Evolution in Linguistics – Conceptual Innovation, Metonymy, and Miscommunication

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Abstract

Conceptual innovations in science ('paradigm shifts' in the sense of Kuhn) come with changes in the meaning of basic terminology in that field. Linguistics is no exception. But linguistics is in the peculiar position that it comprises the study of the meaning of linguistic items, and the way these meanings change. Some basic ideas of cognitive semantics, especially the concept of metonymy, shed light on the risk of miscommunication in a scientific field in a period of innovation. Paradoxically, these risks are instantiated in a controversy in the field of linguistics itself that was triggered by the then new, Darwinian understanding of evolution. The paper ends by exploring a recent theoretical innovation (the 'usage-based' approach, especially its most recent variants) that holds a promise for overcoming the controversies, provided theoretical linguists accept that terminology also in their own field is to be semantically more precise than in everyday language use.

1. Introduction: Language Items as Coordination Devices

Words and constructions – for short: language items – are just one type of signals that people employ for intersubjective coordination. It is useful to give a brief overview of the different types of signals that human beings have at their disposal, to bring out what is special about linguistic ones.

A basic type is pointing, analyzed as a special human communicative device in several publications by Tomasello (2008 in particular), among others. By pointing to some object in our shared environment, I make you attend to it so that it becomes an object of *joint* attention, and I invite you to make inferences about my motivation for this action, based on our mutually shared knowledge – our "common ground". The signal is the same on every occasion of use, but the differences in common ground allow for different interpretations on every occasion: HAND ME IT, PICK IT UP, WATCH OUT FOR IT, DO YOU AGREE THIS IS FUNNY?, and so on.

A second type consists of gesturing (including acoustic gesturing), images, and the like. I can turn something into an object of joint attention by presenting a simulation, and through that invite

you to make relevant inferences, again: based on common ground. In this case, we have a variety of signals, but the same signal can still have various interpretations, depending on the common ground. A picture of a dog can convey PET SHOP in one case and a WARNING in another, my humming a melody can be a question WHO WROTE THIS SONG? in one context, or an instruction TRY TO IMITATE THIS in another, and so on.

And then we have language items. These allow us to make something an object of joint attention by exploiting cultural conventions: the concept HAMMER is conventionally associated with the sound shape *hammer* in a particular community of people (called "speakers of English"), so that I can use that sound shape to make the idea of a hammer an object of joint attention if you and I both belong to this community and the latter fact is moreover common ground. As in the previous case, we have a variety of signals, but the same signal will have different interpretations on different occasions of use, depending on the specific common ground: my saying *hammer* may convey GIVE ME THE HAMMER on one occasion, and USE A HAMMER on another, and so on.

All three types of signals are devices that people use to make something an object of joint attention and thereby have their communication partner make inferences that allow them to coordinate their mental states and ultimately their actions. What is specific about language items is the fact that they are themselves part of the common ground of communicators through their belonging to the same cultural group, members of which share a set of conventions. Language items are historically evolved and community bound. They are cultural coordination devices, available to the members of a particular community – unlike pointing and simulation, which are available to human beings universally. The conventional nature of language items can cause terminological and conceptual problems when the common ground undergoes change, especially when the nature of this change is not (fully) recognized by all participants.

2. Scientific Terminology

Scientific terms are just language items: conventional coordination devices available to a community of scientists for coordinating their ideas and research activities, by allowing them to invite each other to make inferences based on mutually shared knowledge. In a scientific community, this crucially involves shared scientific insights. As a consequence, a specific kind of semantic change occurs when scientific insights in a particular domain change, especially when

theories change in a fundamental way. Thus, Kuhn (1996[1962]) points out that the Copernican revolution in astronomy changed the meaning of the term *planet*: the sun no longer belongs to the category, while the earth does (id.: 128/9). Similarly, the Einsteinian revolution in physics changed the meaning of the term *mass*; even in limiting cases at low velocities where the formal equations become equivalent to those of Newtonian mechanics, the term still denotes a different concept: Einsteinian mass can be converted into energy, Newtonian cannot (id.: 101/2). But at the same time, some aspects of the meanings of the words are maintained (which explains the very fact that they can remain in use). In the case of *planet*, not only did a substantial amount of phenomena remain as members of the category, the concept of rotation around a center persisted as well. And although mass is equivalent to energy in the theory of relativity, it is crucially linked to a conservation law in both theories: mass in Newtonian mechanics, the sum of mass and energy in Einsteinian.[1]

This situation gives rise to a special kind of potential miscommunication. When scientific insights and theories differ between communities of scientists, or when members of different communities do not have the same (deep) understanding of a new theory (or, for that matter, any other theory than the one they are familiar with), then various communicative events run the risk of going haywire, because participants may use the same terms with different senses, inviting different inferences, without noticing it. Think of discussions about the pros and cons of old and new theories, or across-framework discussions in general, or the education of novice scientists (who will always already have *some* conception of the conventional meaning of the terminology involved). Such situations actually require at least some awareness of possible semantic differences in the use of the same terminology, but this is frequently absent – with all the consequences that it entails.

