# SYNTAX, RECURSION, PRODUCTIVITY –
# A USAGE-BASED PERSPECTIVE
# ON THE EVOLUTION OF GRAMMAR

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> In considering the question of how the human capacity to learn and use grammar could have evolved, a great deal depends on the characterization of the nature of grammar.
>
> Bybee (1998: 249)

> Subjacency [...] manifests itself only in sentences with complex embedding. If our illiterate ancestors had little or no subordination, they would have had little or no need for this UG constraint.
>
> Newmeyer (2002: 372)

## 1. Introduction: specific or general templates?

In recent years, the issue of the origins of human language has clearly been restored as an honorable topic of investigation. After having opposed any evolutionary perspective on the faculty of language for many years (e.g. Chomsky 1975), even Chomsky now not only recognizes that such a perspective is important, but also that it may actually be investigated in a scientific manner (cf. Hauser, Chomsky & Fitch 2002). However, that very paper and the most extensive criticisms of it that have so far been published (Pinker & Jackendoff 2005, Jackendoff & Pinker 2005) also testify to the truth and the topical relevance of the first motto above, an insight formulated by Bybee several years before: a particular view of the nature of grammar, syntax in particular, is a (if not: the) major determinant of answers to the question of language origins that an investigator is at all willing to consider. In asking the evolutionary question how we got from 'there' to 'here', possible answers are constrained and strongly informed by our ideas of what it *is* to be 'here'. In this paper, I want to explore the perspective on grammar offered by the study of patterns in actual language *use*, and the kind of (partial) answers to the question of origins that this suggests, in opposition to some more or less standard assumptions about syntax as part of a language *system*. I will largely be drawing on research that I have been involved in myself.

It is probably a commonplace in linguistic textbooks that an important feature distinguishing human language from animal communication is its open-endedness, and to point to syntax, with its property of recursion, as one, if not the only, source of this productivity ('there is no longest sentence in a language', 'there is no upper limit to the number of sentences in a language', etcetera). So in the case of language, the idea of what it is to be 'here' includes this specific view of essentially recursive syntax and its direct link to linguistic productivity, and this specific view strongly constrains the task assigned to an evolutionary story; the most extreme example of this that I am aware of is the paper by Hauser, Chomsky and Fitch mentioned above, which puts forward the hypothesis that recursion might be the only feature of human language not shared by communication systems of other organisms, nor by other cognitive capacities of humans.[1] But there are other, less extreme examples and to some extent even the approach advocated by Jackendoff and Pinker may also belong here.

What I will do here is show that the study of linguistic usage provides a welcome opportunity to modify this view and its consequences for evolutionary scenario's. In particular, I will use the usage perspective to defend a particular non-uniformitarian view (cf. Newmeyer 2002), in which fully productive abstract syntax (where it exists) is a later development, possibly a result of human cultural rather than genetic evolution, emerging from the combination of analogical and metalinguistic processes which sometimes 'feed back' into linguistic usage.

An important point that Bybee draws attention to is that a considerable part of the linguistic knowledge of speakers consists of partially specified templates. An example is the so-called *way* construction, illustrated in (1)a , and its Dutch counterpart, the *weg* construction, in (1)b (Verhagen 2002, 2003).

(1)     a. She made her way through the crowd.

        b. Zij baande zich een weg door de menigte.

There are good reasons, both from frequency and from processing data, to assume that a template like *to make one's way through something* is stored separately in people's long term memory, and not assembled out of its components on-the-fly every time it is used (cf. the lines numbered 1 in

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[1] See Jackendoff & Pinker 2005 for criticism of some peculiar consequences of the logical structure of this way of describing the task for an evolutionary explanation of language.

Table 1 for a somewhat more precise notation as used by Bybee (1998: 269), with the 'open' slots in the template indicated by means of variables).

