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# Construction Grammar

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## 1. Introduction

### *1.1. Conceptual underpinnings*

Construction Grammar (CxG) is a theoretical approach in which generalizations about linguistic structure are formulated in terms of 'constructions', i.e., conventionalized clusters of features (syntactic, prosodic, pragmatic, semantic, textual, etc.) that recur as further indivisible associations between form and meaning (meaning is broadly understood, see below). The constructional approach developed out of a confluence of interests – linguistic, cognitive, anthropological, philosophical, computational – which all revolved around the idea that linguistic form is inextricably bound with its meaning and its communicative function and that this connection must be the basis for any descriptively and explanatorily adequate theory of linguistic structure. The conceptual origins of CxG can be traced most directly to Fillmore's Case Grammar, a case-role based approach to syntactic analysis, laid out in Fillmore's (1968) seminal paper.

The goal of CxG is to account for the defining properties of *all* types of linguistic expressions. This is based on the assumption that any kind of linguistic structure – whether 'regular' or relatively unusual – has an equal informational value in our quest for understanding the nature of language as a particular kind of cognitive and social behavior. The explicitly stated objective is to study language in its totality, without making any distinction between 'core' and 'periphery' or assuming that certain structures are inherently more deserving of an analyst's attention. The justification for such an approach can be articulated in terms of the following two hypotheses: (i) a model that can handle complicated, out-of-the-ordinary patterns, can surely handle the common ones as well and (ii) the study of unusual patterning can also help us understand the nature of grammar organization in general.

A research program of this kind necessarily calls for a relatively complex basic unit of analysis, one that can accommodate features of various kinds (syntactic, morphological, semantic, pragmatic, etc.) in a single integrated and internally structured whole. Consistent with this requirement is the idea of a 'sign' as a symbolic unit that represents a conventional association between form and meaning/function; in CxG, the sign is called CONSTRUCTION and applies to all types of linguistic entities. *Form* in constructions may refer to any combination of syntactic, morphological, or prosodic features and *meaning/function* is understood in

a broad sense that includes reference to lexical semantics, event structure, diathesis, pragmatics, and discourse structure (a detailed explication and exemplification of the combinatorial possibilities can be found in Fried & Östman 2004b: 18-22). A grammar in this view consists of a repertoire of constructions, which are organized in networks of overlapping and complementary patterns.

The central importance of constructions is motivated by two empirical observations: (i) even semantically opaque expressions (idioms) may share certain aspects of regular syntactic structure with fully productive expressions (Fillmore, Kay & O'Connor 1988) and (ii) even seemingly transparent syntactic structures may involve all sorts of unpredictable constraints that cannot be simply derived from the syntax alone (cf. Fillmore's 1986a analysis of English conditionals). A fundamental claim of construction grammarians is the following: to ignore either of these two observations would mean to miss important generalizations about the nature of linguistic patterning and the nature of speakers' linguistic knowledge. The work of different constructional analysts may emphasize one or the other perspective, but systematic research of the last thirty years has shown that both perspectives are inextricably interconnected and the notion of idiomaticity requires a much more nuanced approach than the traditional division based essentially on semantic non-compositionality of particular expressions.

The difficulties of drawing the line between what should count as an idiom in the traditional sense and a productive syntactic pattern have been addressed explicitly in numerous articles (e.g. Fillmore 1989 on the expression type *the greener the better*, Lambrecht 1988 on *There's a farmer had a dog*, Kay & Fillmore 1999 on *What's Bill doing inspecting the car?*). But the challenge in addressing this distinction can also manifest itself in more subtle ways, involving expressions that are syntactically quite simple.

For example, *blue ink*, *blue sweater*, or *blue paper* are evidently instances of a regular modification structure [Mod – N]; semantically, the modifier slot could be filled not only by other color terms, but also by any other semantically compatible adjective, and the meaning would also be a composition of the meaning of the adjective and the meaning of the noun, the former restricting the eligible referents of the latter. Thus, the meaning of the actual phrases can be figured out if we know what *blue* means and what *ink*, *sweater*, or *paper* mean outside of any context. In contrast, the meaning of the expression *blue moon* is not predictable from the meaning of its component; it is an idiom in the traditional sense. At the same time, it shares the same syntactic structure [Mod – N], and even in other ways the phrase follows the behavior of English NPs (e.g., it takes an article). There just is no flexibility with respect to the fillers of the two syntactic slots and the expression thus falls into the same type of expressions as the more familiar cases of VP idioms (*spill the beans*, *hit the road*, etc.) in terms of its semantic non-compositionality coupled with a transparent

syntactic structure shared with productive instances of that structure. But then in expressions like *blue eyes*, we detect features of both. On the one hand, this phrase still has the same syntactic structure and even a certain degree of productivity (*blue/hazel/green/dark*/etc. *eyes*) shared with the semantically fully compositional expressions. On the other, it has idiosyncratic properties of its own: the interpretation of the whole is not quite the same as with the combinations *blue ink/sweater/paper* in that the color modifier conventionally applies only to a particular part of the object denoted by the noun (the iris) and in this metonymic meaning, the noun slot is dedicated to a particular lexical item (*eye/eyes*). In cases like these, it becomes impossible to apply a simple binary categorization into (lexical) idioms vs. fully transparent syntactic combinations of words. The point of a constructional approach is to allow us to treat all these different types of expressions as related along identifiable shared properties, while also keeping in focus the dimensions in which they constitute distinct grammatical entities. In section 2.3, I will illustrate how this can be done.

Especially in early CxG analyses, the commitment to describing all of language manifested itself in a strong focus on studying 'unusual' grammatical patterns, with little or no systematic attention devoted to more ordinary ones (say, basic transitive sentences, passives, *wh*-structures, etc.). The perception, within some schools of thought, that CxG is good only for studying idioms may have its origin, at least in part, in this early bias toward the conspicuously irregular. However, such an assessment either reduces the scope of CxG research to a domain delimited by a very restricted understanding of idiomaticity or, more likely, is based on a fundamental misunderstanding of the nature of the approach as a whole. At any rate, since the early preoccupation with the nature of standard idioms, CxG practitioners have turned their attention to a broad range of topics in grammatical description and the model has developed into a robust, well-established theoretical tool for analyzing and representing linguistic behavior in general. Moreover, the approach is now used and further developed in several additional areas of research that were not part of the original design. Among them are language acquisition, typological studies, language change, text linguistics and certain strands of interactional linguistics, and most recently also in computational linguistics for modeling language evolution and language understanding. I will comment on each of these areas in section 4, after first explaining the inner workings of CxG in sections 2 and 3.

### *1.2 Basic assumptions, methods, research goals*

CxG shares with other grammatical approaches – whether 'cognitive' or mainstream 'generative' – the assumption that language is a learnable cognitive system that is internally structured and provides means for producing and interpreting novel utterances. Beyond this, however, the methodology and research goals associated with CxG are in marked

contrast with the generative approach and are shaped by particular assumptions concerning the relationship between grammar and lexicon, the sources of explanation, and the nature of empirical data.

First off, CxG, like other cognitively oriented approaches, does not draw a categorical distinction between lexicon and grammar, thereby providing the necessary analytic and representational flexibility in accommodating the amply documented gradience in categorial distinctions. This feature is inherent in extending the idea of signs from the domain of words (the lexicon), where it has resided traditionally, into the domain of grammatical structure. While CxG does not reject the intuitive and pre-theoretically useful notions of 'grammatical' vs. 'lexical', the conceptual basis and the architecture of the model does not force the analyst to impose any arbitrary boundaries between what counts as a lexical item and what is a lexically independent (morpho)syntactic structure. Instead, lexical items on the one hand and highly schematic, abstract grammatical patterns on the other are seen as two poles of a continuum along which much of our linguistic knowledge can be arranged.[1] Likewise, linguistic categories are treated as functional prototypes, as specific focal points along a continuum of categoriality.