This is precisely the diagnosis of the situation with the terms *nature* and especially *evolution* in the history of linguistics since the publication of Darwin's *Origin of Species* in 1859. Keller (1994: 45-52) provides an insightful discussion of the conceptual "prison" of the dichotomous division of the world into natural phenomena and artefacts that prevented 19th century linguists from seeing

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1. An interesting case in modern linguistics is the notion of 'linguistic feeling/intuition'. Foolen (2023: 273-278) shows that both structuralist and generative approaches consider it an important source of empirical evidence for linguistic structure, but it is tied to judgments about distinctiveness in the first case ("Are these two sounds allophones or not?"), and about grammaticality in the second ("Is this a possible sentence of the language or not?").

language as belonging to a third kind of phenomena. But I think there is even more involved, which can profitably be stated in terms of some polysemy of the term *nature*, also in Darwin's work, but especially in terms of an innovation in the concept of evolution that went unnoticed in the linguistic debates. My contribution is thus intended to complement Keller's account, and like Keller's, it is also still relevant for present day discussions.[2]

3. Darwin and Evolution

The term *evolution* was already in use as a scientific term among geologists and students of 'natural history' since the early 19th century.[3] Etymologically going back to the sense of 'unfolding' (of scrolls), it was then in use in these communities for the phenomenon of one species changing into another (along with *transmutation*). It was also used for the process of development from embryo to adult organism. Both were thought to involve a process of gradual change, along preprogrammed lines.

In the first edition of *Origin*, Darwin does not use the term – the verb *evolve* is used, but only once, at the very end of the book. Perhaps the reason was precisely that he was proposing an entirely new explanation of the formation of new species that did not resonate well with the then conventional sense (Toulmin, 1972: 331, fn.1). However, the term was already in common usage for the change of species through historical time, also by Darwin's associates, and he adopted it soon afterwards. I will therefore ignore this complication at the very beginning of the modern theory of evolution (it would be an interesting intellectual history project on its own to unravel these details, if possible).

What was the nature of the conceptual shift entailed by the Darwinian revolution? It comprises two essential elements: one concerns the general character of the mechanism leading to change, the other the actual source of one specific component of this mechanism.

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2. I will only cite from Schleicher's and Whitney's writings here, not Max Müller's. His position differs from the others (cf. the citations in Keller, 1994 and Alter, 2005, esp. ch.6), but I think similar points can be made about the lack of understanding of the full implication of population thinking. Moreover, Müller had a special interest in the question of the evolutionary origins of language, on which he also changed his views, partly in discussions with Whitney (cf. Alter, 2005, ch.8).

3. Wilkins (2001) provides an excellent overview of the history of the term, including its various senses and some risks of misunderstanding associated with them.

Darwin's first discovery was a new type of process of change that can be summarized in the following way. Consider a collection (a 'population') of replicating entities (e.g. organisms), characterized by the following features:

1) **Variation**. The members of the population are not completely identical; they are all variants.

2) **Selection**. Some variants, say those possessing a feature F, have a higher chance to be replicated than those without F.

3) **Heritability**. The feature F is passed on in replication relatively reliably (in the case of organisms: offspring resemble their parents more than an arbitrary member of the population).

What Darwin realized was that it is a mechanistic consequence, inevitable, that over a series of replication steps ('generations'), the relative frequency of F in the population will increase. In fact, as long as the situation underlying point 2, selection, is stable over time, the feature F will ultimately become completely dominant in the population, however small a fraction of the population had it initially, and however slight the difference in chances of replication. This is true for any collection of replicating entities that exhibit these three characteristics: this process of change can be characterized in terms of an algorithm, the repeated application of which produces a result (the final population) that is quite different, in at least one respect, from the initial one.

The other discovery was natural selection. Darwin's second major conceptual leap was to realize that it was not necessary for the algorithm to work that any agent actively performs the selection (as in the case of breeding), but that nature itself, by providing only limited resources, enforces a struggle for survival, and thus selection, given that all populations of organisms consist of variants.[4] By the same token, this insight removed the idea of change along preprogrammed lines from the concept of evolution. The meaning of the term *evolution* thus got disconnected completely from its original sense of 'unfolding', as a consequence of the new theoretical framework it became embedded in.

4. Lexical Semantics and *Evolution*

In lexical semantic terms, what happened to the meaning of *evolution* was that it started with the sense "process of gradual change" and then acquired the specific sense of "a process of change

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4. In his autobiography, Darwin writes that he got the idea when he "happened to read for amusement Malthus on *Population*" (http://darwin-online.org.uk/content/frameset?pageseq=124&itemID=F1497&viewtype=side).

characterized by the logic of Darwin's theory". The second sense is an *extension* of the first, applicable in a special context, and in use in a particular community. The first sense does not disappear; it remains in use in the wider community, and thus also among the members of the particular community who are included in the wider one; this state of affairs is represented graphically in Figure 1, with the heavy lines of the box at the left indicating wider usage, and possibly, for several users, deeper entrenchment.[5]
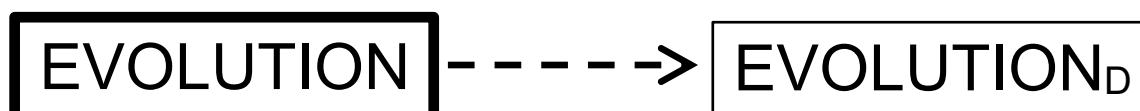
FIGURE 1   Darwinian *evolution* as extension of *evolution*