**English**

| most specific | 1. | NP$_i$ | *make* | | PRO$_i$'s *way* | *through* X |
|---|---|---|---|---|---|---|
| | 2. | NP$_i$ | [action or motion verb] | | PRO$_i$'s *way* | [directional adjunct] |
| | 3. | NP | V | | NP | Adjunct |
| most general | 4. | NP | VP | | | |

**Dutch**

| most specific | 1. | NP$_i$ | *banen* | | REFL$_i$ | *een weg* | *door* X |
|---|---|---|---|---|---|---|---|
| | 2. | NP$_i$ | [action or motion verb] | | REFL$_i$ | *een weg* | [dir'l adjunct] |
| | 3. | NP | V | | NP | NP | Adjunct |
| most general | 4. | NP | VP | | | | |

Table 1: Schemas at different levels of abstraction or generality

However, an actual expression such as (1) *may* also have been produced on the basis of a somewhat less specific and more schematic template such as the one in line 2 for English in Table 1. That this template is part of the linguistic knowledge of speakers English is evident from the fact that besides the high-frequency default elements *make* and *through*, people also regularly produce a certain variety of other elements, e.g. *She fought her way to the top* or *She elbowed her way out of the room*. In principle, all of these expressions may also be analyzed as instances of even *more* schematic patterns, i.e. those in lines 3 and 4 in Table 1, but Bybee raises considerable doubts as to whether these are ever actually used in producing and interpreting utterances, on the basis of processing considerations.

The case of Dutch is interesting at this point, because we can draw certain conclusions about cognition directly from *linguistic* considerations. Example (1)b illustrates a highly stereotypical instance of the construction in Dutch, accounting for over 50% of the instances of this construction. It contains the verb *banen*, which has the peculiar property that it occurs *only* in this kind of environment (and a closely related one; cf. Verhagen 2003 for details, and 2002 for the historical development), always with the lexically specific object *weg*. This information about this verb simply has to be stored, and this comes down to storing the template of line 1 of the Dutch part of Table 1. Here too, somewhat more schematic templates for such expressions must exist as well, as speakers of Dutch also regularly

produce this pattern with a certain variety of verbs and adjuncts. However, there is clear linguistic evidence in Dutch that *more* abstract patterns than the one in line 2 are *not* underlying the production of such utterances. The point is that the abstract pattern in line 3 does not represent a sufficiently productive schema. If it were productive, we would expect sentences such as (2) and (3) to occur, but they do not and they are also generally judged bad.

(2)   *Hij baande zijn dochtertje een weg door de menigte.

      ('He made his daughter a way through the crowd')

(3)   *Zij smeerde zich een boterham.

      ('She made herself a sandwich')

There is, of course, a perceptible similarity between instances of the Dutch *weg* construction such as (1)b and ditransitive clauses such as *Hij gaf haar een boterham* ('He gave her a sandwich'). But that is all: similarity between independently stored patterns, that are not the product of a single productive, general rule.

   Now consider the possibility that much actual language use can be accounted for in terms of relatively specific, low level patterns that are independently motivated, with little or no need for fully productive general rules. Then full productivity of abstract grammatical rules does not have to be assumed to be necessarily included in the transition from 'proto-language' to ordinary human language. Obviously, this idea cannot be *proven* definitively for every conceivable aspect of the grammars of every human language. So what I will do in order to support it as a plausible possibility, is to focus on two highly prototypical cases of assumed abstract productive processes, both of which allegedly involve recursion of clauses. I chose recursion of *clauses* because the term 'recursion' has recently become somewhat vague, due to some ambiguities in Hauser, Chomsky & Fitch (2002).[2] But everybody at least agrees that embedding

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[2] The linguistic textbook notion of 'recursion' derives from the classical definition given in Chomsky (1965: 142): "The infinite generative capacity of the grammar arises from a particular formal property of these categorial rules, namely that they may introduce the initial symbol S in a line of a derivation [...], this process being iterable without limit." Here, recursion is identical to, in computational terms, a procedure calling itself, or in structural syntactic terms: self-embedding. While Hauser, Chomsky & Fitch continue to evoke a link between 'recursion' and 'infinite generative capacity' –i.e. the sense of 'self-embedding'–, they actually employ a computationally much weaker concept of

one clause in another is a prototype of recursion. Many grammatical phenomena that exhibit some degree of productivity have thus been analyzed as instances of clausal embedding. The first case in point is provided by causative constructions.

