The conception of constructions as complex signs

Emergence of structure and reduction to usage*

Arie Verhagen
Leiden University Centre for Linguistics

Generally, construction based approaches to grammar consider constructions to be pairings of form and meaning and thus as a kind of signs, not essentially distinct from words and other lexical items. Granting this commonality, Langacker (2005) criticizes other varieties of constructional approaches for using the notion 'grammatical form', and for not reducing the properties of grammar to the more fundamental and minimal notions of sound, meaning, and symbolic links between these two. While such a reduction is definitely worth pursuing, if only for reasons of general scientific interest, the abstract forms postulated in Cognitive Grammar (schematic sound patterns) are so general that they represent 'any sound', which threatens the very basis for the assumption that constructions are a kind of signs. I will argue that a usage-based view of sign-formation (Keller 1998), allows us to understand how the recognition of an element as belonging to a particular class of elementary signs can come to function as a signal for a specific linguistic environment (a construction), and produce a level of structure (categories of more elementary signs and relations between them) intermediate

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between sound and meaning that has its own (emergent) properties, which can still be reduced to more basic phenomena of processing and language use.

1. Introduction

All theories of grammar adhering to the idea that constructions are the basic units of grammatical analysis, explicitly draw the consequence that the sharp Bloomfieldian distinction between lexicon and syntax is mistaken. Rather, there is a gradual continuum of linguistic units ranging from 100% phonologically specified, via partly schematic, to phonologically abstract ones; at one end of the continuum, there are the traditional lexical items (prototypically words and morphemes, also fixed phrases), and at the other end are the traditional rules of grammar, but it is not possible to indicate in any principled way where the point is at which the lexicon ends and the grammar begins. As words are, practically by definition, pairings of some phonetic shape with some function, it does not come as a surprise that many, if not most, constructional approaches to grammar also consider more abstract and/or more complex constructions as *signs*, pairing some form to some function. There are certainly exceptions to this rule (Jackendoff 2002, Culicover & Jackendoff 2005: 537/8), and as this difference is theoretically important, I will return to their specific position in the conclusions, but even these take the status of a Saussurean 'sign' for constructions to be at least the stereotypical case.

Within the large group of constructional approaches that do share the assumption that all constructions are pairings of form and function, there are still a number of differences, and some of these involve the notion 'sign', as being applied to multi-unit constructions and thus construed as complex. Langacker (2005) explicitly compares three of these varieties: Construction Grammar (CG, Goldberg 1995), Radical Construction Grammar (RCG, Croft 2001), and his own theory, Cognitive Grammar (CogG). While these approaches agree that constructions are signs, they differ, according to Langacker, in that CG and RCG characterize the form of a construction in terms of 'syntactic' or 'grammatical' notions, whereas CogG equates the formal side of constructional signs with phonological form, with the addition that there may be schematic forms, just like there may be schematic meanings.

It is this issue that I want to take up in this paper. First I will recapitulate Langacker's criticism of the positions of Goldberg and Croft, concluding that he has definitely uncovered a serious problem. But I will then go on to argue that his own characterization of the formal side of constructional signs actually does not solve this problem either, for principled reasons. Thus it turns out that we are left with a serious lack of understanding how the concept of 'sign' applies to abstract,

schematic constructions, while at the same time it is often intuitively clear what this means in particular cases. In order to address this issue, I turn to the general theory of signs, in particular the variant proposed in Keller (1998), which is at the same time a theory about the structure of signs, about the formation of signs, and about the connection between structure and use of signs. Two features of this approach turn out to be especially fruitful for an application to the problem at hand: the recognition of different types of 'techniques' for interpreting phenomena taken to be signs, some of which are more elementary than others (in a sense to be explained), and the idea that processes of sign formation may apply to their own 'output', adding interpretive possibilities to signs once they exist. An extension of these ideas to constructions will allow us to construe a notion of 'complex sign' that solves both the problems that Langacker (2005) points out for CG and RCG, as well as those that his own approach meets. To put it briefly: in terms of linguistic *structure*, some level of form mediating between sound and meaning in the specification of constructions (in any case all schematic ones), has an important role to play, and is an indispensible independent part of the architecture of grammar; but in terms of *processes*, no more is involved than the elementary capacities of processing sound and conceptual content, and of using signs. Finally, I argue that the resulting conception of 'construction as a sign' entails the need to recognize the relevance of some version of the traditional structuralist notion of 'paradigm'. Even though there is a need for some level of 'grammatical form' in the specification of constructions, the characterization of this level is still reducible to more elementary processes and elements of sign formation and interpretation, and the notion 'paradigm' plays a role in this reduction.

2. The notion of 'form' in constructional grammatical theory

2.1 Langacker's critique of Croft and Goldberg

Having observed that the three varieties of construction grammar he discusses share many fundamental views and concepts, Langacker (2005) states that "this commonality conceals a fundamental point of non-agreement":[1]

> This point of non-agreement concerns what is meant by form. In Cognitive Grammar […] the form in a form–meaning pairing is specifically phonological structure. […] [C]rucially, it does not include what might be called grammatical form. In both Construction Grammar and Radical Construction grammar, the form

1. To which he adds: "I say non-agreement instead of disagreement because Goldberg and Croft appear not to even be aware of it, so they can hardly be said to disagree."

> part of a form–meaning pairing does include grammatical form. Thus Goldberg (1995: 51) speaks of "a pairing between a semantic level and a syntactic level of grammatical functions". More explicitly, Croft (2001: 62) says that a construction is symbolic by virtue of being "a pairing of a morphosyntactic structure with a semantic structure". (Langacker 2005: 104/5).

Langacker depicts the difference by means of the picture in Figure 1.

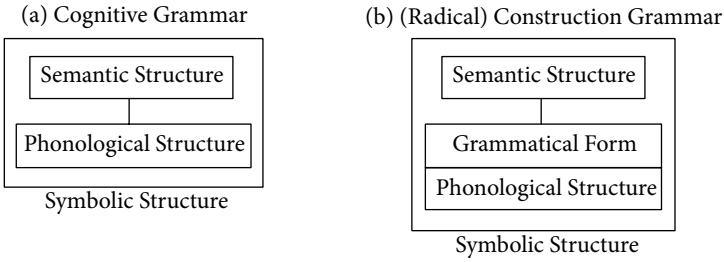

Figure 1. Different concepts of 'form' in Cognitive Grammar and in (Radical) Construction Grammar.

In fact, a three-level model of grammar as depicted in (b) seems to be the default in constructional approaches (broadly conceived). Most of the time it is simply assumed without much explicit discussion, sometimes it is explicitly turned into a crucial design feature of the architecture of the language faculty (Jackendoff 2002). But Langacker presents a number of good grounds for taking a critical stance towards such three-level models. First of all he gives a number of positive reasons why view (a) is attractive:

> Reducing a complex phenomenon to something more fundamental is inherently interesting because it provides a deeper level of understanding. It is further interesting on grounds of theoretical parsimony. Semantic structures, phonological structures, and symbolic links between them are the minimum needed for language to serve its communicative function. Cognitive Grammar is thus maximally austere in claiming that only these elements are necessary. Finally, the reduction is interesting because the resulting view is so natural. (Langacker 2005: 106).[2]

Moreover, there are two 'negative' reasons to prefer view (a) of Figure 1 over view (b), viz. problematic aspects of the latter. For one thing, there is a risk of circularity in view (b):

2. Langacker explicitly remarks that view (a) does not imply that grammar "does not exist", but that the phenomena subsumed under "grammar" can be reduced to properties inherent in constellations of symbolic structures, i.e. sound-meaning pairings. However, I will argue that there is also a more active role, beyond existing, to be played by grammatical regularities.

> There is also something less than straightforward about saying that grammar resides in constructions, defined as form–meaning pairings, and also saying that certain aspects of grammar constitute a major part of the form. (Langacker 2005: 107).

The relevance of this point can be illustrated by means of an example from more recent work by Goldberg (2005). She represents the Caused Motion Construction (instantiated by the now famous example *sneeze the foam off the cappuccino*) in the schematic way given in Figure 2.

Form	**Meaning**
Subj V Obj $Obl_{path/loc}$	X causes Y to move $Z_{path/loc}$

Figure 2. Caused Motion Construction in Goldberg (2005: 73)

Even granted that this is meant to be an informal representation, the question must be raised in what sense the specification "path/loc" of the Oblique phrase on the form-side of the construction really is a matter of form; after all, 'path' and 'location' actually look much more like conceptual than formal notions. Moreover, the same specification also appears on the meaning-side, which also undermines the idea that Figure 2 actually represents a sign.

Besides the risk of circularity, Langacker also notes:

> There is something inherently obscure about the notion grammatical form, at least as it pertains to category membership and grammatical relations. In what sense, for instance, is categorization as a noun a matter of form? Category labels do not appear in the speech stream, and since ordinary speakers have no conscious awareness of grammatical classes or class membership, the latter can hardly be said to have a symbolizing function. (*ibid.*).

