) or suppletion. See also Aitchison (1994).

[18] Note also that the so-called *that*-trace phenomenon surfaces differently in English and Dutch. In Dutch, in clauses such as *Wie denk je dat er komt* 'who do you think that will come', *dat* must be present, while in modern English *that* is generally omitted. The same word order difference may account for this.

[19] The examples are in fact used to show the "semanticization of conversational inferences" (p. 90), but it is clear that (12a) presents an older stage where an adverbial phrase is still used as a connective, which in time becomes a conjunction, as shown in (12b).

[20] Mitchell (1964), however, notes that word order is still pretty archaic in this very early Middle English text (which is in part a continuation of a copied Old English chronicle), and more closely resembles Old English than Modern English word order.

[21] Layering itself is problematic because it may involve the layering of variant forms deriving from the same source, as well as the layering of forms which contribute to the same functional domain (cf. Hopper and Traugott 2003: 124-25). In the second case, there is 'renewal', i.e. there is a second grammaticalization cycle at work, presumably coming from another source. Most of Lehmann's parameters would not work in the second case.

[22] Here I follow the interpretation of scope provided by Tabor and Traugott since I am dealing with their suggestion of scope increase. It should be noted that semantic scope is very difficult

to define. There are various interpretations concerning the scope of modals: Bybee *et al.* (1994) follow Tabor and Traugott; for a different view, see e.g. Warner (1993: 16). In addition, purely deontic modals are in themselves difficult to classify because the interpretation depends on the subject selected. Thus *must* in *I must go home now*, would have narrow scope (the VP only) because the speaker is also the agent (i.e. the modal is more dynamic), while in *He must go home*, expressing the speaker's will, *must* would have scope over the whole of the proposition, and could therefore be called subjectively deontic.

[23] It is possible to construe the *þæt*-clause in this example as a subject. As with impersonal verbs (which the modals resemble, see below) the status of the clause is ambiguous. For some discussion, see Fischer and van der Leek (1983: 348-49). According to Bock (1931: 149, 154) the function of both bare and *to*-infinitives, which normally were positioned after the predicate was still very much one of dependence on the predicate; the same could be said for the *þæt*-clause, which in function correlated with the *to*-infinitive.

[24] In what follows I will use the term 'Raising' purely as a label to refer to constructions such as *He seems to be right*. Unlike what is proposed in generative models, I do not accept that the subject *he* is actually raised or moved from a pre-infinitival position to a matrix clause subject position. I believe that such constructions became possible next to older *It seems that he is right* on analogy of other infinitival constructions such as *He intends to be fair*, once the subject position had become more structural in English (more on this below).

[25] The bare infinitive was an action noun to start off with, and in the course of time acquired verbal properties such as the ability to take an object. Since the modal verbs could still take a direct object in Old English, it is possible to see the bare infinitive still as an object of the finite verb (cf. Bock 1931: 124: the infinitive as "analog zu einem nominalen Objekt"). Through analogy, elaborated constructions like *I must help him* also became possible next to *I help him* and *I must help.* This development, and the loss of direct objects after modals, must

have led to the later reanalysis of modal verbs as auxiliaries, which took place roughly at the end of the Middle English period.

[26] For instance the impersonal verb *ofhreowan,* occurs in three different construction types:

(a) without any nominative subject:

him[DAT] *ofhreow* *þæs mannes*[GEN] (ÆCHom I 13 281.12

to-him pity-existed because-of-the man

(b) with the source/cause argument as nominative subject:

þa ofhreow þam munece[DAT] *þæs hreoflian mægenleast*[NOM] (ÆCHom I 23 369 139)

then brought-pity to-the monk the leper's feebleness

(c) with the experiencer argument as subject:

se mæssepreost[NOM] *þæs mannes*[GEN] *ofhreow* (ÆLS(Oswald) 262)

the priest because-of-the man felt-pity

Not all impersonal verbs are found with all three types. This is also true for the modal verbs. They may be used without a nominative NP in both Old and Middle English (cf. type [a], see Warner 1993: 102). They occur both with an inanimate subject (type [b]) and an animate subject (type [c]), when they are used dynamically. Concerning type (a), this only occurs with a complement clause as 'object', the status of which is difficult to determine since it is case-less (cf. Denison 1990: 140-43, and note 35 above). The similarity with impersonals is also not entirely straightforward, but this is because the modal verbs are already semantically idiosyncratic in some respects. Denison (1990: 143) suggests a similar classification for the modals as impersonals but hesitates to accept it fully because of the uncertainty about the existence of a truly subjectless (a) type.

[27] In Old English the subject position was generally filled by the agentive argument, except in intransitive clauses (including passives), where the position could also be filled by the

theme/patient argument. Propositional and dative passives (e.g. *The bed was slept in; He was given a book*) only became possible in Middle English.

[28] I would argue, as is clear from the foregoing discussion, that the mechanism involved in the change is analogy rather than grammaticalization.

[29] The other four cases of scope increase that they discuss in their article, are all somewhat problematic. (i) The case of the English genitive has elsewhere been described as degrammaticalization (cf. Plank 1995 and others), where one would naturally expect scope increase. (ii) It is difficult to see how the development of the gerund from nominal to verbal can be seen as grammaticalization at all because it does not involve any of the other parameters distinguished by Lehmann, such as phonetic reduction, bleaching etc. There is elaboration rather than reduction, which again would go well with scope increase. Another way of explaining this development is the falling together of the present participle in *-ende* and the verbal noun in *-inge*, which is known to be at least a contributory factor. Again this does not point to a grammaticalization process. (iii) the development of *instead (of)* looks primarily a case of lexicalization since it involves a single token, not a type; its use as a sentence adverb, in which it resembles (iv), the case of *anyway*, is also problematic. Cases (iii) and (iv) are discussed in detail in Fischer (2007: Ch. 6).

[30] For the relation between perfect *have* and evidentiality, see Brinton (1996: 243), who notes that source concepts for evidentiality include perfects.

[31] Except perhaps that a more transparent topic/comment order may become replaced by a more symbolic order of elements.

[32] Note that these iconic and indexical relations include metaphorical and metonymic mechanisms, i.e. the mechanisms which are generally seen as most important in grammaticalization. Pragmatic inferencing, also considered a primary factor, is likewise essentially a metonymic process.

[33] Sound change is often described in terms of sound laws, the completion of which seems, as it were, inexorable, the change itself being described as so gradual that it could not be noticed taking place. This was the Neogrammarian view. However, the Neogrammarians only considered changes that had run their full course. Sociolinguists like Labov and Trudgill have shown that sound change synchronically shows up as variation, that many sound changes proceed by lexical diffusion (i.e. analogous replacement), and that they need not run their full course.