## 2. Causative infinitival complements

Causative constructions in English and Dutch are exemplified in (4) and (5), respectively.

(4)   He made me understand the situation.

(5)   *De      sergeant   liet   ons   door      de      modder   kruipen.*
      The    sergeant   let    us    through   the    mud      crawl.
                 'The sergeant had/made us crawl through the mud.'

Many analysts have categorized such constructions as involving embedding of one clause in another, as diagrammed in (4)′ (for a general criticism of this view, see Kemmer & Verhagen 1994).

(4)′   [$_S$ He made [$_S$ me understand the situation ] ]

According to this type of analysis, *me* functions as the subject of *understand*, and the whole event of 'my understanding the situation' is the result caused by the subject of *made* in the causal matrix clause. However, there are several problems with such an analysis (some of which are well known). An important initial observation is that the distribution of such clauses in actual discourse differs in a suspicious way from what one should expect if they were really cases of embedding. In a particular text, in a set of texts belonging to the same genre, and also in a particular corpus, there is a certain ratio of transitive (two participant) and intransitive (one participant) clauses, across both main and subordinate clauses. If causative constructions involve clausal embedding, then on average the same ratio is expected to be observable in the alleged embedded clauses; consequently, the portion of *three* participant causative construction clauses in the whole set of causative clauses should be of more or less the same relative size as that of *two* participant simplex clauses. But this expectation is not at

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'recursion', which is basically identical to the idea of 'hierarchical structure', or 'grouping'.

all fulfilled. Consider the results of counting causative constructions in a corpus of Dutch in Table 2 (reported in Verhagen & Kemmer 1997).

Total number of causative constructions: 855;

a)                              439 with intransitive complement verb;

b)                              416 with a transitive complement verb, of which

    1)     272 without causee;

    2)     144 with explicit causee, of which

        i) 62 as a prepositional phrase;

        ii) 82 as a bare noun phrase.

I.e.:

- causative constructs similar to monotransitive clauses: 90% (a+b1+b2i), of which 7% with a prepositional adjunct (b2i);
- similar to ditransitive clauses: 10% (b2ii).

Table 2: numbers of causative constructions in Dutch Eindhoven Corpus

Depending on how strictly one counts, the portion of three participant causatives is between 10 and 17% (the latter only if one is willing to include prepositional phrases as grammatical subjects of embedded clauses, a rather problematic view that lacks any independent support). In fact, the relative proportions of two and three participant causatives is considerably closer to the ratio of mono- and ditransitive simplex clauses.

There are also other indications that causatives are not a product of syntactic embedding. For example, Coopmans & Everaert (1988) have shown that there is a high number of idiomatic causative expressions in Dutch: *laten barsten*, *laten aanrukken*, *zich laten voorstaan op*, and many others. Given their idiomaticity, they must be stored independently anyway as relatively specific templates of the same level of specificity as in Table 1 for the *way* construction. Given, in turn, the presence of these specific templates, the pattern that captures the similarities between them is, informally, *laten-Verb*, i.e. itself a template of the same level of specificity as line 2 in Table 1. This may safely be assumed to be productive, given the type frequency (number of different elements occurring in the *Verb*-slot), and it suffices to license practically all causative constructions, still without invoking any general rule for embedding one clause (S) into another.

Furthermore, in Kemmer & Verhagen (1994) it is shown that cross-linguistically, the way participants are marked is in accordance with their roles in the *entire* causal event, not with their roles in the different hypothesized clauses. An example from Dutch is (6), in which *aan* marks the

recipient (or 'target' participant), a role that is not provided for by either *laten* or *lezen*, but only by the combination of the two.

(6) *Je    mag    die    brief    aan    niemand    laten    lezen.*
    You    may    that    letter    to    nobody    let    read
            'You must not let anybody read that letter.'