Such a semantic extension actually includes the formation of a distinction between, in this case, Darwinian and non-Darwinian senses of *evolution*, and of a *schematic* concept of what the two have in common; cf. Figure 2, where the arrows indicate that the schematic sense is instantiated in the specific senses:
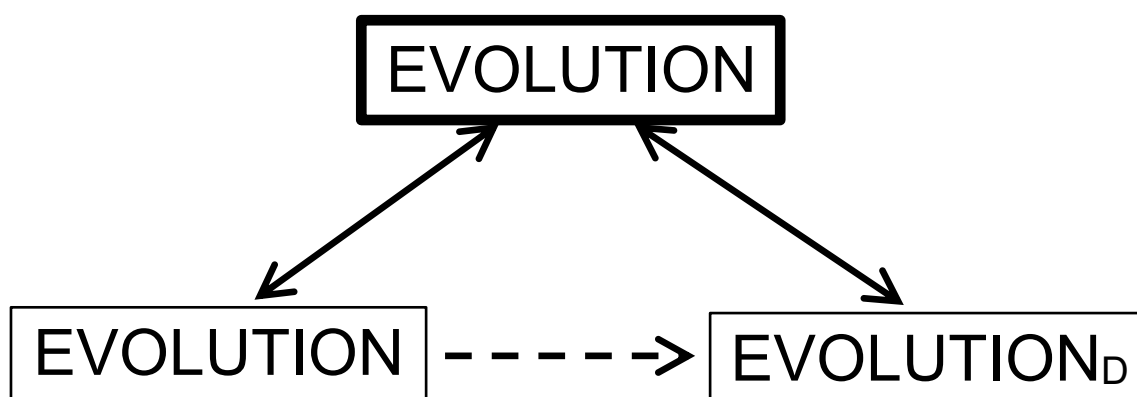
FIGURE 2   Emerging polysemy of *evolution*

Such a polysemy of lexical items is a common phenomenon, and in general not a source of problems in communication, precisely because the latter process is an inferential one in which

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5. This phenomenon of lexical semantic change, including the further steps discussed in the text, is just another instance of a very general semantic process; cf. Langacker (2008: 224-226), who uses the example of *mail* extending in meaning to include electronic mail, which at present is the default sense for many speakers of English. Here I incorporate the distinction between community level and individual level phenomena, the importance of which will also become manifest below (and also Verhagen, 2021a, lectures 1 and 2).

mutually shared knowledge (common ground) plays a crucial role. As we have seen at the start, words are just tools to trigger inferences that make sense in the common ground of the communication participants. So astronomers (and laymen) can speak of the "evolution" of the solar system[6], and in some respects that story includes elements that we have seen above, especially variation in size and composition of the objects in the protoplanetary disk around the young sun, some of which have a better chance of persisting ('surviving') than others. But clearly, no process of replication of variants plays any role in this process, so it is a relatively gradual change over a long period of time, the end result of which differs considerably from the initial state, but not a case of Darwinian evolution. Given the elementary differences between the theories involved, there is really little risk of misunderstanding.

But the actual common ground may differ from what the participants think it consists of when the communities (of scientists, in this case) they belong to overlap to some extent, but not completely. In the case of *evolution*, the specific Darwinian sense has, understandably, become dominant in the community of biologists. In fact, so much so, that this sense is the default or prototype for the members of this community, as depicted in Figure 3.
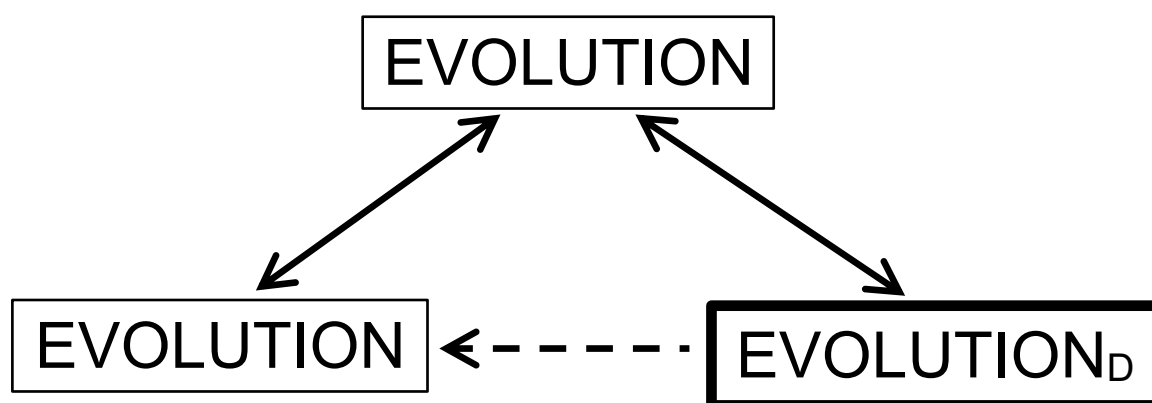

FIGURE 3 Restructured network of senses in a specialist community

Here, the bottom arrow points leftward, indicating that for these users, the non-Darwinian sense of the term is a special case. In fact, if your understanding of the term *evolution* is limited to change of biological species through natural selection, then the notions of Darwin's algorithm, natural selection, and life constitute indispensable elements of the term's sense, and you will consider its application to another domain (e.g. the physical or cultural world) metaphorical, as it involves

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6. Cf. https://en.wikipedia.org/wiki/Formation_and_evolution_of_the_Solar_System

ignoring (some of) these features; this is indicated in Figure 4. Since no conceptual features are

added in metaphorical use, no schematic generalized concept is necessarily included in this kind

of extended use, although this is not impossible (when the metaphor is used regularly, and