Even if conscious awareness may not be the relevant point (speakers normally have no awareness of phonological properties like voicing either, while this may nevertheless distinguish two signs for them), this comment raises a very important point about the notion 'form', that is rarely discussed in theoretical grammatical work, viz. its role to 'trigger' the recognition of a sign by being immediately accessible to the processing system, i.e. as a percept.

For example, consider the representations for the ditransitive construction in CG and RCG in Figure 3.

In order for the grammatical relations to play the role implied for them in Figure 3(a), they must somehow be independently specifiable, and the same holds for the grammatical classes (syntactic categories) in Figure 3(b). Identifying the form-side in signs of this kind as a "syntactic level of grammatical functions" (Goldberg), or "morphosyntactic structure" (Croft) raises the question what the

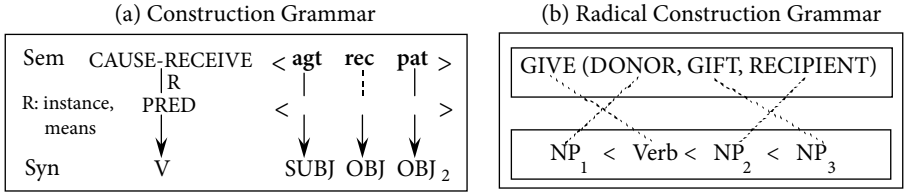

Figure 3. The ditransitive construction in CG and RCG

characteristics of this level of representation are, and where they come from, and may introduce unwarranted complexity:

> To the extent that these constructs are not reduced to anything more fundamental, they represent a vestige in these frameworks of strong autonomy, in the form of a special set of irreducible grammatical primitives. The virtues of a full reduction, spelled out above, are therefore eschewed. (Langacker, *ibid.*).

That is, the answer to the question on the nature of 'grammatical form' might quickly be some kind of irreducible theory of syntax, invoking completely independent principles and notions ('grammatical primitives') — just like phonology, a theory about the sound structure of a language, specifies the properties of sound (features of segments and constraints on combining them, pitch accents and pitch levels, syllable structure, etc.) independently of what such phonological properties signify. Precisely this analogy has been used by Jackendoff in his work on a constructional theory of grammar, from the beginning till the present (cf. Jackendoff 1996: 98ff, Jackendoff 2002, Culicover & Jackendoff 2005), to suggest that autonomous syntax should be scientifically perfectly acceptable. However, Langacker's position is obviously to be preferred from a general scientific point of view; sound, conceptualization and the capacity to link them, are the minimum for language, and separate levels of irreducible structure and/or capacities beyond these require independent motivation at the least. In any case, the conceptualization of the notion of 'form' in constructions apparently bears directly on one of the most controversial issues in modern linguistics: that of the presumed autonomy of syntax. One of the ways for Langacker to prevent the risk of falling into the trap of autonomous syntax as well as the risks of circularity and incoherence, is to exclude a level of 'grammatical form' from the specification of a construction, and while I think this point is itself untenable, the grounds on which it is based are important and basically sound, and I will try to incorporate them in a different way into the proposal to be developed in the course of this paper. The issues Langacker raises are, indeed, important conceptual issues that *must* be addressed if we are to develop the constructional approach into a consistent theoretical framework. On the other hand, it is not a priori clear that they are ultimately as problematic as he suggests. I hope to show, in particular, that the question in the quotation above (i.e.: in what sense

is categorization a matter of form?) does not have to be taken as a rhetorical one, and that there actually is an interesting answer to it that also avoids the risk of circularity as well as irreducible syntax.[3] But first it is important to demonstrate that it is really necessary to search for such answers, i.e. to show that the alternative of 'schematic forms' also runs into conceptual problems.

2.2 Problems with 'schematic forms'

The point is that we can and should ask similar questions about the concept of 'schematic forms' as can be raised about 'grammatical forms': what exactly is their status, and how can a schematic form have a symbolizing function? To see what is at stake, consider the way Langacker introduces the notion of 'schematic form' for composite symbolic structures. First, consider the non-schematic composite structure in Figure 4.

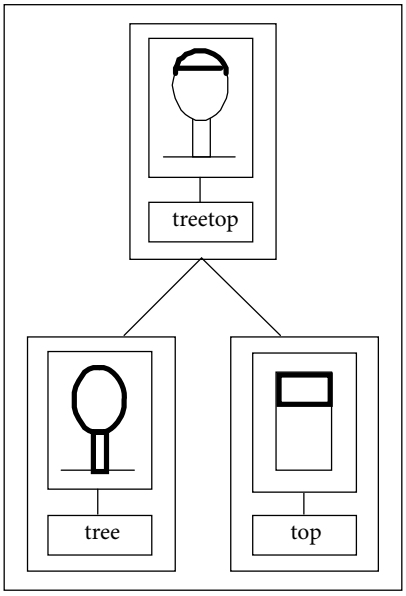

Figure 4. A specific composite structure

3. Langacker distinguishes between strong and weak autonomy. The former, as indicated in the text, is the assumption that a theory of grammar needs irreducible grammatical principles and primitives, the latter "is simply the claim that grammar cannot be fully predicted from meaning and other independent factors (e.g. communicative constraints). It therefore has to be explicitly described as such" (Langacker 2005: 103). Langacker endorses this weak view of autonomy, but rejects the strong form, claiming that a (weakly autonomous) description of grammatical structure only needs phonological and conceptual structures (and links between them) to be formulated.

Each of the syllables *tree* and *top* is the form of a symbolic structure, as is the composite sound structure *treetop* (assuming it to be conventionalized in the speech community). There is a generalization to be made over these and numerous other expressions of this kind ('nouns'): they denote a particular part or aspect — a (metaphorical) 'bounded region' — as being set off against some background in which it intrinsically belongs — in a 'domain'. The standard representation Langacker gives to characterize nouns is given in Figure 5.

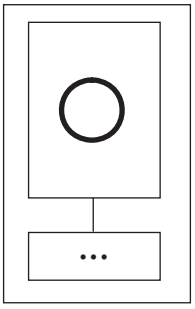

Figure 5. The schematic representation of nouns in CogG

In fact, this already suffices to identify a problem. Notice that the formal side of this schematic symbolic structure is *completely* abstract, and the phonological generalization over all nouns in English will obviously *have* to be. Thus, Figure 5 says that any (phonologically well-formed) combination of sounds can indicate a nominal concept, and of course this is precisely what it should say. But in what sense could Figure 5 *itself* be called a sign? In what sense can 'any sound' have a symbolizing function? The point is that for a percept to function as a signal, a minimal requirement is that it is distinct from other percepts, and 'any sound' does not satisfy that criterion.

A conceivable way out is not to consider Figure 5 as having the status of a sign itself, but as only capturing the generalization over the forms and meanings of all nouns.[4] This would amount to taking the position that what characterizes nouns

4. Langacker (p. c.) states that he deliberately speaks of constructions as "symbolic structures", not "signs", to indicate that they are abstract and not directly observable. This may come close to opting for the way out I mentioned here. However, as I indicate in the text, that would in my mind also amount to a serious loss in the explanatory power of the constructional approach, precisely because at least some schematic grammatical patterns truly function as signs, since they provide an independent contribution to the meaning of expressions. I therefore continue to consider abstract symbolic structures as a kind of signs. Notice that Langacker (2005: 106), cited above, includes phonological structures in the minimum needed for language "to serve its communicative function", and that in order to be of use in communication, sounds must be cognitively accessible (see Section 3 for elaboration). Elsewhere, Langacker (2008: 5) defines "a symbol as the pairing between a semantic structure and a phonological structure, such that one

as a class is only the semantics, not the form. However, it is clear that this option is not available as a general solution, because at least some composite symbolic structures *have* to have the status of independent signs; this is the case where such structures exhibit *productivity*.[5] For example, compounds like *treetop* can also be assembled out of the existing elements *tree* and *top*, and the structure licensing this may be represented as in Figure 6.

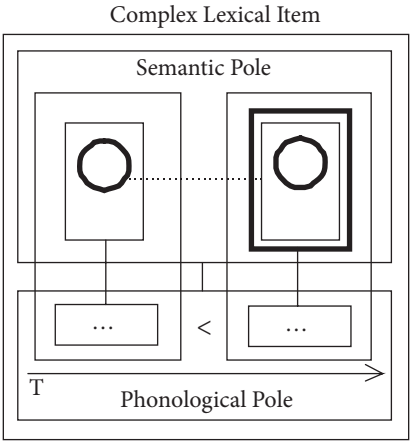

Figure 6. A schematic composite symbolic structure in CogG

What this captures is that the second of two nouns in a complex lexical item is the 'head' of the whole (indicated by the box in bold — a treetop is a kind of top, not a kind of tree), whereas the first one provides the domain in which the 'head' is profiled. In that way the schema provides its own contribution to the meaning of an instantiating expression, and thus should be considered as a sign, like a word or a morpheme contributing to the meaning of an instantiating expression. Notice that the contents of the phonological pole has to be fully unspecified here as well; only the temporal aspect of the stream of speech ("T") is indicated, but since the contents of the preceding and the following elements are identical (both being empty), the indication of order actually does not make the form any more distinct from any other (if A = B then A < B is the same as B < A). As noted above, we

is able to *evoke* [my emphasis] the other", and it is a prerequisite for a phonological structure to be able to evoke something, that it be both accessible and distinguishable from other phonological structures.