The way constructions may differ in the degree of specificity is illustrated in Table 1. The examples are listed in the order from fully specific lexical items, in which nothing is left to variation and which may consist of a single word or be multiword units (i.e., lexical items, as linguistic objects, are constructions as well), to fully schematic syntactic or morphological patterns, in which perhaps only (morpho)syntactic or lexical categories, their structural and linear position, and their mutual relationship need be specified explicitly. The partially schematic constructions form a continuum between these two poles in that some part of each construction is fixed and the rest is schematic.

[1] As will be evident also in this text, construction grammarians find it convenient and useful to use the traditional terms 'lexical' and 'grammatical'. It is important to stress, though, that these terms are used merely for general reference to the endpoints of the continuum (or, more precisely, to typical, uncontroversial examples of the endpoints); the labels are not intended as theoretical claims expressing a categorical distinction. Put differently, lexicon and syntax are not to be thought of as something in addition to constructions, as one reviewer suggested. While we may conceptualize language as encompassing these two domains (mostly for practical expository purposes), they both consist of nothing but constructions of various kinds and of varying degrees of schematicity.

**Table 1.** Examples of English constructions on the lexicon-grammar continuum.

| Degrees of schematicity: | Examples: |
|---|---|
| - fully filled and fixed | *blue moon, by and large, children, ink, blue* |
| - fully filled and partially flexible | *go*[tense] *postal, hit*[tense] *the road* |
| - partially filled | *the* [AdjP] (e.g. *the rich/hungry/young*) |
| | [time expression] *ago* (e.g. *six days/beers ago*) |
| | adj-*ly* (e.g. *richly, happily*) |
| - fully schematic | $[V\ NP]_{VP}$, $[NP\ VP]_{S}$ |
| | $stem_{V}$-PAST (e.g. *walk-ed, smell-ed*) |

Second, CxG does not work with any notion of an *a priori* established universal structure that would be the basis of every grammatical pattern; instead, it seeks explanations for any universal as well as language-specific properties in certain combinatorial strategies that are based on general cognitive principles and regular communicative strategies. The relevant cognitive principles include categorization, focus of attention, types of reasoning and inferencing strategies (including metonymy and metaphor), associative memory, planning ahead, etc. The communication-based explanations are concerned with information flow, the nature of speaker-hearer relations, subjective/affective involvement, principles of politeness, text-cohesion strategies, etc.

Third, in rejecting the idea that the true nature of language can be best studied and grasped on the basis of an idealized subset of 'core' linguistic expressions, CxG makes a commitment to exploring language in its authentic manifestations and puts emphasis on empirically grounded analysis. Methodologically this translates into an inductively oriented approach: a search for recurring patterns about which we can formulate adequate "surface generalizations" (Goldberg 2002). The usage-based aspirations of CxG are also reflected in its attention to issues of context in grammatical descriptions, analyzing data that can shed light on the role of discourse structure and the socio-pragmatic dimension of linguistic organization.

Finally, constructions are not only the basic units of linguistic analysis and representation, but are also taken to be hypotheses about speakers' linguistic knowledge. All of CxG research is motivated by one basic general question (whether stated as such explicitly, or just tacitly assumed): what constitutes speakers' native-like knowledge and understanding of any given linguistic structure?

### *1.3 Frame Semantics*

The focus on incorporating the semantic and pragmatic dimension of linguistic structure is most visibly manifested in the semantic 'sister theory' of CxG known as Frame Semantics (e.g., Fillmore 1982, 1984, Lambrecht 1984, Fillmore & Atkins 1992, Atkins 1994, Atkins et al. 2003,

Fillmore et al. 2003, Boas 2003, Fried 2005, 2007a, 2010a, To appear), as well as in the semantic orientation of the construction grammarians' interest in pursuing computational applications.

Frame Semantics is concerned with the 'semantics of understanding'. Linguistically relevant semantic information is schematized in 'interpretive frames' (Fillmore 1982), which are structured representations of speakers' conceptualizations of the experienced world and contain information, organized in clusters of frame elements (FEs), that reflects speakers' native *understanding* of what the lexical item means and how it can be used in context. A single linguistic expression may be associated with multiple frames and, conversely, a single frame may be shared by multiple expressions; each such expression, then, represents a particular conceptualization of certain parts of the larger background scene. The frame also carries information about the conventional expression of the syntactically relevant participants as they manifest themselves in the syntactic organization of sentences (see section 3.4). This is a unique feature of Frame Semantics as a lexical semantic model: the built-in connection between lexical meaning of an item and the canonical (morpho)syntactic expression of its frame elements, which, again, may differ in their degree of specificity/schematicity. Taking predicates as an example, some frames may only specify the number and type of event roles and those unify with general linking patterns ('linking constructions', discussed in section 3.4), which give them an appropriate syntactic form (what such very general frame patterns might be is explored in Fried 2005), while other frames have to make an explicit connection to a particular form (these kinds of frame-syntax associations are analyzed in Fillmore & Atkins 1992, *inter alia*).

CxG and Frame Semantics together offer a model for representing lexico-grammatical networks in which the relative stability of grammatical form does not conflict with the relative flexibility of meaning and expressive richness, and vice versa.

### *1.4 Construction Grammar(s) and related models of language*

Berkeley-based CxG is not a monolithic framework and constructional work is associated with several recognizable strands; differences among them, however, are more an issue of focus or emphasis rather than any fundamental divergence. Its original conception, developed by Ch.J. Fillmore and his associates, is characterized by its focus on issues of phrasal, clausal, and sentential syntax (e.g. Fillmore 1986a, 1988, 1999; Lambrecht 1995; Michaelis & Lambrecht 1996; papers in Fried & Östman 2004a; Lambrecht & Lemoine 2005; Fried 2007b) and by accepting the importance of a more or less consistent formal notation as a way of maintaining analytic rigor. This is also the strand that forms the basis of the present chapter. Other well-known variants are represented by

Goldberg's work, which is dedicated predominantly to issues of argument structure and primarily in the context of language acquisition, or Croft's (2001) Radical Construction Grammar, motivated primarily by typological issues.

There is also a good degree of compatibility between CxG and other theories that work with (some version of) the notion of construction. For example, much of the CxG notational system for representing constructions is similar to the representational practices in Head-Driven Phrase Structure Grammar (HPSG; e.g. Pollard & Sag 1994, Ginsburg & Sag 2000, Müller, this volume); both also use elaborate inheritance networks for capturing relationships among constructions. Some construction grammarians explicitly adopt the HPSG formalism and analytic principles (e.g. Kay 2002, 2005, Ruppenhofer & Michaelis 2010). However, there are also significant differences between the two models, particularly in their fundamental focus and articulated goals: HPSG does not share the explicitly stated concern of Fillmorean CxG for integrating the semantic, cognitive, and interactional dimensions in constructional representations, nor does it include provisions for incorporating the insights of Frame Semantics concerning the interplay between word meaning and (morpho)syntactic structure: HPSG takes the formal pole as central and the starting point of analysis, while CxG recognizes function and meaning as a crucial source of insight concerning the shape of linguistic expressions. Both approaches also differ with respect to more specific phenomena, such as endocentricity (CxG does not operate with the concept known as Head Feature Principle) and locality (CxG does not make use of this concept and its logical consequence – the positing of unary branching structures), as pointed out by Ruppenhofer & Michaelis (2010).

Another approach that overlaps with many of the basic characteristics of CxG is Cognitive Grammar (Langacker 1987, 2005). In general, Cognitive Grammar emphasizes the indispensability of the conceptual dimension of constructions as the central element in linguistic structure, rather than its grammatical form or the details of the mapping between the two poles. Goldberg's and Croft's constructional approaches show some convergence with the Cognitive Grammar tradition. Fillmorean CxG, on the other hand, does not accord the conceptual layer a privileged status relative to the formal and/or communicative dimensions.

