

# SEMANTIC RECONSTRUCTIBILITY AND THE COMPLEXIFICATION OF LANGUAGE

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Much of the current debate about the development of modern language from protolanguage focuses on whether the process was primarily synthetic or analytic. I investigate attested mechanisms of language change and emphasise the uncertainty inherent in the inferential nature of communication. Both synthesis and analysis are involved in the complexification of language, but the most significant pressure is the need for meanings to be reconstructible from context.

## 1. Introduction

Grammaticalisation is the historical genesis and subsequent development of linguistic functional categories, such as prepositions and case markers, from earlier lexical items such as nouns and verbs. It is often accompanied by phonetic loss, and is regularly characterised by semantic bleaching and generalisation, or the loss of some specificity of meaning, and the use of a form in new, broader contexts. Despite the existence of some counter-examples (see Newmeyer (1998)), grammaticalisation is widely recognised as being an overwhelmingly unidirectional process. Heine and Kuteva (2002a) have proposed, therefore, that we can make use of this unidirectionality to find insights into the nature of early human language. Hurford (2003) has gone further, and suggested that we need posit the existence of only verbs and nouns, and that auxiliaries, prepositions and all the functional paraphernalia of modern language can be derived through well-understood grammaticalisation processes.

At the same time, there is currently a lively debate in the literature concerning the structure of early human language (or protolanguage) itself (for example, see Tallerman (in press)). Protolanguage is often characterised either as a “slow, clumsy, ad hoc stringing together of symbols” (Bickerton, 1995, p.65), or as being “composed mainly of ‘unitary utterances’ that symbolized frequently occurring situations. . . without being decomposable into distinct words” (Arbib, 2005, p.108). These accounts lead themselves to opposing visions of the process through which modern language developed from protolanguage: either through

a *synthetic* process in which increasing numbers of words are concatenated to express increasingly complex propositions, or through an *analytic* process of segmentation (Wray, 2000), where the unitary utterances are divided into meaningful sub-units and rules which govern their recombination are created.

Very little of this debate, however, is concerned with how protolinguistic utterances would actually have been used and understood by early humans. In this paper, I aim to redress this omission, by exploring the uncertainty of meaning construction in an inferential communicative system. The development of protolanguage into modern human language, and the complexification of language more generally, can only occur when language users can successfully communicate even while they maintain different internal representations of language. I propose that a focus on meaning inference and reanalysis provides us with exactly this scenario, where stable variation in linguistic structure leads to significant language change (Smith, forthcoming). In section 2, I discuss these processes in more detail, explore the inferential nature of the communicative process, and introduce the concept of semantic reconstructibility. In section 3, I explore the effect that semantic reconstructibility has on the replication of linguistic structures in a hypothetical protolanguage, and finally suggest why the inferential reconstructibility of semantic structure holds the key to the complexification of language.

## 2. Grammaticalisation Processes

Metaphorical innovation has long been identified as having a major role in the creation and maintenance of concepts, and in semantic change more generally (Trask, 1996; Deutscher, 2005). Metaphors are normally considered in terms of mappings across conceptual domains, and are crucially not random, but motivated by analogy and iconicity (Hopper & Traugott, 2003), and the desire to express abstract concepts by building on socially-constructed semantic schemas. Lakoff (1987), for instance, shows how English has a large range of expressions relating to anger, which are built on various metaphors comparing anger to heat in a container, fire, and a dangerous animal, among others. Cross-linguistically and historically, one of the most pervasive metaphorical schemas is the conversion of spatial terms into temporal terms (Haspelmath, 1997). In English, this can be seen through numerous examples such as the spatial prepositions *behind* and *around* being used both spatially, as in ‘behind the house’ and ‘around the fire’, and also temporally, in phrases such as ‘behind schedule’ and ‘around noon’.

More interestingly from a grammaticalisation point of view is the derivation of spatial prepositions themselves, which, in languages throughout the world, consistently develop from an apparently universal metaphorical extension of the relative location of parts of the human body. Heine and Kuteva (2002b), for instance, have collected many such examples from languages across the world, two of which are repeated here for illustration:

- (1) a. stomach → in (Mixtec)
- ni- kǎžáa ini ndúčá  
 CPL- drown *stomach* water  
 Someone drowned *in* the water.
- b. breast → in front of (Welsh)
- ger fy mron  
 near my *breast*  
*In front of* me.

Reanalysis, on the other hand, occurs when the structure of an utterance which the hearer infers is different from that which the speaker originally intended. For example, the Latin phrase *clara mente* initially meant ‘with a clear mind’, and was used as a descriptive adverbial phrase. Later, it was reinterpreted to mean ‘in a clear manner’, and this reanalysis led to its being used in other, non-psychological contexts, and eventually to modern French adverbs such as *lentement* ‘slowly’ and *doucement* ‘sweetly’ (Hopper & Traugott, 2003). Over time, the noun *mente* has been grammaticalised into a generalised derivational morpheme *-ment* which can now be attached to almost all French adjectives.