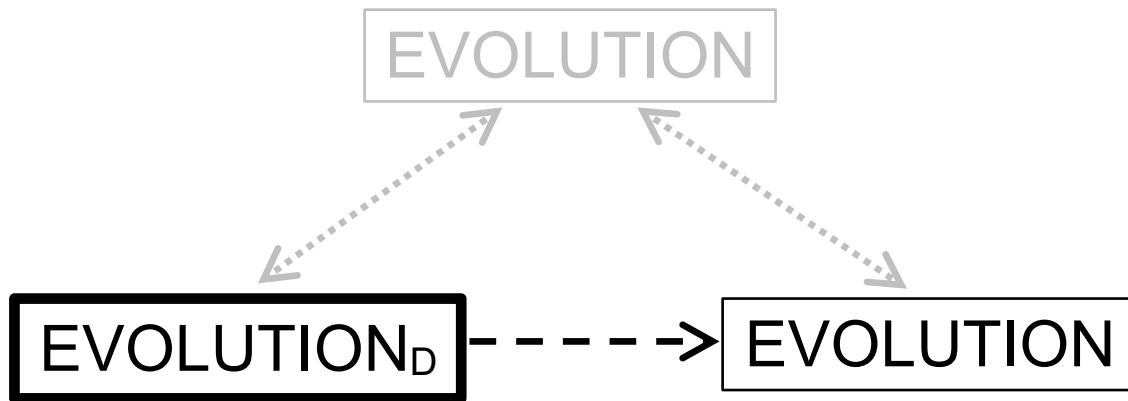becomes somewhat conventionalized; hence the light grey top part).

FIGURE 4 Metaphorical use of Darwinian *evolution*

Recall that Darwin's discovery consisted of two components: 'Darwin's algorithm' and natural

selection. The latter element was included in the title of his main work: *On the Origin of Species by*

Means of Natural Selection. The structure of the book presents the concept of natural selection as

complementary to artificial selection (breeding): it starts with a broad overview of breeding,

clearly intended to convince the reader that selection over several generations can and does

produce new races of plants and animals. Once this has been demonstrated with a wealth of

evidence, the idea is introduced that nature itself is a selective force as well, again demonstrated

with a wealth of evidence. The emphasis on natural selection makes absolute sense, but the first

element, 'Darwin's algorithm', is no less significant: it defines a whole new class of processes of

change that had not before been recognized, viz. change in the relative frequency (due to *some*

sort of selection of heritable features) of variants in a population over generations.[7]

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7. Mayr (2000[1982]), esp. chapter 11 ("The causation of evolution: natural selection"; Mayr, 2000: 477-534),
    provides an excellent analysis of the complexity, depth, and radicalness of Darwin's conceptual innovation.
    Mayr's own characterization of the conceptual status of population thinking (as a theoretical and/or
    methodological approach) has been criticized as "metaphysical" by philosophers of science (cf. Ariew, 2008).
    The extent to which such criticism (if valid) makes a difference for actual explanatory stories seems to me to
    be relatively small, but in any case there is no difference of opinion on the profundity of the conceptual
    innovation.

The conceptual shift from breeding to natural selection was explicit and obvious, and it had the immediate consequence of disconnecting the meaning of the term *evolution* from its etymological root sense of 'unfolding'. But the shift to population thinking in the new concept of evolution, as a previously unknown kind of change, actually has an even more radical effect: not only does it make evolution independent of any agent, it turns it into a process without any preprogrammed end state, unlike the development of an individual organism (from egg to adult). "Populations evolve, individuals are selected", as present day biologists put it; some dinosaurs changed into birds, but no individual dinosaur ever became even a bit more birdlike in its own lifetime – and so on. This had become an indispensable part of the concept for members of the specialist community of biologists (geologists and natural historians at the time), but not so obvious for others. Population thinking is hard, and linguistics turns out to be a case in point.

5. Schleicher – Darwin – Whitney

In 1860, very soon after its original publication, a German translation of the *Origin* appeared. Ernst Häckel, professor of zoology at the university of Jena, sent a copy to his linguist colleague August Schleicher, who was a leading figure in the then blooming research program of Indo-European historical linguistics. Häckel supposed that Schleicher might find it interesting and useful, and it definitely was. In 1863, Schleicher published an essay relating linguistics to Darwinism (translated into English in 1869). Schleicher intended to show that the processes that created languages were of the kind that Darwin had analyzed in *Origin*, and that linguistics thus belonged to the natural sciences. He formulated his main thesis as follows:

> Die Sprachen sind Naturorganismen, die, ohne vom Willen des Menschen bestimmbar zu sein, entstunden, nach bestimmten Gesetzen wuchsen, und sich entwickelten und wiederum altern und absterben; ... (Schleicher, 1863: 6)
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> Languages are organisms of nature; they have never been directed by the will of man; they rose, and developed themselves according to definite laws; they grew old, and died out.[8] (Schleicher, 1869: 20/21)

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8. The English translation given is the one by Bikkers. Note that he does not only change Schleicher's German syntax, but also translates the present tense forms of the last two verbs with past tense forms, reducing the flavor of a general rule, which Schleicher probably intended.