Moreover, we have not found any actual case of recursion of causatives themselves, i.e. sentences like (English) *He let me make John understand the situation*, or (Dutch) *Deze opmerking deed de sergeant ons door de modder laten kruipen*. In fact, these made-up examples are rather bad. In any case, a speaker of the language completely lacking the ability to process such sentences is not at all at a disadvantage.

All in all, this suggests an organization of the grammar of causatives similar to that for the way construction: storage of a number of specific templates, as well as a more general one of *laten* taking verbal complements (see the references cited for additional and more elaborate argumentation). These templates may be retrieved from memory with the open slots to be filled with other material, in order to produce an expression that categorizes some event as involving causation.

This does not, of course, preclude the possibility of perceiving some similarity to *actual* multi-clausal or multi-predicate structures, i.e. of the observation that *me* in example (4) performs a role with respect to *understand* that parallels the role of *I* in the sentence *I understand the situation*, much in the same way as it is not precluded to perceive a similarity between the role of reflexive *zich* in the Dutch *weg* construction and the role of indirect objects in ditransitive clauses, as mentioned above. But the perception of such a similarity is more something associated with meta-linguistic awareness and tasks, than that it plays a role in the ordinary production and interpretation of linguistic utterances.

## 3. *Wh*-extraction in complementation constructions

Another case of apparent recursive embedding with a long standing reputation in the field is what is known as 'long distance *Wh*-movement' or '*Wh*-extraction' from subordinate clauses (the following discussion is based on chapter 3, esp. section 3.3.5, of Verhagen 2005, and on Verhagen forthc.). Examples (7) and (8) stem from Chomsky's (1977) seminal paper on this topic.[3]

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[3] Numbers (32) and (10) in Chomsky 1977, respectively.

(7)   Who did Mary say that John kissed *t*.

(8)   Who did Mary hope [$_{\bar{S}}$ that Tom would tell Bill [$_{\bar{S}}$ that he should visit
      *t* ] ]

Examples of this kind have been considered intriguing and theoretically
important because we seem to have very clear cases here of displacement.
The element *Who* in (7) is the object of *kissed*, but it is not included in
the clause of which *kissed* is the main verb, so it raises a huge processing
challenge: How do language users manage to produce and understand
such sequences, finding out how to interpret elements even if they are not
included in the same unit that determines the role they play in the evoked
event? The challenge is even larger, it seems, when one realizes, in view
of (8), that the number of clauses between the elements to be connected
may be indefinitely large (the phenomenon appears to instantiate true
recursion). This seems to indicate that language users must have very
special capacities enabling them to solve such, at first glance, intractable
computational problems. This is why the phenomenon is felt to be an
almost immediate piece of evidence for innate knowledge of grammatical
structure by those who tend to adhere to the idea of Universal Grammar,
and a challenge for functionalists who do not.

   However, the examples above may be typical for the linguistic literature
–both formalist and functionalist–, they are not for actual linguistic usage.
Actual instances of use that contain apparently displaced *Wh*-elements,
share quite a few other specific properties beyond this. For example, all 6
instances in the Dutch Eindhoven Corpus have the verb *denken* ('think') as
the verb of the main clause, and a second person pronoun as subject, i.e.
reference to the addressee of the question; an example is (9).

(9)   *Hoe   denkt   u     dat    de    AKV-gedachten   in   de   gemeenten*
      How   think   you   that   the   AKV-thoughts    in   the   communities

      *zullen   landen?*
      will     land

      'How do you think the local councils will react to the ideas of the
      AKV?'

Even though this corpus is relatively small (800.000 words), this distrib-
ution is certainly not what would be expected on the basis of the overall
frequency of complement taking verbs and subjects of matrix clauses.
Indeed, the significance of this high degree of lexical and grammatical

specificity of *Wh*-extraction sentences is strongly confirmed when we look at a much larger corpus, in this case a whole year (1995) of the national newspaper *de Volkskrant*.[4] In this corpus, we do find examples with other verbs than *denken*, e.g. *willen* ('want') in (10), and other subjects than second persons, such as *Mayor and Aldermen* in (11).