## 2 Basic notions

### *2.1 Constructions and constructs*

The notion and term 'construction' has the status of a theoretical entity in CxG: it is defined as a symbolic sign which provides a general, multidimensional 'blueprint' for licensing well-formed linguistic expressions and that applies to units of any size or internal complexity (morphological units, words, phrases, clauses, etc.). Constructions capture

generalizations about conventional linguistic knowledge that cannot be derived or predicted on the basis of knowing any other pieces of a given language. It is also crucial to keep in mind that constructions are distinct from 'constructs' (or 'instances of constructions' in another terminological practice): the former are abstractions, "pieces of grammar" (Kay & Fillmore 1999: 2), while constructs are physical realizations of constructions in actual discourse. A construction is thus a generalization over constructs of the same type. To illustrate, Table 2 lists examples of constructs and the corresponding constructions that license them.

**Table 2.** Some English constructions and corresponding constructs

| | |
|---|---|
| Passive | *be greeted by the Prime Minister* |
| Object-Control Co-instantiation | *persuade the children to come* |
| Modification | *new candy, tall tree, large houses* |
| Plural Noun | *students, cars, beers* |

CxG recognizes the fact that constructional specifications also differ from each other according to the function they serve and to the type of linguistic entity they describe. E.g. 'lexical' constructions capture the properties of lexical items (*persuade, children*); 'linking' constructions specify conventional patterns of argument realization (Passive, Active Transitive, Motion, etc.); other constructions make generalizations about constituent structure (Plural Noun, Modification, Object-Control); there may also be 'linearization' constructions for capturing word order patterns that are independent of dominance relations (such as, perhaps, verb-second phenomena, clitic clusters, topic-focus articulation, etc.).

### *2.2 Constructional meaning*

It is a definitional property of any construction to be more than just a sum of its parts and thus to have a 'meaning' that cannot be derived compositionally from the properties of its constituents. Constructions are signs (recall the explication in section 1.1) and, therefore, never compositional. This characterization seems to have created some confusion among the non-constructionists about the nature of constructional meaning and the status of non-compositionality in CxG. The key to understanding these definitions lies in returning to the early explications of what constitutes a construction and in making the distinction between constructions and constructs.

Constructions are defined as objects of syntactic representation that "are assigned one or more *conventional functions* […] together with whatever is conventionalized about its contribution to the meaning or the use of structure containing it" (Fillmore 1988: 36, emphasis mine). This definition suggests a distinction between the function of a construction as a piece of grammar and the meaning of a linguistic expression (i.e. a

construct); the distinction is made quite explicit in a subsequent wording of the definition, which states that a construction is "dedicated to a particular function in the creation of meaningful utterances in the language" (Fillmore 1989: 18). It follows that constructions are not necessarily expected to have a meaning in the sense of specific semantic content. Some do, as was later shown by Goldberg (1995) for particular types of argument structure constructions, but such examples represent only one type of constructions: those which manipulate the inherent meaning of predicates by elaborating their valence structure in particular ways.

However, not all syntactic patterns involve meaning in the same sense as certain (though not all) argument structure manipulations may. Such patterns include the Modification construction (instantiated by *new car, blue ink*), Subject-Predicate (*Dogs bark, The boat capsized*), VP construction (*reads poetry, found a mistake*), or, say, constructions that capture the linear organization of sentences into field slots determined by information-structure considerations in languages with flexible word order. Yet, these syntactic patterns illustrate precisely the phenomena that motivated the constructional definitions quoted above: what is conventional about these patterns is their syntactic function, such as government, grammatical relation, determination, modification, agreement, headedness, or functions motivated by information flow. These constructions represent dependencies and configurations that are accepted by the speakers as regular grammar expressing constituent structure or linear organization, although once we know what the constructs licensed by them consist of lexically, the semantic content of the whole expression (i.e. a construct, not construction!) may very well be obtained compositionally, by adding up the meanings of the words that instantiate the grammatical pattern in discourse.

What is constructional, i.e. in some sense non-compositional, about these kinds of configurations may be, for example, the functional relationship between the constituents. Thus the 'meaning' of (one type of) Modification construction could be labeled as 'restrict reference of the noun by the property expressed by the modifier'. It is not an inherent and automatically projected feature of nouns that their referential range will be restricted and that the restriction will take this particular form, nor is it necessarily a feature of every adjective that it will be used as a modifier. Putting the two next to each other will not alert speakers to interpret them as a modification pattern unless the speakers operate with the conventional, shared knowledge that such a pattern exists and that it provides an interpretive clue as to the mutual relation between the two items. Similarly, the constructional status of the English Subject-Predicate pattern comes from the fact that it encodes a particular, otherwise unpredictable event-participant relation, which is different, for example, from an event-participant relation encoded by a verb phrase. Put differently, it is not an inherent feature of nouns or noun phrases that they

serve the subject function; it is only by virtue of appearing in a specific, convention-based combination (construction) with a finite verb that gives them this grammatical role. What, thus, constitutes the 'meaning' of the pattern [noun – finite verb] is the fact that the combination expresses a subject—predicate relation. It is in this rather abstract sense that these constructions can be considered non-compositional.[2] Whether there will also be specific (semantic, pragmatic, or other) constraints on the internal constituents, such as, say, animacy or contextual boundedness of the subject referent, will depend on the language.

A slightly more elaborate case is presented by the English Determination construction: its non-compositionality consists in the fact that the combination of a determiner and a noun designates a semantically bounded entity, whether or not its constituents are inherently compatible with boundedness (for an explication of this and other semantic features relevant to the syntax of nominal expressions, cf. Talmy 1988). For example, the phrase *much snow* consists of semantically unbounded items but as a whole, the combination is compatible with contexts in which boundedness is required and the phrase thus behaves the same way as phrases in which boundedness may be part of the inherent meaning of their parts (*a car*, *the cars*, etc.): the sentences *I couldn't clear much snow in half an hour*/**I couldn't clear snow in half an hour* present the same kind of contrast as *I fixed the car*(*s*) *in a week*/**I fixed cars in a week*. The point is that the presence of the completive adverbial (*in half an hour, in a week*) requires a bounded interpretation of the substance that is being manipulated (cleared, fixed, etc.) in order for the whole proposition to be semantically coherent. The Determination construction is thus non-compositional in the sense that the combination as a whole is necessarily bounded, while its constituents are unspecified for boundedness and may, therefore, even be in conflict with this constructional requirement (i.e., they may not simply 'add up'. (For a full analysis of the construction and the argumentation, cf. Fried & Östman 2004b: 33-37).

For further illustration of the range of constructional meanings that are outside the domain of argument realization patterns, consider the following pair of sentences:

(1) a. *Why don't you be the leader*?
b. *Why didn't you become the leader*?

Superficially, both constructs could be viewed as instances of a negative *wh*-question. However, a closer analysis would reveal that (1a) differs

[2] Thus it is not the case, suggested by one reviewer, that CxG somehow establishes an inventory of constructions that can be compositional and then "adds" meaning to them, in order to make them non-compositional. The very fact that two (or more) components form a conventional grammatical pattern that serves, as a whole, an identifiable function in a larger syntagmatic context, and that speakers recognize as such, gives the combination its constructional status.

from (1b) in ways that make the (1a) pattern unpredictable. Most conspicuous among those features are the following: (1a) can only occur with a present tense verb, while (1b) is unrestricted; (1a) allows a *do*-support negation with the verb *be*, which is not normally the case, whether in questions of the type (1b) or elsewhere; and, crucially, (1a) has the pragmatic force of a positive suggestion ('I suggest that you be the leader'), whereas (1b) can only be a genuine information question. Each sentence in (1) is thus licensed by a different construction (Positive *wh*-Suggestion and Negative Information Question, respectively). Both are highly schematic and fully productive syntactic patterns, but they differ in what speech-act function they conventionally express, i.e. in their constructional meaning. (The Positive Suggestion meaning is also in conflict with various features of its own constituents, but that is a separate issue; such conflicts are addressed in section 3.5.)