Schleicher uses the term *nature* as immediately linked to the idea that the emergence of a language cannot be determined by human volition. It is in the sense of "nature" as the opposite of "artifact" and "designed" that languages belong to nature (and linguistics to the natural sciences)[9], and this is, of course, completely in the spirit of Darwin. But how about population thinking, Darwin's algorithm? This is not just absent in Schleicher's formulation, it is actually in direct conflict with it. This is clear in his description of the process of change as the kind of development that defines an individual: a development of growing old and dying. The phrase 'definite laws' in this context does not refer to a mechanistic process of change in relative frequencies of variants in a population;[10] on the contrary, it precisely seems to be linked to the idea of a preprogrammed path of development that Darwin dispensed with for the evolution of populations. Similarly, the term *organism* as used by Schleicher fits this equation of change in a population and change in an individual. Consider his description of Darwin's enterprise, following a paragraph on the role of development in individual organisms:

> Darwin und seine Vorgänger gingen nun einen Schritt weiter als die übrigen Zoologen und Botaniker: nicht nur die Individuen haben ein Leben, sondern auch die Arten und Gattungen; auch sie sind allmählich geworden, auch sie sind fortwährenden Veränderungen nach bestimmten Gesetzen unterworfen. (Schleicher 1863: 10)
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> Now Darwin, and those that preceded him, went a step further than the other zoologists and botanists; not only have individuals, said they, a life, but likewise the species and the races; they, as well, have arisen gradually; they, also, are subject to continual changes according to definite laws. (Schleicher, 1869: 28)

Rather than recognizing the difference between individuals and populations, Schleicher equates them. In brief, he has not grasped this crucial component of Darwin's theory at all. This theory was

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9. It is safe to assume that the latter implication was an important reason for Schleicher to be enthusiastic about linking linguistics to Darwin's work, just as much as this was a reason for his opponent Whitney to reject such a link (see below). In fact, the entire debate was predicated on the idea of a supposedly irreducible distinction between "Naturwissenschaften" ("physical sciences") and "Geisteswissenschaften" ("moral sciences"); cf. Alter (2005, ch.6).

10. The only way variation comes up in Schleicher's essay, is in terms of 'varieties', which he equates with dialects, not an individual level concept.

precisely based on the insight that the explanatory causal processes involved are crucially distinct, but Schleicher treats them as two instances of the same process of 'gradual change'. Thus we have a clear case here in the history of science of a misunderstanding that went unnoticed due to differences in semantic networks in different communities of scientists.

As we will see, Schleicher was definitely not the only one having difficulty in grasping this point. But let us first have a look at Darwin's own views.

In 1871, Darwin published his second major work, *The Descent of Man*. In the general introduction to his theory, he devoted a passage to parallels between his approach and insights from historical linguistics:

> The formation of different languages and of distinct species, and the proofs that both have been developed through a gradual process, are curiously the same. [...] We see variability in every tongue, and new words are continually cropping up; but as there is a limit to the powers of the memory, single words, like whole languages, gradually become extinct. As Max Müller has well remarked:—"A struggle for life is constantly going on amongst the words and grammatical forms in each language. The better, the shorter, the easier forms are constantly gaining the upper hand, and they owe their success to their own inherent virtue." To these more important causes of the survival of certain words, mere novelty may, I think, be added; for there is in the mind of man a strong love for slight changes in all things. The survival or preservation of certain favoured words in the struggle for existence is natural selection. (Darwin, 1871: 59-61)

Unsurprisingly, Darwin construes an analogy between languages and species, but since we know that his conception of species is not that of an individual entity, we can safely assume that the same applies to his conception of languages. This is confirmed by his focus on the *items* in a language as being subject to selection, throughout the passage as a whole, and especially at the very end, by his subsuming the preservation of favored words under the rubric of "natural selection". For present day readers this may come a bit as a surprise, as we associate this term very strongly with biological evolutionary theory. But this was not yet the case in Darwin's own time. As mentioned before, the function of the term was to denote non-artificial selection, and that is precisely the impact of Darwin's Müller quote here: words "owe their success to their own inherent

virtue", i.e. the preservation of certain linguistic items is not under intentional control, hence a case of *natural* selection.

In the same year that Darwin published his second major book, William Whitney, professor of Sanskrit and Comparative Philology at Yale, delivered a lecture criticizing Schleicher and rejecting his characterization of languages as organisms. Unfortunately for linguistics, he commits the same error as Schleicher himself, viz. not recognizing the impact of the discovery of a whole new type of processes of change, those consisting in the change of relative frequencies of variants in a population.[11] Consider this passage:

> An egg goes into the hatching-room and comes out a chicken; a bale of cotton goes into the factory and comes out a piece of cloth; there is a palpable analogy between the two cases so far; and there are, beyond all question, laws in plenty, even physical laws, concerned in producing the latter result, as well as the former; but we do not therefore decline to peep inside the factory door, and satisfy ourselves with assuming that the cloth is a purely physical product, and an organism, because the chicken is so. Yet this, in my opinion, is precisely what Schleicher has done. A very little unprejudiced and common-sense research applied to language suffices to show us that the laws under which its so-called life goes on are essentially different from those which determine the development of living organisms, animal or vegetable; they are simply modes of human action. (Whitney, 1872: 49/50)

Paradoxically, Whitney criticizes Schleicher on the basis of the same poor understanding of Darwinian thinking as Schleicher. In one respect, Whitney's is even poorer, as he does not accept the point that language items, in Müller's words cited by Darwin, "owe their success to their own inherent virtue", not to intentional design. Whitney does acknowledge, from the start of his essay, that no individual human being has the power to create a language, but he claims that this does not make language different from projects that require massive cooperation, such a building a pyramid. The characterization of a language that Whitney offered as an alternative to *organism* was that of an *institution*, comprising a set of arbitrary conventions. With this idea, he had an

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11. Perhaps it is sad, for linguistics, that Whitney had not had the opportunity yet to read *The Descent of Man* before formulating his criticism, but it would probably not have made a serious difference. He was also engaged in a controversy with Max Müller (the one cited favorably by Darwin in 1871), that subsequently involved some changes of opinion on both sides (see Alter, 2005), but as far as I can see, he never adopted population thinking.