(10) *Waar    wil    je    dan    dat    ik    het    over    heb?*
Where    want    you    then    that    I    it    about    have
'What do you want me to talk about then?'

(11) *Wat    denken    B en W                dat    onze    burgers    zullen*
What    think    Mayor and Aldermen    that    our    citizens    will

*denken    van    zo'n    dure        buitenlandse    reis?*
think    of    such-a    expensive    foreign    trip

'What do Mayor and Aldermen think that our citizens will feel about such an expensive trip abroad?'

Nevertheless, the verb *denken* and second person subjects are strongly favored. The relevant figures are collected in Tables 3 and 4.

| Tokens/predicate | Predicates (types) | # Tokens: |
|---|---|---|
| 34 | *denken* ('think') | 34 |
| 5 | *willen* ('want to') | 5 |
| 2 | *zeggen* ('say'), *vinden* ('find', 'think') | 4 |
| # Types: | 4 | 43 |

Table 3: Matrix predicates used with *Wh*-extraction in *de Volkskrant* (1995)

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[4] Questions being interactive, one might expect the phenomenon to be practically absent in written discourse, but since journalism contains a lot of representation of discussion (and also interviews), it is actually no less frequent than, for example, several widely used idiomatic expressions. A first pass over the material from the *Corpus Gesproken Nederlands* (*CGN*, 'Corpus of Spoken Dutch') shows that the properties described in the text are observable in spoken language as well.

| Tokens/subject | Subject types | # Tokens: |
|---|---|---|
| 36 | 2nd person pronoun (*je*: 25, u: 10, *jij*: 1) | 36 |
| 3 | 3rd person pronoun (*ze*: 2, *zij*: 1) | 3 |
| 3 | definite noun phrase with lexical head | 3 |
| 1 | 1st person pronoun (*ik*) | 1 |
| | | 43 |

Table 4: Matrix subjects used with *Wh*-extraction in *de Volkskrant* (1995)

Thus, there is clear evidence for the entrenchment of a rather specific template for prototypical '*Wh*-extraction' in Dutch that has the form given in (12).

(12)    [*Wh*...- *denk*- $pron_{2nd}$ *dat*...]

In fact, the position of this template is even stronger than that of the specific pattern *zich een weg banen*, which is the prototype of the Dutch *way* construction (Verhagen 2003), also in view of the fact that the frequencies of the verbs and the subject types differ dramatically from their overall frequency in the corpus, and that the corpus does not contain '*Wh*-extraction' cases that differ from (12) in more than one respect (cf. Verhagen 2005: 124ff, for more data and more discussion). Also, a few of the 7 subjects that are not grammatical second persons, are demonstrably referring to the *addressee* of the question, so conceptually still second persons (including the intriguing single case of a first person matrix subject); for example, (11) was reported to have been uttered by a city council member while addressing Mayor and Aldermen. And as is clear from Table 3, the other verbs that occur in the pattern are all the most basic verbs of communication, volition, and 'opinion' (*vinden*). Thus, the patterns licensing all cases are minimal, less well entrenched, extensions from the prototype template in (12).[5]

Consequently, actual instances of patterns that are usually analyzed as combinations of abstract pieces of structure (i.e. clauses) and involving apparent violations of the boundaries between these abstract structural units, turn out to be produced and understood on the basis of a much more specific template. The lexically specific part *denk je* ('do you think') exactly

[5] Indeed, it is entirely conceivable that some instances of use, at least for some speakers, are direct extensions from the prototype, constructed ad hoc, rather than licensed by independent templates. Of course, this experience, especially if repeated, may constitute the start of a more schematic template.

parallels the part *I think* in the 'complement taking' formulaic templates underlying the first utterances of children resembling complementation structures (Diessel & Tomasello 2001), as well as spontaneous conversation (Thompson 2002). It marks the subjectivity of the person whose mind is being 'put on stage': the speaker's (*I think*) in the case of assertions, the addressee's (*you think*) in the case of questions (Verhagen forthc.). As argued in these studies, the use of such constructs is not the result of combining clausal structures, embedding one in another, but rather of concatenation, hooking up an assertion or a question to an epistemic marker (*I think*, *do you think*). It is only later, with increasing experience, that children extend their competence to more general templates, thus acquiring the ability to use patterns similar to these ones but a bit more variable, to represent other people's mental states and processes, sometimes even as events that they are contemplating and presenting to others for consideration. But as Thompson (2002) has convincingly shown, this does not undo the formulaic, non-embedding character of the apparent complementation constructs that constitute normal use in spontaneous conversation by adults.