5. Productivity in the sense of licensing novel expressions when being combined with words is obviously something that applies especially to grammatical patterns, not to words, while the latter are also signs, of course. But in the case of a construction, productivity is decisive evidence for the construction contributing its own meaning to an instantiating expression, hence for its status as a sign (cf. below).

cannot restrict the status of a schema as in Figure 6 to a descriptive generalization; since it is productive, it must itself be considered as a sign, the function of which is actually not so hard to specify.

Similar comments apply to the representation of the ditransitive construction given in Figure 7.

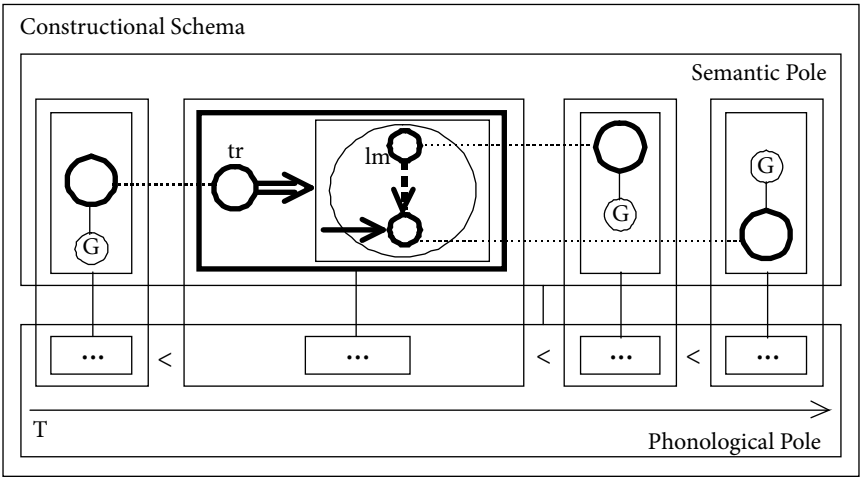

Figure 7. The representation of the ditransitive construction in CogG

In Langacker's (2005: 112) words:

> The trajector exerts some kind of force (double arrow), thus inducing something to move (solid arrow) into the landmark's sphere of control (ellipse), so that this recipient then has access to it (dashed arrow). The box enclosing the verb's semantic pole is given in bold to indicate that the verb functions as profile determinant (or head), i.e. its profile is inherited at the composite structure level. The other three component symbolic structures are all noun phrases, serving to specify central participants of the verbal process.

Like Figure 6, this is composed of symbolic structures, and at the same time it is itself a symbolic structure, indicated by the vertical line connecting the two big boxes called "Phonological Pole" and "Semantic Pole", respectively. And it must have the full status of a sign as it can be used productively, to license novel expressions of transfer, also with verbs like *kick* (as in *She kicked him the ball*) that do not themselves evoke the conceptual structure of Figure 7; in other words, it can independently contribute to the meaning of an expression that instantiates the construction. And as will be clear, here too, the phonological pole is empty, and thus cannot distinguish this sign from another. For example, the phonological poles of Figure 6 and Figure 7 are actually identical, so this cannot be how the two constructions can be distinguished from each other. So, it is true that

the CogG characterization in Figure 6 avoids the objections that can legitimately be raised against the ones in Figure 3, since it does not invoke the 'obscure' notion of grammatical form; but it turns out that this approach still does not provide a satisfactory conceptualization of what it means for a construction to be a sign either.

A related problem caused by the non-distinctness of completely abstract phonological poles of complex signs is that it undermines the status of the abstract categories thus defined as *linguistic* ones. For example, take the simple case of the representation of the category 'noun' in Figure 5. As a result of the phonology being unspecified, what distinguishes the category depicted in Figure 5 from any other one is only its *conceptual* specification. Thus, this in effect provides a purely conceptual characterization of the category 'noun'. But then it cannot be distinguished from any arbitrarily defined concept; given that language, by definition, is meaning linked to form, a category is only (also) a category *of language* if it is, in one way or another, systematically related to aspects of form. So if a category can be related to any form, it becomes unclear, to say the least, if there is a systematic link between meaning and form for this category.[6]

Moreover, this position seems to imply that a category like 'noun' is universal and language independent, and the same holds in practice for many other ones: given the need to generalize over all possible phonological poles of members of categories, many purported categories will exhibit a fully unspecified phonological pole.[7] This consequence is problematic in view of the way general grammatical categories and relations can be defined and recognized, as has been demonstrated convincingly by Croft (2001, ch.1). The point is that a general syntactic notion, such as a part of speech, has to be defined in terms of a shared set of 'constructional environments' in which elements instantiating the purported notion occur. In English, for example, criteria for calling something a proper noun as opposed to a common noun, and both of these nouns, involve differences and similarities in the constructions that members of each class can felicitously occur in (allowing/requiring/disallowing the use of an article, a relative clause, adjectival modification, etc.). Criteria to distinguish subject and object relations in English involve such things as agreement and order, again, aspects of the constructional

6. An alternative, somewhat relaxed version of the criterion that linguistic categories must be systematically related to forms, is to say that a category must enter into the explanation of the *distribution* of forms. But notice that this in turn undermines the idea that only aspects of *sound* structure function as the form of a schematic sign. As a matter of fact, though, this will in a certain sense be a part of the solution I will propose.

7. In fact, Langacker (2005: 114, 128, i.a.) quite explicitly treats 'noun' and 'verb' as conceptually defined universal categories. Cf. also Chapter 4 of Langacker (2008).

environments of elements. Thus, as Croft argues, constructions are the primitives of syntactic theory (even though they are not atomic).

Now the problem arises because constructions are language specific, and well known not to be universal, and thus all general notions defined in terms of them are necessarily language specific as well. Therefore, universal conceptual definitions of grammatical notions are problematic as a matter of principle, not just as a matter of fact, given the dependence of general notions on characteristics of constructions and the well known diversity of constructions between as well as within languages.[8]

It turns out then that we still do not have a clear and consistent conception of what it means for a grammatical construction to have the status of a sign, despite the fact that it is intuitively unproblematic in many cases to agree that a construction is similar to a lexical item, in the same way as an idiom is similar to a lexical item. Thus some further conceptual clarification of what it means for any phenomenon to function as a sign appears to be potentially useful. To this end, let us now turn to sign theory.

3. A usage-based conception of signs

3.1 Inferential techniques, symptoms, icons, and symbols

The version of sign theory that I will take as the starting point for the discussion is the one proposed in Keller (1998). The reason I chose this one is that it provides the best case that I know of an approach taking a truly usage-based view. Most importantly (as we shall see), Keller distinguishes between different kinds of signs, not on the basis of allegedly different kinds of relationships between signs and their meanings, but on the basis of different kinds of procedures and different

8. Consequently, notions like 'noun-in-English', 'noun-in-German', 'subject-in-English', 'subject-in-German' etc. are definable in terms of the constructions of English and German, respectively, but they cannot be viewed as subcategories of universally defined linguistic notions 'noun' or 'subject'. Rather, the latter should be taken as a Wittgensteinian 'family resemblance' concepts. The fact that certain cross-linguistic generalizations may be formulated in terms of properties of 'nounhood', 'subjecthood', etc., must be explained in terms of the generality of basic human experiences, general communicative functions that languages serve, etc., providing a basis for parallel processes of grammaticalization in distinct languages — a linguistic counterpart of convergent evolution in biology. Conceivably, there might exist a conceptual space within which all actual (language specific) nouns can be located, but such a conceptual space would not, of course, itself be the meaning of a symbolic structure. Langacker (2008: 95–98), partly in response to Croft (2001), presents a largely similar view, though without envisaging the latter consequence and its corollaries, as far as I can see.

kinds of knowledge employed by humans in their use of signs.[9] This is not only an aspect that makes Keller's approach consistent with the usage-based conception of grammar being adopted here, but it will also turn out to supply a basis to deal with the problems discussed in the previous section.

In general, according to this view, signs are phenomena occurring in the environment of humans, that they employ for interpretation, basically using no more than three different types of inferential capacities, and inferential techniques based on these capacities. The most elementary kind can be illustrated as follows. Imagine hearing the sound of which Figure 8 gives the sonogram.