The relevant question thus is not whether constructions always 'have meaning' but, instead, whether they can license also expressions whose propositional content may be compositional in the sense in which formal theories understand this notion. In other words, we must ask whether a particular string of words, or morphemes, in actual utterances may reveal a grammatical construction in the technical, theoretical sense if the meaning of the string (the construct) is actually a sum of the meanings of its parts. The answer is that non-compositionality in this narrowly semantic (i.e. propositional) sense is not a necessary condition for constructional status. Part of the problem is the term 'meaning', which can be misleading since the label has to apply to lexical as well as pragmatic and grammatical meaning. But part of the problem surrounding the status of (non-)compositionality may also arise simply from attempts to translate constructional analyses into the meta-language of formal theories. Such translations may be another contributing factor in the erroneous conclusion among non-constructionists that constructions cannot capture any generalizations about predictable ('compositional') phrasal meanings and are thus good only for describing idioms. It is important to emphasize that in many grammatical constructions (i.e. outside of argument structure constructions), 'non-compositionality' concerns the functional dimension of a particular schematic (syntactic or morphological) configuration, such as the examples just discussed, rather than the meaning of the words that can fill the constructional slots in actual utterances.

To summarize, when construction grammarians talk about the 'meaning' of constructions, they have in mind the following range of possibilities: 'idiomatic' (lexical) meaning, e.g. *the rich, blue moon, go postal*, etc.; grammatical function or dependency, such as determination, modification, government, diathesis, etc.; or pragmatic function, e.g. speech-act functions, politeness, etc.

*2.2 Rules vs. constraints*

Since CxG is a monotonic, declarative, unification-based framework, it does not work with any notion of generating linguistic expressions by applying grammatical rules; there is no mechanism that would derive one construction from another. Constructions can be freely combined with one another as long as they are not in conflict. Complex linguistic structures are thus accounted for by identifying what combination of smaller constructions is at work in licensing the expression as a whole. As a simple example, consider the following English sentence:

(2) *Can I change the reservation that my colleague made*?

This sentence is licensed by the combination of several highly schematic constructions, listed in (3b-h). The order in the list is arbitrary; accounting for the actual construct is independent of the order in which the constructions are combined:

(3) a. lexical constructions associated with the lexical items that fill the constructional slots (e.g. *can* [with its valence], *I, change* [with its valence], etc.)
b. Subject-Auxiliary Inversion construction to form a Y/N question (instantiated by *can I*)
c. Post-Nominal Modification construction (instantiated by *reservation that my colleague made*)
d. Restrictive Relative Clause construction, which combines a *wh*-word (*that*) with a Subject–Predicate construction with a "missing" non-subject argument (instantiated by *that my colleague made*)
e. Subject-Predicate construction (here licensing two clauses)
f. Determination construction (instantiated by *the reservation* and *my colleague*)
g. VP construction (directly instantiated by *change the reservation*)
h. Transitive (linking) construction, to ensure that both arguments of each verb (*change, make*) are realized in an active transitive pattern

It is also obvious that each of the constructions involved in licensing the sentence in (2) can be found in an infinite number of other expressions, in combination with any number of other constructions. Each construction simply specifies constraints on what types of entities can fill its slots and what combinatorial conditions may be imposed on them.

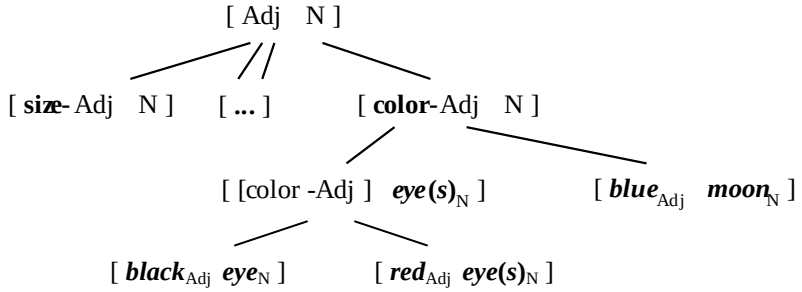
*2.3 Networks of grammatical patterns*

The grammar of a language is seen as an inventory of constructions (not assumed to be the same for all languages), which are

organized in structured networks of varying degrees of complexity. The networks capture relationships across constructions based on feature overlap and can be either onomasiological or semasiological in nature. An important concept in setting up the networks is that of inheritance, which provides a coherent way of organizing constructional specifications in terms of those properties that individual constructions have in common and those that set them apart as distinct objects. So far, the networks have been conceived of in two ways, both motivated by the kind of empirical data they cover and the analytic perspective we take.

One type works with strictly hierarchical trees. A root, which is the most general pattern, is inherited by all its descendants, each of which is a more specialized and narrowly applicable variant (Michaelis 1994, Michaelis & Lambrecht 1996); such hierarchies are motivated primarily by accounting for similarity in form. The nature of such a hierarchy can be illustrated on the (fairly simple) example of integrating the modification expressions *blue ink, blue eyes, blue moon* into a network of related patterns. As was discussed in section 1.1, they represent a continuum of form-meaning integration, in which all the expressions appear to be instances of the same syntactic pattern (modifier-noun). This is a generalization worth capturing, but the representation still has to preserve the equally salient fact that they differ in productivity and in the degree of compositionality in computing the meaning of each expression. Such a generalization can be articulated as a hierarchy of increasingly restricted variants of the most general, schematic Modification construction at the root, with each new generation of daughters introducing particular constraints, all the way to the fully filled and fully fixed combinations (such as *blue moon*, *black eye*, or *red eyes*), which share with the rest of the network only the syntactic configuration and either a specific color adjective or, at the bottom level, also the noun *eye*(*s*). The hierarchy, in a simplified form, is sketched informally in Figure 1; the bracketing is just a shortcut for a full representation of each construction. The nodes on the left are added to show that the Modification construction can have other variants based on different semantic types of modifiers; the boldface indicates new constraints that hold in a particular variant.

**Figure 1.** Hierarchical inheritance network of Modification constructions



Another type of network is needed for capturing partial inheritance, in which constructions are related through family resemblance relationships. This concerns cases where it is evident that a group of constructions is related through various subsets of shared features but where a true hierarchy of increasingly more constrained variants, or an empirically attested root, cannot be established. Family resemblance is often at play in capturing diachronic relationships among constructions; in those cases we are confronted with various residues and drifts, which can leave pieces of the putative hierarchy missing in the synchronic data (e.g. the problem reported in Ross 2009). But it also plays an important role in capturing associations between a particular functional domain and the constructions that may encode it (thus taking the opposite starting point as compared to the tree hierarchies). In this respect, the unifying element in the network is not some root construction, but a functional (or conceptual) space onto which given constructions can be mapped. The direction toward forming "constructional maps" of this kind has been taken in Fried's 2007b work on a set of valence-reducing patterns, on possessiveness (Fried 2009a), and also in a diachronic context (Fried 2008).