important influence on Ferdinand de Saussure, and through that, on 20th century linguistics (Joseph, 1988; Falk, 2004). But these concepts were not really elaborated theoretically; in particular, it remained elusive what their origins might be; given the comparison with processes of development or building pyramids, one can only think of goal-directed activities and design, and Whitney in fact explicitly formulated a completely "voluntarist outlook" (Alter, 2005: 138):

> [...] words are neither made, nor altered in form or meaning, nor lost, except by the action of men; whence it would also follow that that congeries of changes which makes up the so-called growth or life of language is produced solely by human action; and that, since human action depends on human will, languages, instead of being undeterminable by the will of man, are determinable by that will, and by nothing else. (Whitney, 1872: 47/48)

For Schleicher, the point that languages are "never directed by the will of man" was sufficient to subsume the field under Darwinism, but by the same token, *not* making a theoretical distinction between populations and individuals, he categorized languages as organisms and continued seeing evolution as similar to development. Whitney actually does the same and *rejects* a Darwinian approach to language for precisely that reason. In everyday language use, the metonymic application of the same term to both categories and category members is very common (cf. *The steam engine has changed the world* vs. *The steam engine has exploded*), but what both Schleicher and Whitney fail to recognize is that this is no longer straightforwardly valid for the term *organism* in the new theoretical framework. A Darwinian approach crucially differentiates between causal processes at these two levels – populations evolve, individuals develop and are selected – so that the senses of a term and the network of conceptual relations they enter into change with the transition to this new approach. It is this fundamental lack of understanding of Darwinian thinking itself that prevented both linguists from seeing the possibility for cultural "phenomena of the third kind" (beyond natural ones and artefacts), as Keller (1994) has noticed.

It was only because of a number of developments in the 20th century that an explicit and consistent theoretical understanding of several cultural phenomena, including languages, as "not directed by the will of man" could be combined with the idea that they come into existence as a consequence of human actions. These include ("evolutionary"!) game theory, Lewis' (1969) theory of convention, the elaboration of "invisible hand explanations" by Hull (1988) and Keller (1994)

(see also Hull, 1997), and the explicitly evolutionary theory of language change in Croft (2000). These approaches all crucially involve the population level. Traffic rules – conventions to keep to a particular side of the road, to give priority to vehicles coming from a particular direction, etc. – gradually come into being, i.e. common use, in a community as a result of various members repeatedly coordinating their choice of trajectories in a particular way and of observing other members doing so. This makes the frequency of a particular coordinative action gradually increase to the point where people start to expect it, and behave accordingly because they know they are expected to use it. Every individual action is goal-directed, but only on this individual level: to continue on one's way, avoid collision, and so on; nobody intends to create traffic rules that hold in a particular community, guiding and constraining the behavior of all individual members alike, and differentiating communities from each other, but they emerge nevertheless, as a consequence of recurring coordinative activities. Such rules are thus not part of nature as their existence is dependent on human action. But neither are they artefacts as they are not the result of design. It is in that sense that they are "phenomena of the third kind": unintended consequences of intentional human actions. Conventional signs and conventional rules of language are another class in this category, and these too are population level phenomena.

It was the lack of understanding of the radical innovation that population thinking implies, that made the whole 'debate' on Darwinism among prominent linguists in the 19th century ultimately fruitless; because certain semantic shifts involved in a new conceptual framework remained unnoticed, linguists were not able to coordinate their thinking and their research using the new toolkit. This may well have contributed, in my view, to inhibiting linguists for more than a century to get a theoretical grip on the relationship between community and individual level aspects of languages, including the historical dimension of this relationship.

6. The Present and the Future

While the 20th century, as mentioned, saw population thinking being applied to cultural phenomena, including languages, in a conceptually consistent way, this kind of thinking and what it entails are still not generally shared in the field. One still encounters, for example, statements to the effect that language change is not an instance of Darwinian evolution but 'only' a metaphor, because languages are not organisms; or, conversely, that since language instantiates Darwin's

algorithm, it must be categorized as an organism – a virus or symbiont (e.g. Van Driem, 2005). In other words, some crucial components of the conceptual innovation have yet to invade the entire population of linguists; this is different from the situation in biology, where one can nowadays not become a new member of this community without a thorough understanding of population level processes as causally distinct from individual level ones. It is therefore useful to mention a few references that can support the further dissemination of the idea.

A valuable, relatively brief account is provided by Dąbrowska (2020). With a variety of quotations from scholars of different schools of thought – including some very recent ones –, she first shows how widespread simplistic one-sided conceptions of language still are; many see it as basically a cognitive mechanism in a person's brain, òr as a technology developed by a community, and even when both the social and cognitive dimensions of the phenomenon are acknowledged, the relation between the two is considered to be a straightforward mapping: individual members' cognitive representations of their language converge on the same grammar. Not only does Dąbrowska show how and why such conceptions are mistaken and misleading, she also demonstrates the existence of significant discrepancies between general regularities at the community level, and the various representations different individuals employ in understanding and producing utterances that as a whole nevertheless conform to the community level regularities. In doing so, she also demonstrates that only by taking differences between processes in populations and in individuals on board, it is possible to explain the whole range of observable linguistic phenomena.