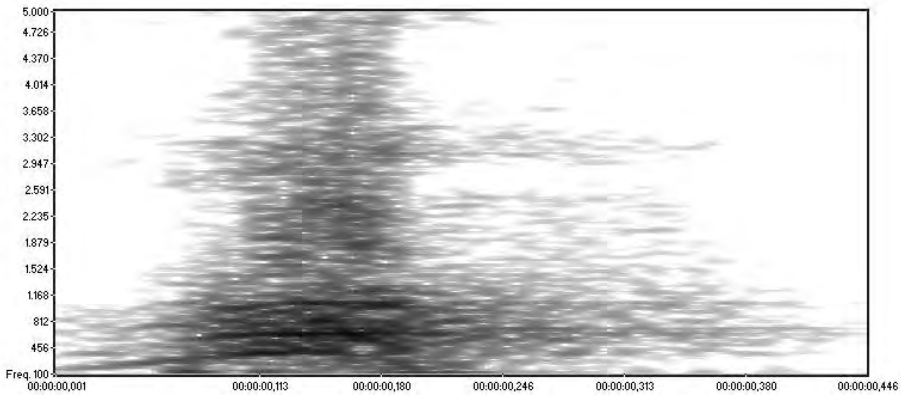

Figure 8. Sonogram of a dog barking

This may allow one to infer the presence of a dog on the premises, and possibly also some of its characteristics. By virtue of being used for interpretation in this way, the barking sound functions as a sign for a dog (with some particular characteristics). The basis for this inference is causal knowledge. Only if one knows that sounds like this are produced by dogs, does it make sense to interpret the phenomenon in this particular way. Other examples of phenomena of the same kind are seeing smoke and inferring fire, or observing someone yawn in the theater and inferring that he is bored.

If the capacity used to interpret some observable phenomenon is knowledge of causality, then Keller calls the signs involved "symptoms". Such phenomena are not intended as signs; we can say that smoke is a sign of fire, for instance, and then

9. Perhaps somewhat paradoxically, Keller explicitly opposes a cognitive view of meaning in one chapter of his book, while nevertheless providing the original German version (Keller 1995) with the subtitle "On a theory of semiotic knowledge"(*Zu einer Theorie semiotischen Wissens*). I suspect, however, that Keller's intention is especially to discredit a private, (non-shared) view of knowledge of meaning (with which I agree entirely), rather than the view *per se* that adult humans, also as individuals, know the meaning of linguistic items.

we don't mean that the smoke had been intentionally produced in order to signal the presence of fire (or whatever) to some observer.

Now imagine visually observing Figure 9 on a fence.

Figure 9. Picture of dog

This may also allow one to infer the presence of a dog on the premises, and possibly some of its characteristics. But in this case, the basis for this interpretation is not causal knowledge about dogs. There is no causal connection between this kind of picture and dogs or their behavior. Rather, it is our ability to associate the actual visual perception with crucial characteristics of dogs that is the basis for the inference here. In general, such an association boils down to the *experience* of some kind of similarity between the observed and the inferred phenomena. But as Keller (1998: 108ff) stresses, similarity as such is not the defining criterion: a painting of a castle is more similar to other paintings than to any castle, but it can nevertheless function as a representation of a castle (rather than of other pictures), and it is the possibility of evoking the relevant association that counts.

If the technique of interpretation consists of this sort of association, then Keller calls the signs involved "icons". Typical other examples are pointing arrows and figurative traffic signs. Notice that these kind of phenomena must be taken to be *intended* as signs in order to function in this way. When I see a configuration of clouds in the sky that looks like a dog's head, I am not justified to make any inferences about actual dogs, or things having to do with actual dogs. When I see the picture of Figure 9 lying on the ground next to the fence, as part of a torn photograph, I have good indications that it was not intentionally put there to signal the presence of a dog, so although the similarity is exactly the same, I don't take it as a sign.

Finally, imagine seeing the marks in Figure 10 on a fence (say, when traveling in China).

小心犬只

Figure 10. Some Mandarin characters

Again, this may allow one to infer the presence of a dog on the premises, and possibly some of its characteristics. In this case, it is neither causal knowledge nor general associative capacities that constitute the basis for this interpretation. Rather, it is knowledge of certain *rules*, viz. conventions in a community for the use of certain configurations of visual stimuli, that allow the perception of these stimuli to be used (i.e. if you know the rules) as the basis for an inference. Another example is the one in Figure 11.

Figure 11. Some English characters

As a matter of fact, this allows for the same inferences as Figure 10, but the conventions for using visual markings to signal something in the community of speakers of English obviously differ from those in the community of speakers of Mandarin.

If the capacity allowing the interpretation of some observed phenomenon is knowledge of a conventional rule, then the sign involved is called a "symbol". Linguistic symbols are a prime example, but non-linguistic cases also exist, of course, e.g. (in certain countries) a red triangle pointing downwards to indicate to drivers on a secondary road that they are approaching an intersection with a main road.

This three way distinction between types of signs is, of course, reminiscent of Peirce's classical distinction between index, icon, and symbol. There are also differences, but these have less to do with the demarcation of the different classes of signs than with the conceptualization of their nature (see Keller 1998: 105–113 for some discussion). A characteristic feature of Keller's approach is that the distinctions are based on the kinds of techniques used in interpretation (which is one reason why I called this approach usage-based), and not formulated in terms of the nature of the relationship between the signifier and whatever it is taken to denote. This has advantages, as Keller demonstrates, for giving an adequate account of sign dynamics, especially semantic change over historical time. But the same feature is also useful for our present problem.

The interesting point about focusing on the technique of interpretation in sign-usage, is that these very same techniques can be applied to sign phenomena themselves, giving rise to a considerable complexity of relationships between signals and their ultimate interpretation, without the need to invoke more than these three basic mechanisms for interpretation. As a preliminary example, recall that yawning can be taken ('used for interpretation') as a sign (i.e. a symptom) of boredom, on the basis of one's knowledge about a causal connection between the two. Imagine now that we are acquaintances and I see you sitting a few rows further

during a break in the show, and you want to communicate that you are bored. One way to achieve this goal is to *stage* a yawn: display behavior that is easily recognizable as a yawn, but also clearly as staging (e.g. through exaggeration). First, I can see the similarity between your behavior and a real yawn, allowing me, by the associative technique, to infer that you want me to think of a real yawn; second, I can take this idea of a yawn, using the causal knowledge technique, as a basis for the inference that you are bored. In that way, you have effectively *communicated* (i.e. intentionally signaled) to me that you are bored. Using the associative technique in this way, you have *exploited* my capacity to make causal inferences for communication, and in the process, a symptom of boredom has been transformed into an icon of boredom (cf. Keller 1998: 143–148).

In this way, a new sign has been created, on the fly, so to speak, and it is more complex than the most basic ones discussed so far, as it involves two steps. Now imagine, for the sake of the argument, that this particular kind of signaling is repeated, between a smaller or larger group of individuals; then it will become a regularity, in this group, to signal boredom in this way, and ultimately, a convention, i.e. the rule that we, in this group, follow and *expect* each other to follow, for the use of this particular gesture. It is especially easy for this kind of shift to occur in groups of *humans*, given our special skills in intersubjectivity:[10] we are good at recognizing intentions of others, and when we recognize the intention with which a sign is being produced, we readily infer that we may use the same sign, in the relevant community, when we have a similar intention; thus the regularities of usage, including recognized intentions, easily become the meaning of the sign. It has then become a *symbol*, and the associative technique that was originally necessary for interpretation, no longer is, so that the form of the gesture can be reduced, for example, as long as it is recognized as an instance of the relevant symbolic behavior.[11] The sign has become simpler, then, but its technique of interpretation differs from the original one.

It is also possible to exploit the associative technique itself. The picture in Figure 12 was used for many decades in the 20th century by a Dutch insurance company.

First of all, by the associative technique, it can make you think of an umbrella, and the umbrella — as a means of protection against the rain — may, also by association, in turn make you think of protection in another, less physical sense. In the

10. Cf. Zlatev et al. (2008). For the fundamental nature of the capacity for intersubjectivity in understanding the acquisition of meaning, cf. Tomasello (2000, 2003), and for its impact on language structure, Verhagen (2005, 2008).

11. But notice that it is not necessary for all individuals at the same time to use the *same* technique of interpretation for the sign to function successfully in communication. This is precisely why this approach is useful in accounting for gradual semantic change.

Figure 12. Exploitation of associative technique

same way as with exploitation of the causal inferencing technique, over time, with repetition, the use of this particular means of evoking the idea of protection can become a regularity in a community. Even when umbrella's in the Netherlands no longer looked like the one in this picture, the picture as a whole still was capable of evoking this idea, simply because it was known to be in use for this purpose in the community. Ultimately, this kind of use may of course also develop into a convention, although it does not have to.

Now, once symbols are in use in a community, these may, of course, also be used as the *first* step in the creation of new signs. Instead of staging a yawn, you might also produce a conventional symbol for this idea, e.g. utter the syllable *yawn*, and then rely on my causal inferencing capacities to do the rest and make me conclude that you are bored. Or an advertisement for the insurance company may, instead of a picture, use the conventional word *umbrella* to make people think of an instrument for protection against rain, and then rely on their associative capacities to do the rest.[12] The point is: if a convention is really well established in a community, then you may just as well trust people to think of a yawn or an umbrella when using symbols for these notions as when using symptoms or icons (all of them as starting points for further causal or associative inferences). For practical purposes, the entrenchment of a convention makes the meaning of a conventional symbol in a community as cognitively accessible for one's addressee as a percept. The same kind of reasoning as used above leads to the insight that with repeated use over time, the new uses of the sounds *yawn* and *umbrella* may (though need not) become regularities and ultimately rules for conveying the concepts of boredom

12. The first kind of phenomenon is known in semantics as metonymy, the second as metaphor (cf. a sentence like *This policy provides an umbrella against financial risks*).

and protection, respectively, with the intervening steps no longer being necessary. When that has happened, the words simply (also) *mean* 'boredom' and 'protection', and we say that semantic change has occurred.