A relatively simple example of the general idea is provided by a small set of correlative patterns, in English instantiated by the sentences in (4-6); I will abbreviate them as [*as A as N*] patterns:

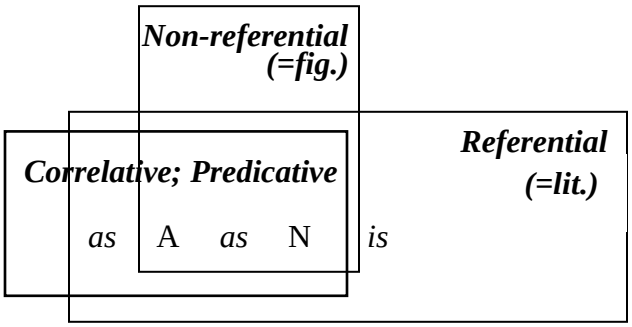
| | | Schematically: |
|---|---|---|
| (4) | *Jack is as old as my brother is.* | *as* A *as* N *is* |
| (5) | a. *Jack is strong as an ox.* | A *as* N |
| | b. **Jack is old as my brother.* | |
| (6) | a. *Jack is as old as my brother.* | *as* A *as* N |
| | b. *Jack is as strong as an ox.* | |
| (7) | **Jack is old as my brother is.* | *_ A *as* N *is* |

The examples in (4-6) are clearly related both in form and the general correlative meaning, as well as in the syntactic function served by the [*as A as N*] pattern: it is used as a non-verbal predicate after a copula, expressing a property of the subject. But each variant is also associated with special features of its own. The one in (4) includes a second instance of the copula (turning the second correlate into a clause) and has only a literal reading (the N is referential). (5a) does not contain the first *as*, prohibits the presence of a second copula (**Jack is strong as an ox is*), and allows only a figurative reading: the N must be non-referential, as confirmed by (5b). Finally, (6) does not have the second copula and can be read both literally (6a) and figuratively (6b). It follows from all this that the presence of the second copula is a clear signal of a literal (i.e., referential) reading of the correlative pattern, while the absence of the first *as* (5) is associated with a figurative (i.e., non-referential) reading only. The configuration in (7) thus fails because it combines two incompatible

properties, one that goes with a non-referential N only (absence of the first *as*) and one that goes with a referential N only (presence of the second copula).

It is desirable to capture the relatedness of the three variants but it would be impossible to arrange them into a hierarchical tree: first, selecting the root node would be a wholly arbitrary decision and second, the variants only display partial overlaps, not the kind of inheritance shown in Figure 1, where the same syntactic configuration is preserved throughout the network. It is more accurate to conceptualize the relationships exemplified in (4-7) as a network of overlapping constructions, a constructional map, shown in Figure 2. The representation here is simplified to the bare minimum, abstracting away from additional details that go hand-in-hand with the difference in referentiality and would, of course, have to be part of the full representation. The present purpose of the picture is to show only that one construction has to be specified as exclusively referential, one as exclusively non-referential, and one is not specified for referential status of the N, thus allowing both interpretive possibilities, while all three of them share the function of expressing a correlative relationship and serving as non-verbal predicates.

**Figure 2.** A partial inheritance network of Correlative constructions




In sum, based on the available research, it seems likely that most often, all of these types of networks will be necessary for a full description and representation of a particular syntactic phenomenon.

## 3. Notational conventions

Constructional literature shows a variety of notational practices, the major ones being the hallmark box-style notation, HPSG-style notation, and Goldberg's notation for argument-structure constructions. This relative freedom can be seen as a by-product of the fact that CxG does not work with any predefined structure that should apply to all constructions, and that there is no fixed set of features that would have to be present in all representations of all types of constructions. In the rest of

this section, I will present the basics of the relatively detailed box-style notation that is used as a way of forcing analytic precision within the Fillmorean strand of CxG. (The present coverage draws on the exposition in Fried & Östman 2004b, to which the interested reader is referred for more in-depth discussion and exemplification of the full notational system.)

### *3.1 Structural relations*

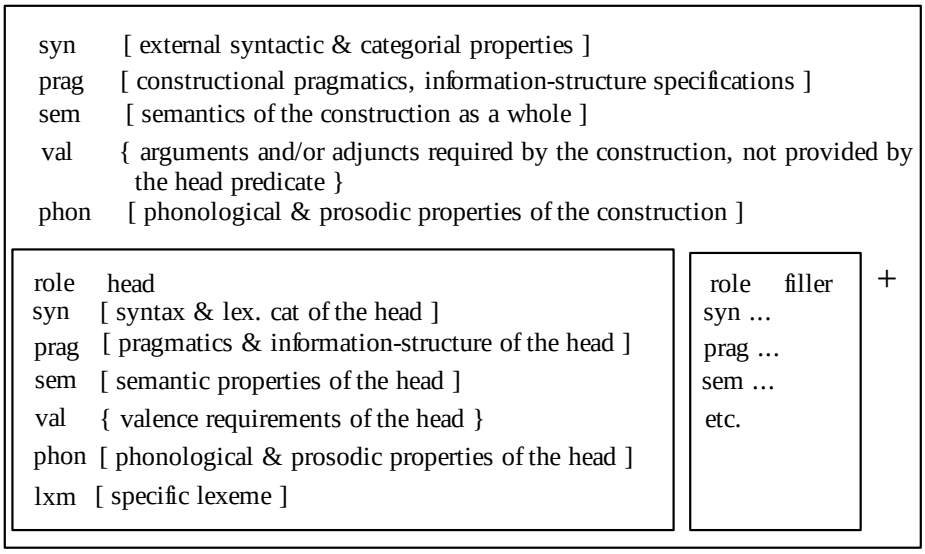
The boxes-within-boxes notation captures hierarchical relations and the linear order of constituents. The notation can be viewed as a more elaborate version of nested brackets. Grammatical constructions that capture very simple syntactic configurations might be more or less replaceable by nested brackets or tree diagrams. However, the point of constructions is to address the empirically supported observation that most grammatical patterns, including some fairly 'simple' ones (such as, say, English determination structures or subject-predicate relations) may require a representation enriched by reference to additional layers of information (semantic, pragmatic, etc.); using boxes is simply a more convenient way of keeping all the information (relatively) transparently organized.

Moreover, CxG makes a systematic distinction between two layers of specification: the holistic, constructional level (a set of constraints on how a given unit fits in larger syntagmatic contexts) and the constraints that apply to its constituents. The former is referred to as the *external* properties of a construction and the latter establishes the *internal* make-up of a construction. For example, the Positive Suggestion construction, instantiated in (1a), would have among its external specifications the unexpected pragmatic force (positive suggestion), while its internal structure would mostly consist of features inherited from the Negative Question construction (which alone would consist of inheritance links to a number of other constructions, such as *do*-support, Subject-Auxiliary Inversion, Imperative, VP, etc.), with certain idiosyncracies imposed explicitly on some of its constituents as features of this construction alone (restriction in tense, no semantic restriction on the head verb, obligatory contraction on the auxiliary, etc.).

A skeletal example of the box notation that in some version appears in all constructional representations is in Figure 3, here showing a headed phrasal construction.[3]

[3] CxG only posits headed structures when such an analysis is warranted by the data. Headedness is not taken as a required feature of phrasal constructions since there are also non-headed structures of various types. A simple and familiar example can be taken from the English coordination structures ([[*tall*] [*and*] [*thin*]], [[*returned to California*] [*and*] [*started a new business*]]), which consists of three elements none of which syntactically dominates the other two.

**Figure 3.** Skeletal structure of constructional representation.




The outer box represents the whole construction, which in this case has two structural daughters (the inside boxes), the head preceding its dependent(s); the 'Kleene plus' symbol following the right daughter indicates that the head expects one or more of these dependents. Each box (outer or inner) will contain various subsets of the types of features listed here generically: *syn*(tactic), *prag*(matic), *sem*(antic), *val*(ence), etc. The ones in the outer box are the external features, relevant to the holistic specification of the construction; the ones in the inside boxes are the features that are associated with individual constituents (internal features). The order in which the features are listed has no theoretical status, although CxG practitioners tend to follow certain general conventions, reflected also in this overview. Finally, let it be noted that just like CxG does not assume the existence of a universal inventory of certain (or all) constructions, not *all* constructions of a given language, let alone cross-linguistically, are expected to list constraints within all the categories shown in Figure 3; for any given construction, only the minimal subsets that are empirically justified for a descriptively adequate generalization about that construction will be specified.

For example, the *val*(ence) statement (to be discussed in section 3.4) at the constructional level will be necessary in the English VP construction, which does not provide a subject slot; or in cases such as applicative constructions, where an additional participant role must be incorporated into the structure of the sentences; etc. On the other hand, a valence statement is not present in the Modification construction since this construction is not concerned with constraints on licensing arguments of predicates. Similarly, the *lxm* specification only applies in lexically partially filled constructions, such as will be shown in section 3.5. And the same holds for all the other categories.