As Dąbrowska states, such an outcome should actually be expected within the usage-based framework, given both the differences in individuals' resources and the different (sub)communities they belong to (see Geeraerts et al., 2010: 4 for a 'predecessor' formulation of this insight). However, this view has only gradually emerged since the time the usage-based program was first explicitly formulated (Langacker, 1988). Initially, it was set up as a program investigating linguistic knowledge as resulting from linguistic experience (experience leaves memory traces, and repeated experience produces entrenchment of cognitive routines), so in a way the radical opposite of a program seeking to establish innate knowledge of language. In Langacker (2008: 19), the need to "ultimately" distinguish between entrenchment (as pertaining to a single speaker) and conventionality (as pertaining to a speech community) was acknowledged,

but only in a footnote, and Langacker still considered "meaning for a single (representative) speaker" the primary object of linguistic semantics.

In the meantime, many practitioners of the usage-based approach had in fact started to incorporate the distinction between the individual level (often labeled "cognition" or "mind") and the population level (often labeled "community", sometimes "society") more systematically.[12] Especially important is the so-called 'Complex Dynamic Systems' (Geeraerts, 2018[2010]) or 'Complex Adaptive Systems' approach (Beckner et al., 2009). Not only does this include the study of both individual and community level phenomena as necessary components of a comprehensive account, it also accounts for the fact that there is no simple, straightforward mapping between regularities at these levels: variability is everywhere.[13] In that respect, they represent a further step forward. But even here, the metonymies introduced with novel theoretical insights are still not recognized fully, and sometimes create (a risk of) misunderstanding (Verhagen, 2021b). Geeraerts includes idiolects, "individual lects", as the smallest type of member in his category of 'lects' (e.g. 2018: 265, 279, 296), and Beckner et al. (2009: 14) state: "Language exists both in individuals (as idiolect) and in the community of users (as communal language)." Thus they consider idiolects and dialects/languages to be phenomena of the same *type*, as is indeed suggested to be the case in everyday speech, when we talk about a person's (e.g. Barack Obama's) "language" when discussing his personal linguistic preferences and habits. But this obscures the fundamental insight that has been introduced with population thinking, viz. the insight that the emergence of conventionality is a community level causal process distinct from the emergence of cognitive units and routines for speaking and understanding – what we call "knowledge of language" – in an individual.

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12. For an outstanding book-length discussion, including an insightful critical discussion with Croft (2000), see Harder (2010). An important dimension of Harder's treatment is his extensive demonstration that the population level dynamics of *linguistic* conventions is just a special case of the social and institutional dynamics of human societies in *general*, thus connecting linguistics to the cultural and social sciences.

13. Note that the individuals and populations mentioned here (and in the rest of this paper) consist of persons. However, the most basic units of replication and selection, in the case of languages, are items (words, constructions), as Darwin suggested, following Müller (see the quotation from 1871 above). A language comprises an inventory of items in use in a community of speakers (cf. Croft, 2000; Harder, 2010; Verhagen, 2021a: 33, 191-194), the "lingueme pool" (Croft, 2000) being distributed over such a community just like a gene pool is distributed over a population of organisms. The difference between the two kinds of individual entities involved in the evolutionary process is important for accounts of actual instances of change, but they are coupled at the population level, the lingueme/gene pool being identified in terms of a population of speakers/organisms. For my general point here – grasping the conceptual difference between population and individual level processes of change – this makes no difference, and I will not further elaborate it.

In Verhagen (2021a: Lecture 2), I argue at some length that the idea that these two notions can be "conflated" – even if meant only temporarily, for certain purposes of analysis or explanation – is untenable if linguistic theory is to be both internally consistent, empirically justifiable, and compatible with general cognitive and biological scientific commitments. Scientific achievements of the 20th century actually make it necessary, for explanatory purposes, to assign the notions 'conventionality' and 'entrenchment' more precise and distinct senses than in everyday life, the former denoting a socio-cultural process, the latter an individual psychological one. This is precisely the main point of the research program that Hans-Jörg Schmid has been developing in recent years, and that culminated in his monograph: Schmid (2020). He uses the metaphor of a Tinguely-machine (a single engine simultaneously driving several different mechanisms, named after the Swiss artist creating such machines) to elucidate how conventionalization – a social-cultural process – and entrenchment – a psychological process – can be kept distinct, while they are both ultimately driven by the process of recurrent usage of signals; cf. Figure 5.
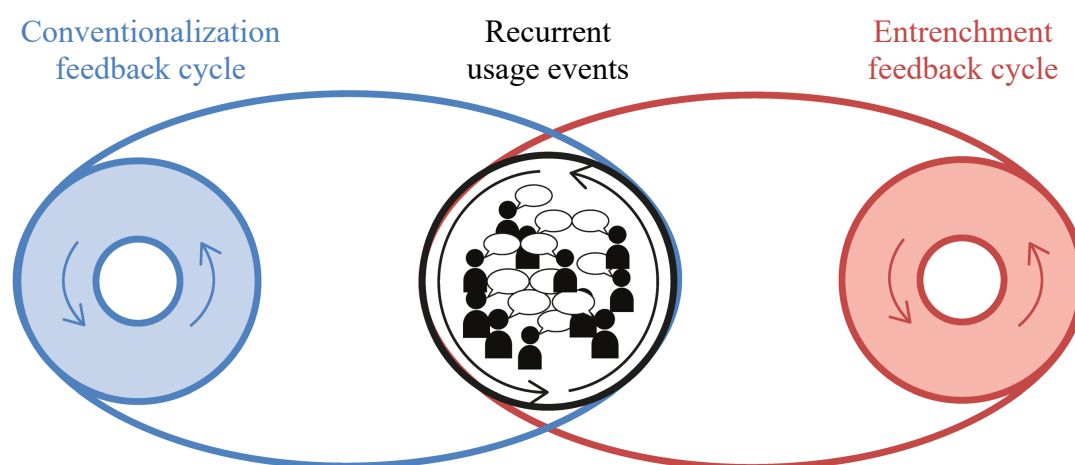

FIGURE 5 The Entrenchment-and-Conventionalization Model (ECM) of Schmid (2020).