3.2 Consequences for the notion of 'form'

The insight that the same basic techniques of interpretation for signs can also operate on the 'output' of signs, so to speak, also has consequences for the concept of the 'form' of signs. Consider the cases of the words *yawn* to indicate boredom and *umbrella* to indicate protection. From the point of view of the ultimate interpretations, it is the *concept* 'yawn' and the *concept* 'umbrella' that function to trigger the interpretations of boredom and protection, respectively. So in that sense, the concepts 'yawn' and 'umbrella' perform the same role as a directly observable form does in a simple sign.

What this brings to light, is that when applied to signs, the notion 'form' is actually two-sided: on the one hand, it refers to what is observable in a sign, on the other, it means 'what triggers the inference of something unobservable'. Given the possibility to apply techniques of sign interpretation to their own output, what we can now say is that these two aspects of 'form' do not have to coincide, they are not necessarily coupled. The sound *umbrella* can give rise to the idea 'umbrella' (symbolic technique), and this *in turn* to the idea 'protection' (iconic technique), so it is not the observable acoustic phenomenon (represented in writing as *umbrella*) that directly produces the inference 'protection'.

So there is a fundamental ambiguity in the term 'form' when used in talking about signs. What I hypothesize is that it is this ambiguity, the fact that it has hardly been noticed, and certainly not fully thought through, that lies at the heart of the conceptual problems discussed in Section 2. The consequence of the insight that elementary techniques of sign interpretation can be applied to their own output is that the distinction between 'sound' and 'meaning' (the 'phonological pole' and the 'semantic pole') does not coincide with the distinction between 'signifier' and 'signified'.

Moreover, we have also seen that the procedures for linking signifier to signified can be of more than one kind, also within one (complex) sign. This is something that may easily remain obscured when talking indiscriminately about this connection as a "symbolic link", or "a pairing of form and meaning". There are lexical items in which meaning and form are linked via more than one technique, such as onomatopoeia and 'standard metaphors'; these both employ the associative and the conventional technique, i.e. several resources to arrive at a useful interpretation, with the additional advantage that the conventionality makes it less necessary to produce a relatively accurate representation to be communicatively successful

than when one would solely rely on the iconic technique.[13] But this insight is actually even more useful in the domain of syntax, where, as we have seen, the notion of form is especially problematic.

4. Form–meaning-relations in constructions revisited

4.1 Extending the theory to composite signs

The basic sign theory exposed in the previous section allows us to take a fresh look at the issue of the meaning of constructions, and ask what exactly it is that this may be said to be signified by, and how, and whether this fits into this conceptual framework in a natural way. Let us take the ditransitive construction as an example. At the semantic side, there is essentially agreement that this construction denotes an event involving transfer (cf. Section 2). Could we say, for example, that this is an interpretation based on causal knowledge, given the presence of three participants in a single event? As a matter of fact, we straightforwardly could, since an act of transfer necessarily involves at least three participants. Thus the presence of three participants may be taken as a symptom of an event of transfer.

Could some associative technique also play a role? What would be a non-causal way of associating the presentation of an event as involving three participants with an event of transfer? The one that comes to mind is, I think, actually better described as a regularity of use: previous linguistic experience may have made it clear that in communication, events of transfer and three participants strongly correlate, so that a new utterance with three participants is classified as a case of transfer on the basis of similarity to these other, previously encountered cases.

Could it also be a matter of convention that three participant events are events of transfer? In other words: Is it also a *rule* (of English) to use a three participant frame in this way, i.e. essentially in the same way as it is a matter of convention that the sound shape *give* is a signal for events of transfer? Minimally, I would say that this would then come *on top of* the 'motivatedness' of the construction in terms of causal knowledge. Moreover, it is certainly not the case that the presence of three *nominals* (i.e. the recognition of three different expressions as belonging to the class of noun phrases) conventionally signifies that we have to think of an event of transfer. In a sentence like *They declared Bush the winner*, there are three nominals (*They*, *Bush*, and *the winner*), and the sentence is OK, but it does not express an event of transfer, certainly not one in which Bush is the receiver of an object called *the winner*.

13. As for onomatopoeia, this explains why the words for *cuckoo*, the sound of a rooster, etc. are actually quite different across languages.

On the other hand, it is true that the use of certain three participant frames can force a transfer interpretation upon a verb that does not conventionally denote such an event itself, as in *They fixed Bush a tour of the country*. This sort of behavior has precisely been used to support the idea of a separate status of constructions alongside standard lexical items, and thus for the symbolic status of constructional schema's (Goldberg 1995; see also Section 2.2 above). But notice that although both *the winner* and *a tour of the country* are instances of nominal phrases, they differ in certain respects, which may very well be crucial for the difference between the two kinds of constructions. Most particularly, *the winner* indicates an animate entity, and *a tour of the country* an inanimate one. Assuming that *Bush* denotes an animate entity, this makes it impossible for the second expression to be predicated of *Bush*, which may practically leave the interpretation as transfer as the only sensible option. As this formulation shows, this still does not imply that it is a *convention* in English to associate a pattern of two animate and one inanimate noun phrases with an event of transfer — it may very well be taken as only symptomatic or iconic. But at the very least it does show that the pattern giving rise (via whatever technique) to the transfer-interpretation is more specific than the quite abstract 'three noun phrases'.

At the same time, these considerations show that recognition of an element as belonging to a certain class (e.g. denoting an inanimate entity) can function to (help) trigger a further interpretation (denoting an object of transfer), and in that sense have a signaling function; it is itself evoked by the recognition of certain sounds as denoting certain nominal concepts, but this pattern may subsequently function as a signifier. Now recall Langacker's question, cited in Section 2.1., "In what sense […] is categorization as a noun a matter of form?", and his assertion that class membership cannot really have "a symbolizing function". In the light of the discussion so far, we may now formulate the response that categorization can certainly function to signify a further aspect of interpretation, i.e. to be, *in some particular sense* (viz. the second one in terms of the ambiguity exposed above: 'signifier'), a matter of form, viz. in being cognitively (highly) accessible and thereby capable of being used to license a further aspect of interpretation. As a matter of fact, this is just a manifestation in language (use) of the general role of categorization in human as well as non-human cognition: A concrete percept (say a striped figure of a certain size) being categorized as a tiger allows an organism to make certain predictions about its possible behavior, make inferences about appropriate actions, etc..

In the case of constructions, much more so than in the case of words, the link between a phenomenon used as a sign and its interpretation will often not be fully conventional, but (also) symptomatic and/or iconic. In the way the term 'symbol' is used in sign theory, class membership will often not have a strictly 'symbolizing'

function (i.e. not solely based on knowledge of a convention), but it may easily have a 'signaling' function, and in that sense constitute the form part of a 'form–meaning pairing', or rather (less paradoxically), the signifier part of a signifier–meaning-pairing. To what extent conventionality plays a role in such links is then entirely a matter for empirical research to decide, although it is absolutely clear that conventionality does play a role at this level — constructions certainly cannot be reduced to motivated signals in general. For example, consider the fact that (present-day) English practically requires the use of *way* in the so-called *way* construction (Goldberg 1996), and Dutch the word *weg* in its cognate (Verhagen 2003); even if these elements are not entirely unmotivated in this construction, it is (now) a convention (greatly enhancing the reliability of the constructional sign) to use this rather than something else that could, in principle, license the same kind of inferences (e.g. *path* or *road*) based solely on the causal and associative techniques of sign interpretation. Or consider the relatively higher degree of conventionality in the Dutch translation equivalent of the English so-called TIME-*away* construction (Jackendoff 1997): a prefix *ver-* applied to transitive verbs. Especially historical and comparative research can be very helpful in bringing to light both what the non-conventional origins of constructions have been, and also what the balance between conventionality and motivation is for each particular case (cf. Verhagen 2007, for the examples just mentioned and a few other ones). Thus I am not denying that there are conventional signifier-meaning pairings in the case of constructions, on the contrary. What I do want to emphasize at this point is that especially in the case of constructions, it is important to see that, first, there are more ways for 'meanings' to be paired to 'forms/signifiers' than by symbolization, and second, that the *meanings* of percepts can themselves be the trigger of further aspects of interpretation, and thus function as signifiers next to and on top of percepts. Another way of formulating exactly the same point is to say that the relationship between a construction and its constituent parts can be a metonymic one (such as parts functioning as signals for a whole), and at least partly motivated.

4.2 The role of the notion 'paradigm' in constructional signs

As noted in the previous section, categorization may actually be considered 'a matter of form' viz. when it is practically as cognitively accessible as a percept and is used to create a further inferential interpretation. The (partly) schematized linguistic elements in the representations of typical constructions indicate categories, so it is clear that everyone at least implicitly agrees that categories have a role to play in an adequate characterization of constructions. That makes it useful to pay special attention to the role of class membership as a possible part of the specification of form in a construction.