*3.2 Feature structures*

The content of the domains (syntactic, semantic, prosodic...) listed in Figure 3 is presented in the form of attribute-value pairs (enclosed in square brackets), which serve to organize all the grammatically relevant information and to specify unification relationships. The attributes correspond to linguistic categories, each of which is specified for a particular value. Since CxG is an inductively oriented enterprise, the categories/attributes must be motivated by linguistic facts; there is no *a priori* determined set of attributes that would function as universal primitives. Examples of attributes and their values that can be found in existing constructional analyses are given in Table 3; the list is not exhaustive, of course.

**Table 3.** Examples of attributes and their values

| ***Domain*** | ***Attribute*** | ***Values*** |
|---|---|---|
| *Syntactic* | lexical category | n, adj, v, p, … |
| | finiteness | +/- |
| | grammatical function | subj, obj, obl, … |
| *Semantic* | number | sg, du, pl, … |
| | definiteness | +/- |
| | semantic role | agent, patient, goal, … |
| *Prosodic* | prosodic constituent | word, phrase, clitic… |
| | intonation | falling, raising, … |
| | stress | primary, secondary, null |
| *Pragmatic* | activation in discourse | active, accessible, null |
| | register | formal, informal |
| | speech act | question, request, … |
| | genre | informational, argumentative,… |
| | discourse role | theme, rheme |
| | shift in topic | yes / no |

The values are assigned in one of three ways, depending on the nature of the attribute. If the feature is binary (e.g. definiteness, finiteness), the value will be + or -. A non-binary attribute (e.g. lexical category, semantic role) will get its value from a list of possibilities. The list, however, is not a random and freely expandable inventory; its members must make up a coherent set in which each member is defined in relation to other possible members of the set. Finally, CxG allows a value of any attribute, binary or not, to be left unspecified; this is marked by a pair of empty brackets '[]'. For example, in many languages, the members of a Modification construction must agree along any number of features, as illustrated by the Czech examples in (8); throughout the string, all the constituents agree in number, gender and case.

(8) a. *můj* *nov-ý* *román* 'my new novel'
my.NOM.SG.M new.NOM.SG.M novel.NOM.SG.M

| | | | | |
|---|---|---|---|---|
| b. | *moj-e* | *nov-á* | *knih-a* | 'my new book' |
| | my.NOM.SG.F | new.NOM.SG.F | book.NOM.SG.F | |
| c. | *mým* | *nov-ým* | *knih-ám* | '[to] my new books' |
| | my.DAT.PL.F | new.DAT.PL.F | book.DAT.PL.F | |

In order to state this as a generalization independent of any specific instantiations, the relevant categories within that construction will all be marked as [], shown in Figure 4. The underspecification of the lexical category of the modifier (*cat []*) represents the fact that in Czech, this syntactic slot can be filled with items of various categorial value (adjectives, possessive pronouns or adjectives, demonstratives, ordinal numbers, etc.). The 'Kleene plus' symbol again indicates that there can be a whole string of these modifiers. (This notation ignores the fact that some members of the string have to be arranged in a particular order depending on their lexical category but I will not address this issue here; the simplified representation is sufficient for our immediate purposes.)

**Figure 4.** Czech Modification construction

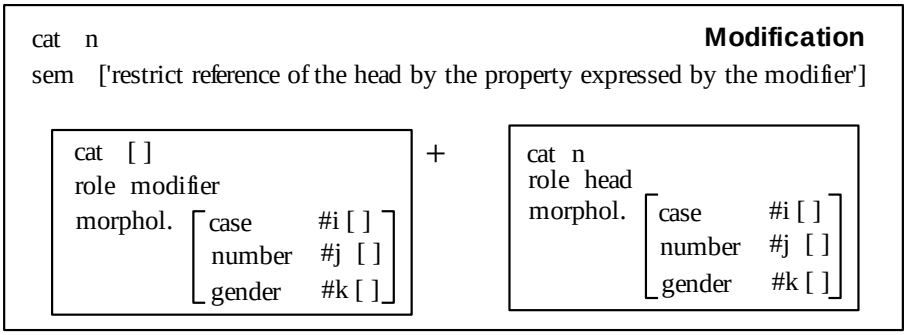



Figure 4 illustrates a few additional properties of the notational system. One, the attribute-value pairs are organized in attribute-value matrices (AVM) if a particular linguistic category requires reference to a cluster of features. Two, the AVMs can be nested; the value of an attribute thus can be also an AVM, not just an individual value. In the Modification construction, the morphological features form a coherent cluster and it is then the cluster (an AVM) that is the value of the attribute *morphol*(ogical categories). And finally, the representation shows one particular use of the co-indexing mechanism (#i, #j, etc.), which is a formal way to keep track of unification relations.

In general, co-indexation marks features that must match or at least must not be in conflict either within a single construction or across constructions; this is at the heart of the unification mechanism, which ensures that pieces of linguistic material that do not match along any number or types of properties will not be licensed as possible constructs. Successful unification comes in two shapes, schematically summarized in (9). Two specifications can unify ("fit together") either if they are identical

in their requirements (9a) or if one is unspecified (9b); in contrast, conflicting specifications (9c) normally cannot unify.

(9) a. [attr *x*] [attr *x*]
b. [attr *x*] [attr []]
c. *[attr *x*] [attr *y*]

Thus, for example, the definite article in English is unspecified for the semantic feature *number*, [num [] ], and can thus combine with any noun, regardless of its grammatical number (sg/pl); this is the configuration in (9b). In contrast, the indefinite article is specified as [num sg] and can thus unify only with a (countable) noun in the singular, i.e. one that has exactly the same specification (9a).

On the other hand, CxG takes language and linguistic structure to be inherently dynamic and as such not immune to constant potential for variability and change. Consequently, strict and absolute unification is not a realistic expectation and, in fact, would contradict one of the basic CxG tenets, namely, that linguistic analysis must be sensitive to the interactional basis of linguistic structure (Fillmore 1974/1981). Constructions are assumed to be stretchable to some degree, and the stretching includes cases where a particular combination, produced and accepted by speakers as a possible utterance, involves a unification conflict. A relatively straightforward case of a conflict in a single feature can be drawn from expressions such as *the London* (*of my youth*) or (*This is*) *a different London* (*from the one I know*). The combination of a determiner and a proper noun should be ruled out under strict unification, since such a combination violates the constraint that only common nouns can fill the slot of the head noun in a regular determination pattern. In formal terms, the noun *London* is specified as [proper +] while the slot of the head noun in the construction must be specified as [proper -], in order to capture the robust generalization that normally we do not say things like *Tomorrow I'm flying to a London* or *The London is one of her favorite cities*. Yet, the conflict evidently need not always result in an ungrammatical structure. At the same time, it is clear that in order for this combinatorial conflict to be accepted by speakers as meaningful and syntactically possible, certain contextual conditions must obtain. Notice that the combination necessarily evokes the image of a kind of partitioning (in this case temporal), as if dividing the entity *London* into discrete phases of its existence, which can be fully individuated and, hence, restrictively referenced one at a time and in a mutual contrast. However, this construal, which is imposed by the determination pattern itself, automatically requires the additional context that explicitly encodes this (otherwise unexpected) restrictive reading of an explicitly determined entity.

This seemingly trivial kind of conflict is instructive in that it highlights a fundamental feature of CxG that sets it apart from other

syntactic theories: grammatical generalizations (i.e. constructions) are treated as functional prototypes in the sense of relatively stable, recurrent patterns shared across a speech community, but not as inviolable 'rules' that result either in a grammatical structure if everything is in full harmony, or in a failure. This conceptual flexibility is cognitively supported by reference to prototype-based categorization and to the goal-oriented nature of normal communication, in which speakers are motivated to interpret even less than perfect matches between the abstract grammatical patterns and the words that fill them in concrete expressions. This, in turn, naturally allows for the often observed fact that there is also a cline in what degree of stretching is likely to be acceptable in a given communicative situation, and at which point the novel combination will be rejected.