## 4. Conclusion

We have now considered evidence from usage for several stored templates with a rather high degree of specificity, which constitute the collection of low level schema's (cf. level 1 in Table 1) in a network of specific and more general schema's. The evidence indicates that the most general patterns (or 'rules') are often not involved in actual production or processing, but without precluding the perception of similarities to other patterns in he same network. In certain circumstances, such a perceived similarity may itself become a productive rule. In the case of complementation, for example, I feel that the suggestion by Newmeyer (2002) that general clausal subordination only became an important component of grammar with the development of literacy, is a plausible one. In fact, I think this should be taken even more seriously than what Newmeyer suggests, in the sense that abstract subordination is likely to be a result of cultural rather than genetic evolution. While practically all adult speakers of present day Dutch or English do not not have an abstract rule at their disposal for *Wh*-extraction, they certainly do use a *highly schematic* template for producing and understanding assertive complementation constructs, both in view of corpus data and experimental evidence (Verhagen 2005: chapter 3; Dąbrowska 2004: chapter 9). Diessel & Tomasello (2001) have shown

that by age 5, children have not yet mastered the network of complemen-
tation constructions in general. They only make this transition when the
type frequency of complement taking verbs in their linguistic experience
increases drastically, and this happens in the process of learning to read
and write.[6]

The kind of full-scale productivity of syntax as manifested in some
adult native speakers' judgments about *possible* sentences differs substan-
tially from what we encounter in normal usage, i.e. from productivity
as observed in *actual* utterances. This allows for the conclusion that the
evolution of a cognitive system with less than fully productive abstract
syntax suffices for linguistic behavior as we actually still encounter it 'in
the wild'. Consequently, recursive combinatoriality of abstract structures
is not a prerequisite for an organism to use real, actual language and
benefit from its advantages in order to survive and reproduce. A cogni-
tive system with only limited grammatical productivity, consisting in the
capacity to combine relatively specific templates with expressions to fill
their open slots, is indistinguishable from a fluent speaker of a human
language. Thus, from a usage point of view, there has not been an advan-
tage for a genetic trait providing a specific linguistic innate capacity for
abstract structural syntax, and such a trait (even if it ever arose), would
have been diluted in the gene pool rather than selected for.

Full productivity of general patterns ('rules') is a result, especially man-
ifest in metalinguistic tasks, rather than a necessary condition for normal
language. I already mentioned the likely connection with literacy, requir-
ing metalinguistic awareness, in the case of complementation for adult
speakers of languages like modern Dutch and English. Linguists, profes-
sionally looking for systematic connections among the parts in the linguis-
tic toolkits of speakers of a language, are another case in point. Using the
general human capacity for abstraction and generalization, they may see
similarities between different parts (e.g. between the causee of a causative
construction and the subject of a finite clause, as discussed in section 2),
and sometimes mistakenly assume that these are indicative of the oper-
ation of underlying abstract rules, thereby ascribing more complicated
capacities to language users than necessary, and complicating the task of
providing an evolutionary scenario for the emergence of language. The
usage-based perspective, on the other hand, clearly makes this task more
manageable. We still have to assume considerable memory capacities,

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[6] Cf. Bybee (1995) for the basic idea about the connection between type frequency and
productivity in the domain of morphology, and Croft & Cruse (2004, chapter 11) for an
extension to the domain of syntax.