Knowing a construction involves (i.a.) knowing what kinds of elements fit into the construction's open slots. In other words, it involves knowing something about the characteristic *distribution* of certain elements: at least all elements one has ever encountered in the same constructional environment belong to the *class being defined by this slot* (and also elements that are sufficiently similar to them in relevant respects, if the type frequency is high enough for the category to become productive, cf. Bybee 1985). It is knowledge of this relationship that precisely allows class membership to function as a trigger (together with other triggers in typical cases) for a typical environment in which it may occur, i.e. to function as an aspect of the form of a construction. Thus, what is meant by saying that class membership can function as an aspect of form and have a symbolizing function, is that the recognition of a particular element as belonging to the class that fits a particular 'slot' of a construction contributes to the recognition of the construction. In particular, an element's belonging to a class defined by a slot of a construction may at least be taken as a (weaker or stronger) *symptom* of the presence of the construction, as we have seen.

The notion of a class of elements defined by their potential to occur in a slot of a construction is the traditional structuralist notion of a 'paradigm'. This notion is indeed indispensable in a comprehensive theory of grammatical constructions. Consider, for example, the 'expressive binominal construction' occurring in a number of Germanic and Romance languages (Foolen 2004; the description to follow is especially based on Paardekooper 1956). The Dutch and English versions contain three 'slots' that may contain variable elements, besides two (almost: see below) completely fixed ones (*of a*), as indicated in Table 1.

Table 1. Paradigms in the expressive binominal construction

an	*angel*	*of*	*a*	*child*
this	*bear*	*of*	*a*	*man*
1	2	3	4	5

The special nature of this pattern and one of the reasons to consider it a separate grammatical construction consist in the fact that expressions that conform to it denote a special kind of entity indicated by the final noun (i.e. a child that is like an angel, a man who is like a bear, etc.); i.e. the final noun is the 'head' — not the first one, as the general rules for noun phrases with possessive phrases in these languages would otherwise dictate (cf. *a coat of a child*, *this voice of a man*, *a convention of a language*).[14] Moreover, the first noun expresses an evaluation (possibly

14. That is, it imposes a certain structure on the meaning of the expression (cf. the nominal compounding construction illustrated by Figure 6 in Section 2.2). Another structural, 'syntag-

a negative one: cf. *our handkerchief of a lawn*) of some aspect that is emotionally relevant to the speech participants.

It is part of the characterization of the construction that the content of element 3 is completely fixed, while the other positions are variable, albeit to different degrees. The content of element 4 is also virtually fixed, as it has to be either the indefinite article *a* or nothing at all (in the case of plural nominals), i.e. a neutral marker of indefiniteness (a determiner like *some* is disallowed). The classes of elements that may felicitously occur in the slots 1, 2, and 5 constitute the paradigms of the construction. In position 1, essentially all determiners may occur, except for the one with the least specific meaning, the default identifier *the*.[15] Position 2 may contain nouns that must express concepts representing an extreme value on some scale (relevant to the dimension in which the referent is being evaluated). In position 5, finally, basically any nominal concept can appear. The first two paradigms are rather specific for this construction, the first one negative (the occurrence of *the* excludes the possibility of interpreting the pattern involved as a case of this construction), the second one positive (the easier and/or more conventional it is to interpret this concept as an extreme value on a scale, the more likely it is that we have an instance of the construction). By definition, no single element that satisfies the criteria for one of these slots suffices to trigger the recognition of the whole construction, but a combination may well be enough, especially a combination of the first three slots. Notice that the criteria for class membership are specifically semantic, i.e. it is a combination of certain semantic characteristics (more-than-identifying determiner, extreme value of a scalar concept) that licenses the inference of other semantic characteristics: the evaluative, expressive meaning of the construction. As such the former satisfy the criterion to be considered the form-part of the construction, even though they are not themselves part of the speech stream, but rather semantic themselves — but as we have seen in Section 2, this is not special at all, but actually quite normal in sign usage.

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matic' rather than paradigmatic, aspect of the construction is that the two nominals (elements in slots 2 and 5) must agree in number. The form-side of the construction is thus not exhaustively specified by the slots and their linear sequence alone: agreement between slots 2 and 5 is another constraint that must be satisfied for the recognition of the construction to be licensed. This kind of information will thus also have to be allowed for in the specification of constructions, but I will not elaborate that point here.

15. As Paardekooper (1956) suggests, this may very well be motivated by the fact that the purely identifying function of the default determiner does not go well with the emotional-evaluative meaning of the construction, although it is very well conceivable in principle that the latter might override the former (so the fact that this is not the case in Dutch may still be seen as a convention of the language).

Notice that a fully abstract representation, using only the most generally recognized parts of speech, would not suffice: something like *Det-N-of-a-N* would not be able to distinguish this construction from the general pattern licensing 'ordinary' possessive noun phrases. On the other hand, the phonology is also insufficient to distinguish the expressive binominal construction from the ordinary pattern. Thus, this construction by itself already shows the need to characterize the 'form' of a construction — in the sense of 'what makes the construction recognizable' — in other terms than more or less schematic phonology. Rather, we have a combination of phonological structures (*of*, *a*/zero) and paradigms jointly serving to define a pattern that evokes a specific meaning, which demonstrates the usefulness of the notion 'paradigm' in characterizing the form of constructions; that a paradigm is sometimes (partly) defined in semantic terms (cf. 'scale', 'evaluation' in this example) is no problem from the point of view of sign theory; on the contrary, it is what one should expect as a normal case.

So it is certainly possible, in fact natural, to reconstruct 'class membership' as an abstract aspect of form signaling some aspect of meaning. It is less clear whether the notion of a grammatical relation such as Subject or Object might also be construed in such a way (as suggested in Goldberg's work; cf. Section 2.1). If the language involved has a case system, they will presumably reduce to the meanings of the relevant markings (say Nominative and Accusative), which usually are distributional-semantic paradigms themselves.[16] In a language like English, on the other hand, they may in fact also reduce to paradigms, e.g. the one defined by the nominal slot in the verbal agreement construction and/or a certain position in a series of noun phrases. Since paradigms and the possibility of ordering them appear to be indispensable for a proper characterization of the form of constructions anyway, I conclude, at least tentatively, that abstract grammatical relations should not be seen as independent elements of the possible forms of constructions (unlike Construction Grammar — cf. the difference with Radical Construction Grammar depicted in Figure 3), and will henceforth only consider paradigms (possibly ordered).[17]

16. Usually, a case is not uniquely marked by a single phonological form, but by a (small) set of sound shapes, the actual choice of which correlates with a distributional-semantic class; cf. the nominative case endings in Latin [*-us*, *-a*, *-is/es*, etc.], depending on the 'declination class' of the noun and sometimes also on the sound shape and/or other features. Notice that this actually is the original context of the term 'paradigm' (a model word such as *rosa*, representing the class taking a phonologically specified set of endings).

17. As remarked by a reviewer, grammatical relations also seem to be hard to use at all for the specification of other constructions than the argument structure constructions of the kind discussed by Goldberg. It is hard to see what the form-part of relative clause or focusing constructions, for example, should look like in terms of grammatical relations. In fact, Verhagen

4.3 Reconceptualizing the structure of complex signs

Recall the illustration given by Langacker (2005) of the difference between Cognitive Grammar and (Radical) Construction Grammar in terms of what they recognize as 'form' (Figure 1, repeated here for convenience).

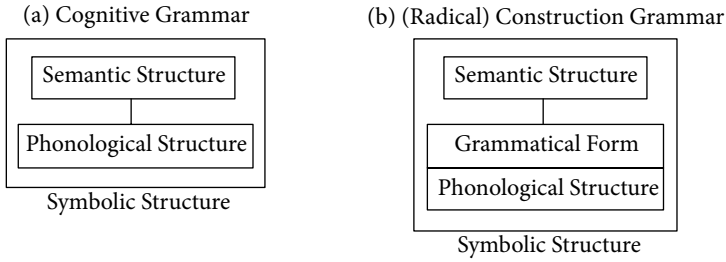

Figure 1. Different concepts of 'form' in Cognitive Grammar and in (Radical) Construction Grammar.

In retrospect, given our discussion so far, we may conclude that this way of representing the two views is perhaps somewhat misleading, or at least that it simplifies matters too much. This way of construing the difference suggests that 'grammatical forms' as assumed in Figure 1(b) should be identifiable in a way that is totally independent of conceptual and communicative considerations; construed in that way, grammatical forms are indeed an obscure kind of phenomenon, that should indeed be dispensed with, if possible. But we have seen that not only percepts (forms in the sense of observable phenomena) can trigger sign interpretation; readily accessible concepts can also trigger such inferences, *on the basis of the very same techniques of interpretation as simple signs*. Moreover, we have seen that schematic phonological structure cannot play the role that is suggested it should play according to Figure 1(a), so *some* sort of intermediate structure between real phonological structures and the meaning of a construction will definitely be needed. What the preceding discussion has made clear is that constructions should indeed be thought of as comprising more than one 'layer' of links between signifiers and 'signifieds', as depicted roughly in Figure 1(c):

(2005, ch.3) specifically argues that analyzing complementation constructions in terms of grammatical relations impedes a proper understanding of their structure and their meaning.

