Entrenchment, conventionalization and cumulative culture: A usage-based perspective on language evolution

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This paper discusses how concepts from usage-based linguistics can prove fruitful in investigating the evolution of language. In particular, we outline recent developments in usage-based approaches to language and explore how they can inform an account of how fully-fledged language emerged from protolinguistic communication. Specifically, we focus on the concepts of entrenchment and conventionalization as well as their interaction in processes of language change and grammaticalization, and we discuss whether and to what extent such concepts can also account for the emergence of structure in hominin interactions.

1. Introduction

Recent years have seen increasing parallels in the theoretical developments within evolutionary linguistics and usage-based linguistics (e.g. Verhagen, 2021; Pleyer & Hartmann, 2024). In particular, both have converged on the view that the development of fully-fledged human language can be conceived of as the cultural evolution of a complex adaptive system, i.e., a system whose global characteristics emerge from myriads of independent interactions at a more local level (e.g. Beckner et al., 2009; Kirby, 2012; Steels, 2011). In addition, both approaches have increasingly stressed the importance of interaction as the "core ecology for language use" (Levinson & Holler, 2014), which must have played a significant role in how language emerged (e.g. Scott-Phillips, 2015). Given these parallel developments, here we explore in more detail the implications of a usage-based perspective for language evolution, focusing on theoretical frameworks that have been proposed in usage-based linguistics fairly recently.

Usage-based theory sees language structure as arising from interactional and cognitive factors operating on repeated instances of actual language usage.

Linguistic systems are conceived of as dynamic networks of symbolic form–meaning pairings, i.e., constructions, and they are recognised to be shaped by the needs and biases of communication, social interaction, cultural transmission and human cognition (Croft, 2000; Diessel, 2019; Kirby, Tamariz, Cornish & Smith, 2015). Usage-based approaches have proven successful in modeling how children "construct a language" through generalizations and schematizations over repeated instances of language use (e.g. Tomasello, 2003), and how usage-based forces shape language in diachronic, historical language change (e.g. Bybee, 2010).

However, from both the perspective of usage-based approaches and evolutionary linguistics, there is no sharp distinction between the initial emergence of language, on the one hand, and the cultural evolution of language(s) on the other. This means that "there is every reason to suppose that the very first grammatical constructions emerged in the same way as those observed in more recent history" (Bybee, 2010: 202). What follows from this is that the mechanisms uncovered in usage-based approaches regarding the dynamics and mechanisms of language change can also be applied to explanations of the evolutionary emergence of language.

Specifically, we argue that usage-based mechanisms documented in language change can help explain the gradual transition on a protolinguistic–linguistic continuum after the emergence of the first (proto)constructions in hominins (see also Hartmann & Pleyer 2021). Once recurrent solutions to communicative problems in hominin interactions started to re-occur more frequently, this led to increasing degrees of entrenchment of these communicative solutions on the cognitive side, and on the social side to their diffusion and spread throughout hominin communities of practice. Shaped by usage-based factors, they were then subject to processes of cumulative cultural evolution, leading to the emergence of modern linguistic constructions that are cognitively entrenched and socially conventionalized. In addition, we argue that usage-based forces not only have the potential to explain the gradual transition towards fully-fledged languages. They also have the potential to explain how the first protolinguistic constructions emerged in interaction, thereby kickstarting the process of the cumulative cultural evolution of language (Pleyer 2023). In the remainder of this paper, we will first describe usage-based mechanisms in linguistic and cultural evolution. In particular, we will focus on the role of the processes of entrenchment and conventionalization, as highlighted in Schmid's (2020) Entrenchment-and-Conventionalization Model. Following this, we will then outline how many of the same processes can be used to explain the emergence of fully-fledged modern languages.