imitation capacities, pattern recognition, and fast working mechanisms for reliably producing and understanding speech, but we have to assume those anyway. For example, in order for the type frequency of words used in a particular pattern to increase to the extent that the pattern may become a productive rule (as in the case of complement taking verbs in modern literate societies), it must be possible to indefinitely expand the lexicon with new elements; the basis for this kind of (non-syntactic) productivity is the property of languages know as 'double articulation' or 'duality of patterning' (Martinet 1949, Hockett 1958). Given the biological evolution of this specific capacity, allowing an indefinitely large lexicon (cf. Nowak et al. 1999), given general capacities for categorization and schematization, and given the capacity to combine templates, grammatical patterns for subordination are bound to arise when the type frequency in a particular spot in a pattern increases as a result of a cultural change such as the development of writing and especially its spreading through the population. Thus a theory of language evolution does not have to account for full syntactic productivity at all levels of schematicity as emerging at the same time and by similar mechanisms as other features of language, such as double articulation.

## Epilogue

In adopting a usage perspective, I have essentially adopted a population definition of a language (cf. Croft 2000), viz. as a collection of utterances (actual linguistic usage events), and then tried to establish some properties of cognitive systems and their development that should be assumed in order to explain recurrent properties of the utterances (not necessarily all of them). This is crucially different from adopting a set theoretical view of language, defining it as a set of sentences (possible rather than actual linguistic constructs), and then trying to establish properties of systems accounting for properties of members of the set (all of them). The former is analogous to the population view of the concept 'species' in biology, the latter to the essentialist view, which requires one to specify a definite set of rules for determining which cases belong to the set and which do not (in the case of language: to distinguish between the 'grammatical' sentences, whether actually used or not, and the 'ungrammatical' ones, whether actually used or not). As is well known, the latter view has been dominant in modern linguistics since at least 1957, to such an extent that the possibility of a coherent different view could not even be envisaged. But the essentialist view requires a theoretical specification of the notions 'possible sentence' and 'possible human language', which may be

as impossible as the task of theoretically specifying the notions 'possible species' or 'possible animal' in biology. Explaining recurrent properties of actual organisms and actual utterances is hard enough, and maintaining that the essentialist view must somehow be right may turn out to be more and more like a pre-scientific intuition about how the world múst be organized. For evolutionary questions, it is clearly becoming more and more useful to take the population view seriously. The evolution of the capacity for acquiring and using language may seem practically a miracle under the essentialist view, and at least considerably less so in the population view, i.e. the usage-based perspective.

Evolutionary linguistics comes in more than one shape. Kortlandt (1985) initiated a line of thought in which evolutionary thinking inspires the conception of a population of linguistic units (especially their meanings) internal to humans as competing for representation in the brain. The position that I have explored here takes an 'external' perspective, viewing a language as a population of utterances, i.e. signals (although crucially related to unobservable interpretations, for otherwise they would not be signals but rather sounds, or lines). The two views may well be compatible, just like an evolutionary conception of the immune system or the structure of the brain can and should be connected to an evolutionary conception of the organisms in which these systems are properly contained. The observation in Kortlandt (2003) that the most successful groups of neurons are those that are associated with the most frequently stimulated peripheral locations (presumably, of the body, in particular the sensory organs) provides an obvious starting point for a consideration of possible connections between the 'internal' and the 'external' views, given the equally important role of frequency of use in the discussion above, especially if we allow for one or more 'layers' of indirectness between sensory experience and neural representation. A special issue to be explored is the connection between linguistic meanings and their use for the purpose of influencing conspecifics, i.e. for managing and assessing others, rather than to the outside world as such (cf. Verhagen 2005, chapter 1). But that exploration I happily leave for a future occasion.

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# REFERENCES

Bybee, Joan
  1995        "Regular morphology and the lexicon". *Language and Cognitive Processes* 10, 425-455.
  1998        "A functionalist approach to grammar and its evolution". *Evolution of Communication* 2, 249-278.

Chomsky, Noam
  1965        *Aspects of the Theory of Syntax*. Cambridge, MA: The MIT Press.
  1975        *Reflections on Language*. New York: Pantheon.
  1977        "On wh-movement". In: Peter W. Culicover, Thomas Wasow, Adrian Akmajian (eds.), *Formal Syntax*, 71-132. New York, etc.: Academic Press.