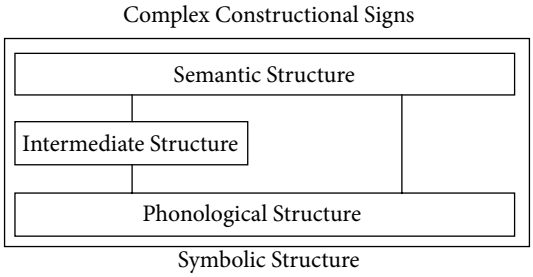

Figure 1c. The make-up of complex constructional signs.

Some theorists may — understandably — respond to this by saying that this intermediate level of structure simply is the level of syntax that they have been assuming all along. I do not disagree. But the preceding discussion has also shown that no additional principles and processes of sign use have to be invoked in order to account for the existence and function of such a level. When the number of signs being used is large, an additional property emerges that does not exist for individual signs. The fact that there are so many of them creates an additional environment for linguistic signs (beyond the world and the users that are the only environments for individual signs), viz. the *linguistic* environment that they frequently do or do not occur in. Exactly the same processes and capacities that allow humans to use signs to make inferences about the world and about other humans in particular ways, also allow them to make inferences about the linguistic environment in particular ways. Elements that relate to the world in a similar way are assembled into categories, as are elements that have a similar interactional or discourse use, which imposes structure on the total set of elements; by means of the same processes, elements that relate to other linguistic elements in similar ways, are also assembled into categories, adding to the structure of the set of linguistic elements. In other words, the ubiquity of linguistic environments and the differential distribution of elements over these, causes additional structure to be imposed on the language.

This is what I meant when I said at the end of Section 1 that in terms of linguistic *structure*, some level of form mediating between sound and meaning is an indispensible independent part of the architecture of grammar, but in terms of *processes*, no more is involved than the elementary capacities of processing sound and conceptual content, and of using signs. Therefore, introducing intermediate structure ('morphosyntax') does not amount to introducing an obscure, irreducible level of Grammatical Form as in Figure 1(b). It emerges as a consequence of a new environment for signs which in turn is the consequence of the size of the set of signs in use, much in the same sense as the level of the structure of solid matter emerges as a consequence of large numbers of atoms interacting (under certain conditions): the higher level of organization exhibits properties not present at a lower level (no single atom is either solid or fluid), while they can be fully

explained in terms of (i.e. reduced to) the properties of atoms and their interaction (at the lower level), and at the same time constitute a causal factor in what happens to the lower level entities, witness, for example, the effects of crystal structure for individual atoms and electrons contained in it (cf. Verhagen, in press, for an elaboration of this point).

Although Figure 1(c) shows that the choice is not restricted to the options depicted in Figure 1(a) and (b), it is still somewhat too schematic, if only because it leaves out the *distributional* aspect of knowledge of a construction and its parts. More precisely, the semiotic organization of a construction should be thought of in terms of Figure 13, starting at the bottom.

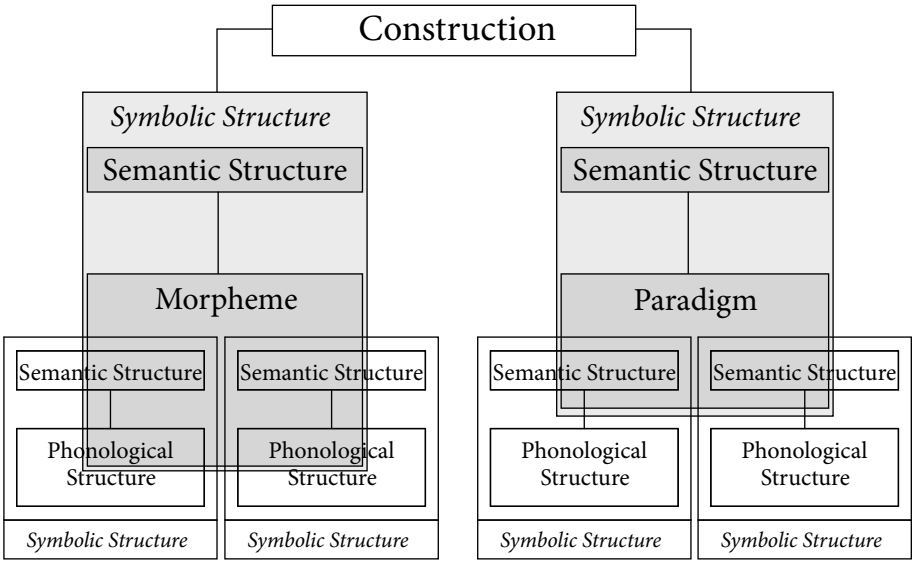

Figure 13. The semantic-distributional organization of a constructional sign

The basis of any constructional sign is a set of individual sound-meaning pairings that occur in actual language use (i.e. in utterances). These are symbolic structures in the sense of having (real) phonological structures, each conventionally associated with a specific semantic structure (essentially, words). When some of these linguistic elements recur over and over again in the same kind of linguistic environment, having certain properties in common, this may get represented in speakers' long term memory. When such shared properties involve aspects of the sound structure as well as aspects of the semantic structure of the distinct basic signs, such a generalization results in a *grammatical morpheme*: some recurrent piece of sound structure systematically associated with a recurrent aspect of interpretation in a particular kind of environment. When this environment is part of a word, we have a case of a so-called bound morpheme, but other grammatical elements, such

as auxiliaries, articles, and conjunctions fall under the same rubric.[18] It is clear that this result of a generalization over symbolic structures may itself also be considered a symbolic structure, even if it does not occur independently. For example, the plural suffix *-s* in English is such a sound-meaning pairing that results from a generalization over many instances of specific signs containing an final *s*-sound while denoting more than one entity of the same kind.

When certain linguistic elements repeatedly occur in the same kind of environments and share certain semantic properties (in that environment) but not a common sound structure, the abstract unit resulting from the same process of generalization is what we have identified as a paradigm: a certain class of elements that have a similar distribution and (usually) a semantic aspect associated with them (in this kind of environment), limiting cases being, on the one hand, that the semantics is compatible with that of the construction, and on the other hand, that an element uniquely identifies a construction without adding specific semantics (such as *banen* in the Dutch *way* construction and *fritter* in the English TIME-*away* construction; cf. Verhagen 2007). Notice that, as Figure 13 suggests, grammatical morphemes and paradigms can actually be seen as strongly related concepts in this usage-based perspective: they consist of representations of common distributional and semantic properties, the difference being that grammatical morphemes also include a common piece of phonological structure.

A typical construction, then, consists of a collection of morphemes and paradigms, just in case a particular aspect of meaning is associated with this particular *combination* of units (and not necessarily associated with the occurrence of one of these units in another environment). Thus, a construction can itself also be considered a complex sign, the form-part consisting of elements that are generalizations over actual sound-meaning pairings, i.e. morphemes and paradigms. The difference is that a construction, involving a particular pattern of combination for these elements, also has a syntagmatic dimension, besides the paradigmatic one of its constituent units.

In actual practice, grammatical morphemes normally are not just that (a sound structure with a certain grammatical meaning), but constructions in the sense just defined. Consider the example of the plural suffix *-s* again. The notion 'plural' is actually not associated with this piece of phonology as such, but with this piece of phonology *combined with* an element from a particular class. After all, the same phonological structure *-s* may also indicate possession (or more generally: a reference point relationship; cf. Langacker 1993) as in *John's book* or *the speaker's intention*, or third person present tense (*Bush wins*, *He knows*). Thus, the sound

18. Cf. Schilperoord & Verhagen (2006) for a psycholinguistic treatment of 'function words' in this way.

itself does not suffice to distinguish one sign from another, and it must actually be distinct combinations of this sound with certain elements from *distinct* distributional classes — in other words, different constructions — that constitute the distinct signs we know as the plural, the possessive, and the agreement suffixes (yet another indication that schematization over phonological structures per se cannot bear the burden of supplying the schematized form of constructions). These different suffixes all have the full structure indicated in Figure 13 (a sound structure and a particular paradigm, jointly associated with a particular meaning), while many other constructions comprise more than two of such elements.[19]

In view of this observation, the question might be raised whether the notion 'paradigm' could not be dispensed with in favor of, simply, 'construction', since it should be allowed anyway that slots of constructions can be filled with instantiations of other constructions, and paradigms are also signifying entities.[20] While the latter is undoubtedly true, there is still a good reason to distinguish paradigms from constructions in general, perhaps by considering them a special case. For example, in the expressive binominal construction, slots 2 and 5 both can be filled with noun phrases with adjectival modifiers (e.g. *a gentle giant of a black boy*), but it is not the fact that *a gentle giant* instantiates the Noun Phrase construction that makes it belong to the distributional and semantic class that is relevant for the defining the construction involved (evaluative scalar expressions with an extreme value), nor does this provide the necessary distinction between the class of elements in slot 2 and that in slot 5, while the internal syntax of the phrases in 2 and 5 does not differ (there is no *separate* construction, with partly independent syntax distinguishable from noun phrases in general, to refer to the kind of entities that go into slot 2). So while some paradigms may coincide with constructions (slot 5 in the construction mentioned might be a case in point), this does not hold in general. I therefore continue to use the separate term 'paradigm' for 'distributional (+semantic) class', identified by a slot in one or more constructions.