The unification relationships exemplified in Figure 4 express grammatical agreement, but the same basic mechanism applies in capturing government (i.e. argument expression), discussed below.

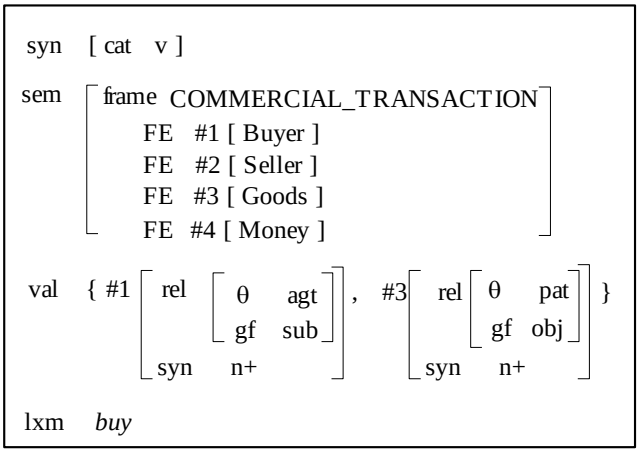
### *3.4 Valence*

In dealing with regular associations between the lexical meaning of predicates (i.e., argument-taking lexemes) and their role in sentence structure, CxG incorporates reference to semantic frames, each of which represents the complete background scene associated with a given linguistic expression: the scene's participants, settings, props, and any other unique semantic features. The scene-based conception of predicate semantics (Fillmore 1977: 73) provides a natural connection between predicate-specific participant roles (roughly comparable to Dowty's 1991 "individual roles") and the more abstract notion of semantic roles, which are generalizations over the specific roles, based on shared linguistic behavior.

Frame-semantic lexical representation of predicates thus may consist of two layers of information: a frame and a valence. The frame contains all the idiosyncratic information about the meaning of a given predicate, while the valence consists of the syntactically minimal set of semantically more abstract roles (agent, patient, theme, path, etc.) that capture the generalized event type instantiated by the predicate. The association between the frame-specific participants and the corresponding semantic roles is not always fully predictable from the frame, as is well known from various alternation phenomena. In schematic representations, the two layers are linked directly for each predicate by co-indexing; the formalization includes grammatically relevant lexical information about a specific lexeme (here *lxm buy*) and – in the case of predicates - a canonical morphosyntactic form in a particular syntactic pattern (e.g. active, passive, antipassive, causative, reflexive, etc.). This is exemplified in Figure 5, with the verb *buy* as it would appear in an active transitive pattern (this particular representation is again a slightly simplified rendition that leaves

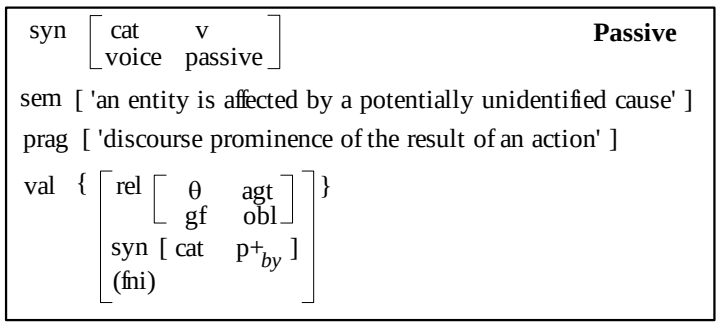
out certain minor details concerning features not discussed in this abbreviated survey). The symbol $\theta$ stands for 'semantic role', *rel* for 'relation', *gf* for 'grammatical function', *n+* for a full NP.

**Figure 5.** Fully specified valence of the English verb *buy*




Predictability in the mappings between semantic roles of arguments and their syntactic function and form in a sentence is captured through linking constructions, which are generalizations about argument realization. The types of links and the level of detail that needs to be spelled out will, to some degree, differ across languages, and the 'form' pole may also involve various categories (grammatical functions, case markers, verbal morphology, prosody), depending on the typological properties of a given language. A simple example of a linking construction would be the English passive, shown in Figure 6; $p+_{by}$ stands for a PP introduced by the preposition *by*, (fni) stands for optional 'free null instantiation', indicating that the agent need not be expressed and when it is not, its interpretation is 'free' (i.e., depends on specific context in which the passive is used). Notice that linking constructions do not specify concrete lexical items; their job is to apply to whole classes of eligible lexemes.

**Figure 6.** English passive linking construction



### *3.4 Instantiation principles*

Structural dependencies – in CxG called instantiation patterns – as well as constraints on linearization patterns are captured by appropriate phrasal constructions; the Modification construction in Figure 4 exemplifies a type of phrasal construction.

Instantiation patterns can be classified into two major types: direct instantiation and 'other'. Direct instantiation means that each constituent of a given phrasal construction corresponds to a discrete syntactic unit in the actual linguistic expression. This will always be the case in modification structures: both the head and the dependent(s) must be physically expressed by an appropriate syntactic unit, and in English this also means that the constituents are expressed 'locally', in the immediate proximity to their phrase-mates. However, in the case of complementation, other types of instantiation must be accounted for as well. CxG works with the following general patterns (at least for English): null instantiation, left-isolation, double instantiation, and co-instantiation.

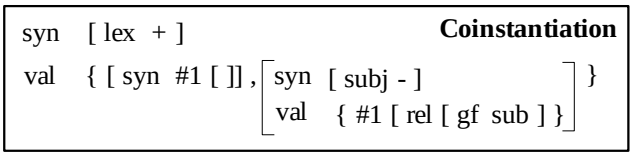
Null instantiation refers to instances in which a valence element that is required by the predicate semantics is left unexpressed in certain environments. The omission in concrete expressions is licensed either by a particular predicate (e.g. the patient argument of *read, eat, cook*) or by a construction, e.g. imperative (licensing a null subject), passive (null expression of the agent), etc. Constructional representations also specify what kind of interpretation is conventionally associated with the unexpressed referent, by attaching the appropriate label to the corresponding valence element (cf. the Passive Linking construction in Figure 6). Indefinite null instantiation (labeled as *ini* in the representations) appears in cases where the referent is some unidentified, indefinite entity whose existence is conventionally understood as the kind of participant required by the predicate in question (e.g. 'reading material' in a sentence such as *He spent the whole morning reading*). Definite null instantiation (*dni*) concerns referents that are present in the discourse and can be assumed by the speaker to be identifiable by the hearer; examples include the null subject of imperatives (a property of a grammatical construction), a null argument of certain predicates (e.g. the frame participant role Contest with the verb *win*, in the sentence *He won*), and the like. Free null instantiation (*fni*), exemplified by the optional agent in the Passive construction is licensed in cases where either definite, indefinite, or generic ('folks in general') interpretation is possible.

Left-isolation patterns (also known as distant instantiation) account for dependencies that correspond, roughly, to *wh*-movement phenomena in the transformational tradition. Thus one of the constructions that together license our examples *Why don't you be the leader* (1a) or *that my colleague made* (2) are left-isolation constructions for forming, respectively, *wh*-questions and relative clauses.

Double instantiation (also known as extraposition) constructions account for patterns in which the properties of a single valence element are distributed over two discrete syntactic units in actual expressions; a single argument thus appears to be instantiated twice. This concerns, for example, sentences such as *It is annoying that they have such short business hours*, in which the semantic content of the subject complement of *annoying* is expressed by a *that*-clause (*that they have such short business hours*), 'extraposed' after the verb, while its syntactic status (subject) is expressed by the sentence-initial *it* (as a syntactic place-holder).