Coopmans, Peter, & Martin Everaert
  1988        "The simplex structure of complex idioms: The morphological status of *laten*". In: Martin Everaert, Arnold Evers, Riny Huybregts, Mieke Trommelen (eds.), *Morphology and Modularity. In honour of Henk Schultink*, 95-104. Dordrecht: Foris.

Croft, William
  2000        *Explaining Language Change. An Evolutionary Approach.* London, etc.: Longman.

Croft, William, & D. Alan Cruse
  2004        *Cognitive Linguistics*. Cambridge: Cambridge University Press.

Dąbrowska, Ewa
  2004        *Language, Mind, and Brain: Some Psychological and Neurological Constraints on Theories of Grammar*. Edinburgh: Edinburgh University Press.

Diessel, Holger, & Michael Tomasello
  2001        "The acquisition of finite complement clauses in English: A corpus-based analysis". *Cognitive Linguistics* 12, 97-141.

Hauser, Marc D., Noam Chomsky, W. Tecumseh Fitch
  2002        "The faculty of language: What is it, who has it, and how did it evolve?" *Science* 298: 1569-1579.

Hockett, Charles F.
  1958        *A Course in Modern Linguistics*. New York: The Macmillan Company.

Jackendoff, Ray, & Steven Pinker
  2005        "The nature of the language faculty and its implications for evolution of language (Reply to Fitch, Hauser, and Chomsky)". *Cognition* 97: 211-225.

Kemmer, Suzanne, & Arie Verhagen
  1994        "The grammar of causatives and the conceptual structure of events". *Cognitive Linguistics* 5, 115-156.

Kortlandt, Frederik
  1985        "A parasitological view of non-constructible sets". In: Ursula Pieper & Gerhard Stickel (eds.), *Studia linguistica diachronica et synchronica: Werner Winter, sexagenario anno MCMLXXXIII gratis animis ab eius collegis, amicis discipulisque oblata*, 477-483. Berlin: Mouton.
  2003        "The origin and nature of the linguistic parasite". In: Brigitte Bauer & Georges-Jean Pinault (eds.), *Language in time and space: A festschrift for*

*Werner Winter on the occasion of his 80th birthday*, 241-244. Berlin: Mouton de Gruyter.

Martinet, André
  1949        "La double articulation linguistique". *Travaux du Cercle Linguistique de Copenhague* V (Recherches Structurales 1949), 30-37.

Newmeyer, Frederick J.
  2002        "Uniformitarian assumptions and language evolution research". In: Alison Wray (ed.), *The Transition to Language*, 359-375. Oxford: Oxford University Press.

Nowak, Martin A., David C. Krakauer & Andreas Dress
  1999        "An error limit for the evolution of language". *Proceedings of the Royal Society of London* B 266, 2131-2136.

Pinker, Steven, & Ray Jackendoff
  2005        "The faculty of language: what's special about it?" *Cognition* 95, 201-236.

Thompson, Sandra A.
  2002        ""Object complements" and conversation: towards a realistic account". *Studies in Language* 26, 125-164.

Verhagen, Arie
  2002        "From parts to wholes and back again". *Cognitive Linguistics* 13, 403-439.
  2003        "The Dutch *way*". In: Arie Verhagen & Jeroen van de Weijer (eds.), *Usage-Based Approaches to Dutch*, 27-57. Utrecht: LOT.
  2005        *Constructions of Intersubjectivity. Discourse, Syntax, and Cognition.* Oxford: Oxford University Press.
  forthc.     "On subjectivity and 'long distance *Wh*-movement'". In: Angeliki Athanasiadou, Costas Canakis & Bert Cornillie (eds.), *Subjectification: Various Paths to Subjectivity*. Berlin/New York: Mouton de Gruyter.

Verhagen, Arie, & Suzanne Kemmer
  1997        "Interaction and causation: causative constructions in modern standard Dutch". *Journal of Pragmatics* 27, 61-82.