2. The role of entrenchment and conventionalization in linguistic evolution

Schmid's (2020) Entrenchment-and-Conventionalization Model is a recent example of a big-picture attempt to capture the effects of usage, culture and cognition on language structure. The design of Schmid's model takes the following two principal dimensions as its starting point: the cognitive level of the individual speaker on the one hand, which Schmid labels as the macro-process of *Entrenchment*, and the socio-pragmatic dimension of speech communities on the other hand, labeled *Conventionalization*:

> *Conventionalization* is the continual process of establishing and readapting regularities of communicative behaviour among the members of a speech community, which is achieved by repeated usage activities in usage events and subject to the exigencies of the entrenchment processes taking place in the minds of speakers.
> *Entrenchment* is the continual reorganization of linguistic knowledge in the minds of speakers, which is driven by repeated usage activities in usage events and subject to the exigencies of the conventionalization processes taking place in speech communities. (Schmid, 2020: 2)

The two dimensions meet and interact in usage, allowing for the updating and alignment of mental representations and linguistic norms. Under each of the two principal dimensions or macro-processes, a range of more atomic forces or subprocesses can be subsumed. On the cognitive side, such processes include analogy, chunking, conceptual metaphor and coding efficiency, among others. On the socio-pragmatic side, there are motivations such as social fitness and extravagance and mechanisms such as pragmatic inferencing, accommodation and diffusion.[1] The basic idea of the theoretical blueprint just outlined is that interactions and feedback loops within and between the two dimensions, as well as their subprocesses, lead to linguistic structuration.

In fact, several usage-based models (e.g. Bybee, 2010; Traugott & Trousdale, 2013; Schmid, 2020) converge on the idea that multiple cognitive and socio-pragmatic forces, including those listed above, are at work to advance structuration and diachronic grammaticalization. In the minds of individual speakers, recurrent linguistic sequences fuel chunking. In chunked representations, syntagmatic associations are strengthened while paradigmatic associations to other instances of the chunk's lexical components are weakened. This allows emergent grammatical constructions to emancipate from their concrete lexical sources and take on a life cycle of their own. Over time, grammaticalizing constructions acquire more abstract, schematic meanings through pervasive thought processes such as metaphor and metonymy (e.g. Heine

[1] The conceptual and terminological choices that Schmid makes to characterize these forces are specific to his particular model, but they are in line with mechanisms and motivations that are widely recognized in the usage-based literature and which we decided to adopt in the present paper.

et al., 1991). In the textbook example of the English auxiliary *gonna*, the abstract target meaning of futurity is related to the source meaning of motion not only through the fundamental TIME-IS-SPACE metaphor but also through the metonymic link between moving with an intention ('be going in order to') and likely future events. Conceptual metonymy (i.e., accessing a target concept via another salient, experientially closely related concept) is, moreover, one of the forces that links the cognitive dimension of change and the socio-pragmatic dimension, as many steps of grammaticalization depend on speaker–hearer interaction. Metonymy structures conceptualization while hearers are inclined to draw rich pragmatic inferences as part of efficient, cooperative communication (Panther & Thornburg, 2003; Traugott, 1988). Thereby, grammaticalizing constructions can assume new procedural functions as interactants negotiate meanings in context. In socially situated accommodation, communication partners often converge on similar structures, which allows novel structures to become more than one-off patterns in a single speaker and to be replicated by others in future usage events (e.g. Brône & Zima, 2014) When proving structurally and/or socially effective, linguistic innovations diffuse to more contexts and users. They usually begin to diffuse in local social networks and tight communities of practice before being propagated into wider communities (Milroy, 1980; Nevalainen et al., 2011). Increasingly frequent use leads to "inflationary" effects (Dahl, 2001) whereby grammaticalizing constructions lose in pragmatic and semantic value. As their meaning contributions become discursively secondary and their syntagmatic predictability increases, grammaticalizing constructions also tend to reduce in phonetic substance. This results in the typical cline of increasing morphological bondedness, with nouns and verbs transforming into unstressed function words and ultimately into inflectional affixes. Overall, usage-based theoretical approaches such as Schmid's (2020) Entrenchment-and-Conventionalization Model demonstrate that dynamic linguistic systems can be explained comprehensively based chiefly on humans' general cognitive capacities and general socio-pragmatic/cultural processes. The channel of interaction for the individual mind and communal norms is the socially situated use and exchange of structures in repeated usage events.

3. The dynamics of cumulative culture and usage-based forces in language evolution

The cognitive, interactional and social forces attested in diachrony as a form of cumulative cultural evolution can help explain the gradual transition of protolanguage to modern language. However, a usage-based approach to language evolution can go further than that by also identifying a central locus of the emergence of linguistic structure: that of usage and interaction. That is, one

crucial starting point for the emergence, diffusion and eventual conventionalization of structured communicative patterns is that they emerge as successful communicative strategies within an interaction.