### 2.1. The Communicative Process

It is reasonable to characterise communication as the transfer of some information from a speaker to a hearer, but it is important to recognise that this information is not transferred directly, but indirectly. The speaker wants to convey a meaning, and chooses an utterance which represents this meaning. The hearer, on the other hand, must *infer* a meaning, from pragmatic insights and the wider context in which the utterance is used, and attempt to *reconstruct* the speaker’s original meaning. Communication succeeds when this reconstruction succeeds.

This inferential process of meaning reconstruction, however, is fraught with uncertainty, as famously shown by Quine (1960). Individuals can therefore not be certain of inferring exactly the same meanings as each other. The inevitable re-analyses of utterances which take place during meaning construction cause the development of (slightly) divergent internal linguistic representations. Fortunately, however, there is a degree of slack in the communication process as well: it is not usually necessary for the hearer to reconstruct the original meaning *exactly*, in order for the communication to succeed sufficiently. Latin speakers, for instance, could happily use *clara mente* to mean either ‘with a clear mind’ or ‘in a clear manner’ in most contexts without any fear of confusion, because only rarely would any significant difference arise.

Speakers and hearers play different roles in the development of a negotiated, language-like, communication system: although utterances are produced by

speakers, their meanings must be successfully reconstructed by hearers if they are to be replicated in future communicative episodes and generations (Croft, 2000). Utterances which cannot be interpreted by hearers will neither succeed in communication nor be replicated. Metaphorical innovation, then, is a speaker-driven innovation, deriving from the speaker's desire to express concepts which lack words. A speaker will not merely invent a random expression, which is unlikely to be understood by the hearer, but will build on an existing system, extending it systematically and predictably, so that the hearer will be able to reconstruct the appropriate meaning from the social and linguistic context. Reanalysis, however, is the unconscious yet inevitable result of the uncertainty involved in the hearer's inferential reconstruction of meaning. As long as the communicative episode succeeds sufficiently, the hearer cannot verify that their reconstructed meaning is exactly the same as the speaker's, and so different representations will inevitably co-exist. Certain kinds of pragmatic inferences are more likely to be made in this process than others (for instance, the inference that travelling somewhere to do X implies that X will happen in the future), and therefore the same kinds of reanalyses will recur, both cross-linguistically and historically. The internal nature of meaning reconstruction, moreover, means that divergent reanalyses can remain hidden in internal linguistic representations for some time, with individuals communicating through utterances which they map to slightly different meanings.

Inferential communication, therefore, and the negotiation and reconstruction of meaning at its heart, results naturally in systematic changes in mappings between utterances and meanings. In order for any utterance to be replicated, it must be able to be reconstructed by hearers; all speaker-driven innovations are therefore tempered by the over-arching need that they be able to pass the test of the inferential reconstructibility of meaning.

### 3. Holistic Protolanguage

What does the requirement for semantic reconstructibility imply, then, for the nature of early human language? Wray (2000) models the evolution of language from a holistic ancestor through a segmentation process. Example 2 shows part of her hypothetical initial holistic language, in which arbitrary forms are coupled with arbitrary meanings.

- (2) a. tebima  
give-that-to-her
- b. kumapi  
share-this-with-her

Neither the forms nor the meanings are initially segmented in any way, so the whole of the utterance corresponds to the whole of the meaning. Language users, however, have the potential to *analyse* their mappings, and so take advantage of

coincidental correspondences between parts of utterances and parts of meanings. For instance, the language user may notice the chance correspondence between the segment *ma* in the utterances and the meaning component ‘her’, and modify their internal representation to something like that shown in example 3.

- (3)
- a. tebi X  
give-that-to Y
  - b. ku X pi  
share-this-with Y
  - c. X = ma  
Y = her

Over time, repeated segmentation leads to a system of word-like sub-units and linguistic rules governing their recombination. Kirby (2002) and others have used computational simulations to demonstrate the emergence of compositional language from a holistic ancestor using this very technique. However, it has also been recognised (Smith, 2003) that the form of the resultant ‘emergent’ syntax in such models is effectively predetermined by the explicit coupling of utterances and meanings, the initial complex representation of meaning which is chosen, and the kinds of generalisations which are allowed or assumed<sup>a</sup>.

Holistic accounts of protolanguage assume that, although the utterances are monomorphemic, they represent an entire, complex proposition, albeit initially unanalysed. Such propositions are supposedly represented in protolanguage because they are ‘complex, but frequently important situations’ (Arbib, 2005, p.119). Many of the semantic structures suggested in the literature, however, are even more complex than Wray (2000)’s examples; we should be very sceptical of their proposed status as ‘frequently important’. Mithen, for example, suggests that early humans might have had a holistic message with a meaning like ‘go and hunt the hare I saw five minutes ago behind the stone at the top of the hill’ (Mithen, 2005, p.172). I suggest that it is utterly implausible that early humans would have considered such a specific proposition so frequently important that it should have its own utterance. Tallerman (in press), moreover, raises the important question of just how many such unanalysed structures an early human could be expected to memorise, though it is difficult to see how this could be conclusively answered.