In a single individual, repeated activation of language items leads to their entrenchment and also to schematization in the case of partially overlapping items; in turn, such routines and schema's guide production and perception due to their being easily activated. In a community, recurrence of similar interactions between multiple pairs of members leads to expectations about what constitutes effective communicative behavior in that community (which sound patterns to

associate with which concepts), i.e. conventions, which then in turn license the use of these patterns among members. The former consist in habits, the latter have a normative, rule-like character.[14] Individuals form habits, based on experience, which are activated in their interactions with the environment. Only communities of interacting individuals develop conventions that members use for coordinating their behavior. This is why an idiolect is a different *kind* of phenomenon than a dialect or language: it is defined by a set of habits, while a community level language consists in a set of conventions. A particular instance of behavior that deviates from one's habits is not therefore called an error, while it may count as such when it does not conform to a convention. One can make a mistake in using a community's language, not in applying one's personal style.

Note that in developing and elaborating these ideas, we have actually assigned much more precise senses to the terms *convention* and *habit* than a dictionary describing common usage would give. In this framework, they are completely non-synonymous; one can now no longer be used as a component of the semantic description of the other. This loss of flexibility is not to be lamented, though – on the contrary: it is a symptom of progress in theoretical understanding. In fact, with such an improved theoretical understanding, old terminology *becomes* vague and ambiguous, as I argued at the beginning, especially with regard to such terms as *evolution* and *development*. Persisting in the use (metonymically) of such terms for all phenomena that they used to be applied to then becomes an obstacle to fruitful scientific communication and collaboration, i.e. to further scientific progress, which is founded on scientists being able to build on each other's work (Hull, 1988). Accepting increase in precision in the sense of such terms as a necessity inevitably comes with a cost, viz. some discrepancy between the scientific understanding of certain terms and their usage in the communicative practices of the wider community. Obviously, the remedy is not to stick to common usage in the specialist field; what it does require is clarity and explicitness in education, training, and science communication when introducing the specialist insights to young people, novices, and the general public, based on an awareness among

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14. Foolen (2023), also invoking Schmid (2020), insightfully discusses the various senses of, and relations between, the terms such as *habits*, *norms*, *conventions*, and *rules* in relation to the notion of 'linguistic feeling' (German 'Sprachgefühl') in linguistics since the late 18th century. For some of these and other related notions, Lewis's (1969: 83-121) chapter "Convention Contrasted" is also still very useful.

the specialists themselves about the semantic discrepancies, i.e. the differences in conventions between partly overlapping communities.

In linguistics, the full acceptance of population thinking actually requires a radical rethinking of the sense of several fundamental terms, i.e. of the precise nature and status of the concepts denoted by these. In Verhagen (2019) and Verhagen (2021a: 31-37), I identified some of these issues, and suggested ways of resolving them. Let me, by way of conclusion, just invite you to contemplate a single term, viz. *grammar*, and what kind of conceptual innovation of our understanding of grammar is required by this way of thinking.[15] On the one hand, linguists use it to denote regularities in patterns of combinatoriality of linguistic elements in use in a particular community – a population level phenomenon. On the other hand, we also use it to denote a speaker's competence to combine linguistic elements in a meaningful way in the utterances she produces and understands – an individual level phenomenon. As we know from Dąbrowska's work (cf. above), the two types of regularities do not at all have to map onto each other in any straightforward way. They are causally linked, both being driven by the process of language use in interactions, but crucially distinct. A question like "Is grammar cognitively real?" should be abandoned by linguists, not because linguistics is not concerned with cognition (it is), but because the question does not make sense anymore. It invokes an old way of thinking that simply does not allow for a single answer in our present understanding of the causal processes underlying languages and knowledge of language; it is actually as if a question like "What makes the heavenly bodies move through the sky?" would still make sense in astronomy.

Finally, linguistic semantics can find an interesting and important domain of empirical investigation in the polysemies and their evolution in other scientific disciplines, and conceivably

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15. Another, no less important, relevant term in this connection is *meaning*, which is moreover an interesting case as it demonstrates (in two ways!) the crucial importance of conventionality –and thus boundedness to a community. In English, the term exhibits a certain polysemy (based on metonymy), that is absent in in communities of speakers of other languages (including Dutch, German, and French), as different senses of the English term are, in those languages, conventionally signified by distinct terms. Moreover, the polysemy in English and the distinctions marked in other languages are themselves characterizable in terms of the distinction between individual and community level phenomena (Verhagen, 2019: 62). As mentioned in footnote 12, Harder (2010) provides an elaborate discussion of this distinction, and it may therefore be considered somewhat unfortunate that at the beginning of the book, a definition is attempted of a unitary concept of meaning, "so that it becomes clear how that entity can be both in mind and society." (Harder, 2010: 4). It is more useful and coherent to consider an individual speaker's meaning and the community bound meaning of a conventional sign as different –though causally connected– phenomena (Verhagen, 2021a: 34-37).

also support colleagues in other fields to avoid controversies over general issues in these fields that actually have a source in unnoticed metonymies – where these can be shown to play a role.

Acknowledgement

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