In a complex adaptive system view, we can locate these processes on different interacting and connected timescales (cf. e.g. Enfield, 2014; Kirby, 2012; Steels, 2011). On the diachronic or "glossogenetic" (Hurford, 1990) timescale of cultural-historical change, new linguistic constructions emerge and become conventionalized within a population. The timescale that fuels and feeds into these cultural-historical processes is the "enchronic" (Enfield, 2014), or interactional timescale. On this timescale, new construction patterns emerge through social interactive and cognitive processes over the timespan of a conversation. It therefore represents a puzzle piece that links processes of grammaticalization and cumulative cultural evolution with the process that creates the "reusable material" for these processes.

4. Entrenchment, conventionalization and cumulative culture in language evolution

On the view presented here, usage-based forces of entrenchment and conventionalization lead to the cumulative cultural evolution of language. The likelihood of the re-emergence of particular structures would be boosted by their usefulness in interaction, leading to their increasing consolidation and entrenchment in memory. This would have also made them more likely to be used with different communicative partners, which in turn would lead to these structures emerging and spreading throughout the community. Such structures would gain the status of tacit norms: expected ways of jointly solving particular communicative challenges, a process Schmid (2020) refers to as "usualization." With increasing usualization and the repetition of particular usage activities in interactive encounters, emergent patterns would increasingly become conventionalized. They would therefore represent "what has been ritualized from interactions" (Thompson & Cooper-Kuhlen, 2005). This view is supported by simulations of interacting agents (Barr, 2004). These agents were shown to establish and maintain a shared symbolic conventional system by updating their behavior based on local, dyadic interactions instead of by adhering to system-level, global information. This view is also supported by research showing that systematic structure can emerge in communities of interactants over multiple repeated encounters without the need for generational transmission and turnover (e.g. Fay et al., 2010; Nölle et al., 2018; Raviv et al., 2019).

On the cognitive side, processes of entrenchment could also have introduced one of the key features of the complex network of constructions characterizing modern languages: the fact that these networks contain form–meaning pairings of

different degrees of schematicity/abstractness and complexity (e.g. Goldberg, 2003; Stefanowitsch & Flach, 2017). Constructions range from fully concrete, specific constructions such as word constructions (*Australia*, *armadillo*), to more abstract and complex constructions such as affix schemas (such as [STEM]-[AFFIX] as in *bloody*, *colorful*) and the ditransitive construction (SUBJ V OBJ1 OBJ2, such as *I put a shrimp on the barbecue*). In the process of becoming more habitual, automated and entrenched, complex constructions often become more schematic. The usage profile of a construction expands incrementally, influencing its mental representation to become more productive and general (De Smet, 2016; Neels, 2020). This process could also explain how emergent protoconstructions in hominin communities of practice became increasingly schematic and complex. Importantly, research in the paradigm of experimental semiotics (e.g. Galantucci, Garrod & Roberts, 2012; Nölle & Galantucci, 2023) demonstrates that the evolutionary trajectory towards complex symbolic systems can be set in motion even when interactants confronted with a communicative task start out with no shared icons or symbols at all.

5. Conclusion

In this paper, we have presented a usage-based perspective on language evolution. We outlined usage-based mechanisms in linguistic evolution, particularly as they pertain to diachronic change, especially grammaticalization. These processes operate on the cognitive level, on the one hand, and on the community level on the other, through the channel of usage. On the cognitive level, this includes the mechanisms involved in entrenchment. On the cognitive level, it includes the mechanisms involved in conventionalization.

In the context of cumulative cultural evolution, this cascade of interlocking processes can help explain how the first protolinguistic structures emerged, how they subsequently increased in complexity and structure, and how they spread through communities. They therefore have the potential to explain two key aspects of language evolution from a usage-based perspective: a) the first emergence of (proto)linguistic structures; b) the gradual transition toward the modern human language pole on the protolinguistic–linguistic continuum through cumulative changes in hominin communities over a long period of time. Temporary, emergent communicative routines turned into inventories of firmly entrenched and community-wide communicative routines: protolanguages. These communication systems developed increasing degrees of conventionalization and accumulated innovations and wider contexts of use through processes of cumulative cultural change, evolving into fully grammaticalized and conventionalized structured inventories of constructions shared by communities of practice: languages.

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