5. Conclusions

The main conclusions from the above considerations can be formulated as follows:

19. Whereas each single slot of each single construction defines a paradigm, and some elements only occur in one such a paradigm, several elements have the possibility of occurring in many constructions. These elements constitute the most general distributional classes of a language (its 'parts of speech'), but they are not qualitatively distinct from any other paradigm.

20. The question was actually raised by a reviewer.

- The form-part of constructional schema's is in need of conceptual clarification both in (Radical) Construction Grammar and in Cognitive Grammar. In the former case, the approach runs the risk of circularity by defining grammar as form–meaning pairings and then using grammar as part of the specification of form in such pairings. In the latter case, the point is that schematized phonology is quickly indistinct from any sound pattern, and thus cannot serve as a trigger for any particular meaning.
- The previous point does not necessarily apply to certain other construction-based approaches, such as Jackendoff's and other varieties positing a separate level of 'grammatical form' or 'morphosyntactic structure', but these are subject to the general scientific criticism of not achieving a maximal reduction of the number of primitives assumed, given that the minimum required for language are the capacities to process sound, conceptualization, and the capacity to use signs (including symbols, based on intersubjectivity).
- The basis for the solution to both problems is provided by the insight that when speaking about signs, the notion 'form' is fundamentally ambiguous, on the one hand denoting something immediately observable (a percept), and on the other hand denoting what it is that is used by people (as signifier) to make an inference about something not immediately observable. These two aspects of the notion 'form of a sign' are not necessarily coupled: something that is cognitively accessible, even if it is not a percept itself (though ultimately evoked by some percept(s)), can also be used by people to make inferences about something else that is not immediately observable (cognitively less accessible); the distinction between 'sound' and 'meaning' does not coincide with the distinction between 'signifier' and 'signified'.
- Furthermore, another relevant insight from sign theory is that not all links between form and interpretation have to be symbolic (in the strict sense of being used in accordance with conventional rules, based on the capacity to recognize and share intentions).
- Extending these insights to constructions conceived as complex signs, it is in fact quite natural to conclude that distributional paradigms can function as characteristics to make constructional signs recognizable. Without the need to invoke additional cognitive capacities, distributional paradigms emerge as a consequence of the size of the set of signs in use in a community, which creates an additional environment for linguistic units to be systematically associated with beyond the world and the language users, viz. other linguistic units. Recognizing an element as a member of a particular class, viz. the class of elements fitting a slot of a construction can help trigger the recognition of the construction involved, possibly more in the way of a *symptom* than as a (conventional) symbol, although the balance between motivation and

conventionality is something that varies within and across constructions and languages, and has to be determined for each case separately.

This approach has a number of consequences. First of all, it avoids the objections that can and must be raised against the other views. It characterizes 'form' in constructions not as schematized phonology, but in terms of paradigms and morphemes, which are themselves extracted from concrete sound-meaning pairings in linguistic usage events. Thus, it shares the view of (Radical) Construction Grammar and other morphosyntactic varieties of constructional approaches, that some sort of secondary specification of 'form' is needed for constructions, beyond schematized phonology.

On the other hand, by defining these secondary specifications in terms of the distribution and meaning of the morphemes and the paradigms in constructions, it does not invoke a level of irreducible notions of syntactic structure to characterize these intermediate levels of representation. Thus, it shares the view of Cognitive Grammar that a reduction of grammatical phenomena to the more basic phenomena of sound and meaning is highly desirable and at the same time attainable.

In this approach, the need for an intermediate level of representation between sound structure and meaning in constructions does not entail the need for an independent theory of autonomous syntax to account for the properties of elements at that level of representation. The idea that such an entailment is unavoidable has often been assumed, both by supporters of some form of autonomous syntax (most notably Jackendoff, cf. Culicover & Jackendoff 2005 for a recent statement) and by its opponents (such as Langacker). What I have shown is that this presumed entailment simply is not valid; in a usage-based approach to signs and the dynamics of sign formation, one can have one's cake and eat it too.

By the same token, it will be clear that the present approach — of identifying some aspects of 'form' in constructions in terms of distributional and semantic classes — also has the virtue of avoiding the problem identified by Croft (2001) that parts of speech and grammatical relations cannot have universal definitions, as they have to be defined in terms of constructional environments and constructions are language specific (cf. Section 2.2). In the present approach, all paradigms (including the most general ones, the parts of speech) and syntagmatic relationships have language-specific definitions as a matter of principle (but see note 8).

As laid out in Section 4.3, this approach also has consequences for our conceptualization of constructions as complex signs. This follows directly from the new conceptualization of the notion 'form' in terms of a usage-based conception of sign (trans)formation. As a result, we have come to recognize that complex signs do not only differ from simple ones in that they consist of more than one distinct element ('horizontally'); in the case of typical constructions containing variables, they are

also more complex in the 'vertical' dimension, comprising an intermediate level of representation, between sound and meaning, consisting of grammatical elements and paradigms, including their meaning, the instantiation of which (rather than the sound structures involved themselves) can function to trigger the recognition of the construction. The insight that such an intermediary level is necessary, i.e. that pure sound cannot serve the purpose of signaling a construction, is the element of truth in the position of morphosyntactic varieties of construction grammar (including Croft's and Goldberg's). The insight that elements at such a level should be reducible to more fundamental notions, is the element of truth in the position of Cognitive Grammar.

What these conclusions suggest is precisely that, when elaborated thoroughly, the positions of these different varieties of constructional approaches to grammar are actually closer to each other than the terminology, as well as the discussion in Langacker (2005) suggests. If proponents of morphosyntactic varieties are willing to adopt the insight that the meanings of phonological signals may in turn be used to signal further aspects of interpretation, including the meaning of constructions, then they have a way to achieve the reduction of the properties of the intermediate level of representation (without losing it), which would obviously bring them closer to Cognitive Grammar. On the other hand, I have also argued that it is simply unavoidable for Cognitive Grammar to allow other elements than schematized phonology to function as the form-part of composite signs (assuming that the form-part of a sign should be able to 'evoke' the meaning, and not only be associated with it; cf. note 4). There is in fact a simple way to achieve this, viz. to allow some elements that now only show up on the side of the semantic pole in Cognitive Grammar diagrams, to function as signifying elements for constructional meanings as well; consider the Cognitive Grammar representation of the ditransitive construction once again:

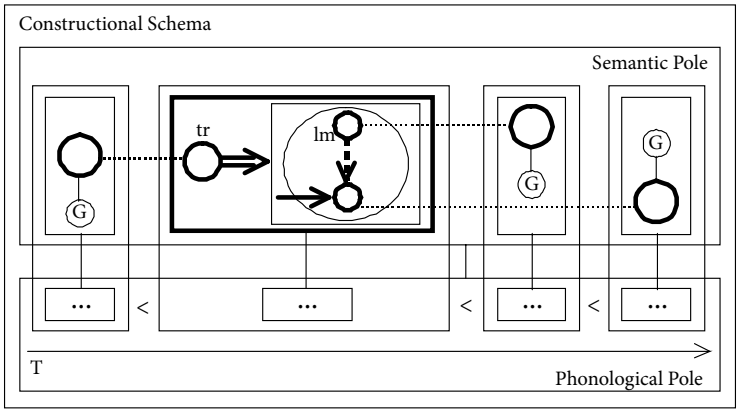

Figure 7. The representation of the ditransitive construction in CogG

Notice that the elements denoted by 'NP' or 'SUBJ' and 'OBJ' in (Radical) Construction Grammar representations as part of the formal specification of the construction, are actually also present in this representation, but only as part of the *semantic* specification. And of course, they are indeed meanings, viz. of the relevant sound structures of each of the noun phrases. If it is recognized that these meanings may, in certain circumstances, function to evoke the entire frame of an event of transfer, also when the verb does not conventionally denote transfer, then this will immediately (almost) close the gap between Cognitive Grammar and (other) constructional analyses: in such a situation, it is this composite conceptual structure of three participants (of a particular kind) that 'symbolizes', or at least 'signals', the *entire* conceptualization of Figure 7. As a matter of fact, Langacker's own theory of reference points (Langacker 1993) can be straightforwardly applied to this situation (the presence of three distinct participants of the relevant kind serving to provide cognitive access to the concept of transfer).

In any case, if Cognitive Grammar representations are extended in this way, and if the elements making up representations of form in morphosyntactic varieties are interpreted as morphemes and paradigms in the sense elaborated here, then the differences are greatly reduced, if not eliminated, in my view. Since both of these moves are arguably unavoidable anyway, we may conclude that at least one theoretical difference between different constructional approaches has been brought closer to a resolution by further conceptual clarification, in particular by investigating what it is that makes some phenomenon into the 'form' of a sign, and how a separate level of structure may in principle emerge while being fully reducible to properties of elements and processes at a lower level.

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Author's address

prof. Arie Verhagen
Leiden University Centre for Linguistics
P.N. van Eyckhof 1
2311 BV Leiden
The Netherlands

arie@arieverhagen.nl