More importantly, however, it is surely wholly unlikely that any hearer could possibly reconstruct such a complex meaning from context, without any help at all from the structure of the utterance, which is of course both holistic and arbitrary in

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<sup>a</sup>For instance, if predicate-argument structure is used to represent meanings (Kirby, 2002), then the resultant syntax consists of sub-units corresponding directly to ‘predicates’ and ‘arguments’; if meaning is represented as a multi-dimensional matrix (Brighton, 2002), then the resultant syntactic units correspond directly to the dimensions of the matrix.

its form. But without such reconstructibility, the utterance could not be replicated, and thus would become extinct almost immediately it was born. The putative semantic complexity of holistic protolanguage, therefore, seems to be on the one hand the driving force behind the analytic development of modern language, but on the other, presents a major credibility problem of semantic reconstructibility for these same holistic accounts.

### **3.1. *Meaning Reconstruction***

The problem may be overcome, however, if we consider what actually *is* reconstructible with any degree of accuracy from an unstructured signal. Even if it were conceivable that a speaker might wish to produce an utterance corresponding to 'go and hunt the hare I saw five minutes ago behind the stone at the top of the hill', it is not plausible to assume the hearer either 'receives' this meaning accurately, or reconstructs it to such a highly complex degree. In fact, I would suggest that hearers would only need to reconstruct the meaning to a level of detail and complexity which is sufficient for them to understand the utterance in context, and contrast it with others in their communication system. Inevitably, the meanings of protolanguage utterances would have been rather simple and easily inferred.

It may be useful to consider an analogy with the famous vervet monkey call system (Cheney & Seyfarth, 1990) at this point. The vervets make three different calls, which correspond to their noticing the presence of three different groups of predators; these situations are therefore clearly analogous to Arbib's 'frequently important situations' above. But what do their calls mean? They could correspond, in a Mithen-esque account, to very complex propositions such as 'Everybody! Quick! I think I saw an adult male snake over there by the trees where we normally eat. Let's cluster together into a big group and look in the grass!'. But in reality it's more likely that the inferred meaning will only be reconstructed to a level of detail which is just enough to allow it to be understood, and to contrast with the other utterances in the system; in fact something very simple, rather like 'snake'. Similarly, early humans are likely to infer that the meaning of Mithen's protolinguistic utterance is simply 'there's a hare' or 'I'm hungry', depending on the context in which the utterance was heard, and on the existing meanings in their communication system, from which this inferred meaning must be disambiguated. Even if we accept that early humans were capable of conceiving complex meanings, therefore, we should not assume that such complexity was needed for communication. Simple meanings, by virtue of their better reconstructibility, are much more likely to be used and to be maintained in the language.

### **3.2. *Complexification***

By default, therefore, the inferred meaning of protolanguage utterances would in fact be very simple, probably referential, and, crucially, reconstructible from the context in which they were uttered. As the number of utterances increased, it is

possible that the reconstructed meanings could become slightly more complex, in order to maintain contrast with the others in the system, yet still remain communicatively viable. Even a slight increase in complexity would open the door for reanalysis and segmentation, by taking advantage of coincidental co-occurrences across multiple utterance-meaning pairs, as Wray (2000) describes.

The involvement of synthetic processes, however, cannot be ruled out. Unless there is a very strict convention of role-taking, indeed, natural discourse processes will ensure that consecutive simple utterances are inevitably concatenated together and processed as a whole by hearers, whether or not this was the speaker's intention. As always, however, the continued propagation of any such complex utterance through a linguistic community is completely dependent on the reconstruction of its meaning by the hearer. The hearer may be prompted by their existing knowledge of the meanings of the two individual (sub-)utterances to reconstruct a combined, complex meaning for the whole, or they may reconstruct a simple meaning, and thus lose the potential innovation introduced by the speaker. At some point, however, some useful and slightly more complex meanings may well become established in the negotiated system. Coincidental co-occurrences will allow such meanings to be eventually decomposed into their sub-parts, and then the resulting constructions can be analogically and metaphorically extended, to be used in other utterances. If the compositional constructions are productive, and their meanings remain reconstructible, then they will be replicated faster than holistic mappings (Kirby, 2002), and a structured system will develop.

#### **4. Summary**

Utterances are produced by speakers, but their replication depends on them being reconstructible by hearers. Any speaker-led innovations in language, therefore, must be as predictable and natural as possible, building on analogy, iconicity, and existing socially-constructed schemas. Both synthetic and analytic processes are implicated in the development of modern languages from ancestral protolanguage. The most significant pressure, however, comes from the need for meanings to be inferable, and reconstructible from context.

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