Finally, co-instantiation refers to the opposite configuration, one in which a single syntactic element simultaneously expresses (co-instantiates) two distinct arguments supplied by two distinct predicates; this includes various 'control' phenomena, in the transformational literature known as raising and equi structures. Thus in the example *persuade the children to come* (Table 2), the NP *the children* co-instantiates the object of *persuade* and the subject of *to come*. A general co-instantiation pattern that covers both object and subject control can be formulated as an abstract construction shown in Figure 7. This representation specifies that co-instantiation involves two valence elements – one (#1) is syntactically unspecified (can be subject or object of the main predicate) and the other is a subjectless clause, whose main predicate brings along a subject complement that will be co-instantiated by the first element; this is indicated by the co-indexing. The distinction between 'raising' and 'equi' types will correspond to, respectively, the absence or presence of semantic requirements in the embedded *val*(ence) statement.

**Figure 7.** English Co-instantiation construction




Instantiation issues have been discussed in some detail by various scholars, cf. Kay & Fillmore 1999 on left isolation, Michaelis & Lambrecht 1996 on double instantiation, Fillmore 1986b, Ruppenhofer & Michaelis 2010, or Lambrecht & Lemoine 2005 on null instantiation (the first two for English, the last one for spoken French), or Lyngfelt (2009) on a broad range of control patterns in Swedish.

### *3.5 External vs. internal properties of constructions*

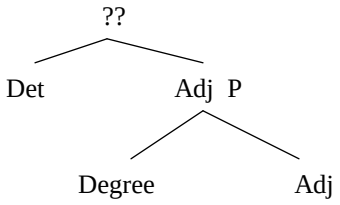
The nested boxes reflect constituent structure, but also allow us to make a principled and systematic distinction between the external properties of a

construction and its internal, constituent-level properties. This distinction is essential for capturing the fact that a complex expression (morphological or syntactic) as a whole may have its own idiosyncratic features that do not follow from the internal composition. The internal and external levels may share certain attributes and/or values, but need not share *all* of them; hence the non-compositionality effects. The non-sharing manifests itself in various ways: there may be a direct conflict between certain requirements of the construction as a whole and the specifications of its constituents, in which case the constructional properties override the constituent-level properties, or some aspect – syntactic, semantic, pragmatic, or a combination of any of these – of the construction is added beyond what a simple concatenation of the constituents contributes. Very often, both of these possibilities co-occur, as in the example of determined proper nouns, where the conflict is not purely between external and internal specifications but between the type of an internal constituent and its lexical filler in actual expressions.

The Positive Suggestion construction (*Why don't you be the leader?* in 1a), presents a conflict between, on the one hand, the function and meaning of the *wh*-expression, the negation, and the syntax of questions and, on the other hand, the positive suggestion interpretation at the constructional level that clearly cannot be attributed to any (subset of) features of the constituents themselves, nor does it arise from a simple concatenation of the constituent meanings. The constructional meaning thus represents an idiosyncratic external contribution that is added independently of the internal specifications. As to how we get from the literal, compositional meaning of a negative *why*-question to this novel interpretation is a separate question, one for diachronic analysis, but from the synchronic point of view, this external/internal discrepancy is fully conventionalized.

A more intricate type of conflict can be illustrated by phrases such as *the poor, the affluent, the hungry, the very naive*, etc. Externally, in larger grammatical patterns, these expressions behave like regular noun phrases. However, this behavior cannot be so readily 'projected' from their internal composition, especially if we keep the analysis at the categorial level, as shown in (10):

(10)

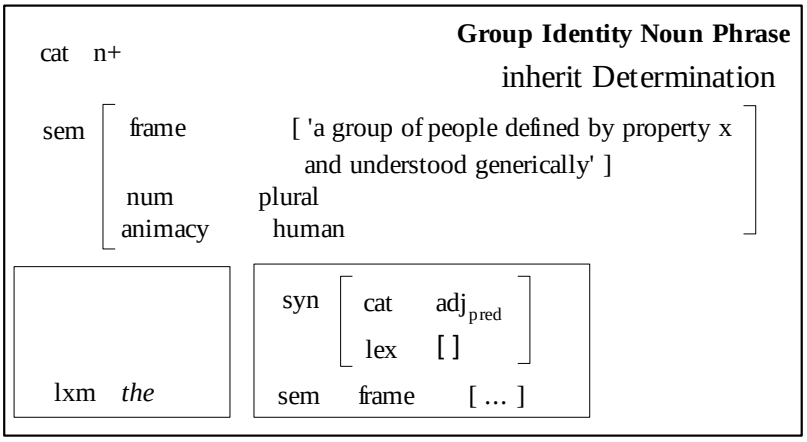



Whether we arbitrarily replace the question marks at the root of the tree by N or by Det, we will fail to capture the true nature of this fully productive, yet somewhat irregular pattern. Treating the whole phrase as a

NP will put its categorial status in conflict with the category of the head, whether we decide to accord the head status to the adjective or to the determiner. And the seemingly obvious (although controversial on other grounds) alternative of treating the phrase as a DP headed by the determiner fails in other respects, since an adequate description of this pattern has to go beyond solving a categorial mismatch across the external/internal dimension, let alone the internal question of headedness. The full challenge becomes apparent when we also consider constructs that have to be ruled out as regular, conventionally expected instantiations of this pattern: **the spacious*, **the expensive*, **a hungry*, **these affluent*, **many naïve*, **poor*, etc. The choice of both the determiner and the adjective is constrained: the former is restricted to the definite article (other determiners, including null, are not part of the conventional usage) and the latter must come from a semantic class denoting properties attributable to human beings; it also appears that the adjective must be one that can be used predicatively (cf. **the main*). The adjectival semantics must be compatible with the idiosyncratic interpretation of the phrases (i.e. the external semantics), which cannot be predicted from the categorial, semantic, or combinatorial properties either of the definite article *the* or the adjectives: the phrase can only be used in reference to people and they are necessarily understood generically and as a group (cf. *The poor have been migrating to this neighborhood* vs. **The poor next door moved in last month*). The group identity manifests itself also formally by plural agreement, which the phrase forces when used as a subject (*The poor were treated with disdain*).

We thus must posit a construction that spells out all these features, as shown in Figure 8; the representation is very slightly simplified for the purposes of this chapter. The point of the representation is to capture the fact that this is a fully productive pattern, which, however, has some unpredictable properties, including its categorial configuration: externally, the phrase plays the role of a noun phrase, through one of the features inherited from (i.e., shared with) the Determination construction that licenses regular NPs, and internally consists of an otherwise unpredictable combination of a determiner and an adjectival phrase. The feature *lex*(ical) *[]* indicates that the adjectival slot may or may not be further expanded by a modifier (e.g. *the truly clueless*).

**Figure 8.** Group Identity Noun Phrase construction




We can also use this construction as an example of a particular place on the continuum of constructions discussed in section 1.2: it is a partially filled syntactic idiom.

## 4. Explanatory potential beyond traditional syntactic analyses

### *4.1 Corpus and text linguistics*

With the growing availability and greater reliability of electronic corpora, CxG research has been increasingly putting emphasis on empirical methods and particularly statistical methods known from corpus analysis. A distinct domain of interest has been the study of collocations; this work has been pioneered by an approach developed by Gries and Stefanowitsch (Gries 2003, Gries & Stefanowitsch 2004, Gries 2005, Gries et al. 2005), who have coined the terms "distinctive collexemes" and "collostructions" in capturing the relative strength in collocational preferences between phrase mates and the degree of conventionalization in these preferences.

The importance of a discourse-related dimension in syntactic analyses was recognized quite early in Fillmore's work on "text semantics/text comprehension" (Fillmore 1974/1981). A more focused attention to the communicative underpinnings of linguistic structure is now rapidly emerging as a very active area of research, drawing also on the advances in certain strands of interactional linguistics and conversation analysis (e.g. Selting 1996, Linell 1998, Fischer 2000, Selting & Couper-Kuhlen 2001). A systematic study of the grammar of spoken language is framed by the hypothesis that a native-like linguistic knowledge and understanding must include recurring conventionally expected socio-pragmatic patterns and structure, not just the knowledge of words and grammatical rules. Work in this domain thus explores the relationship between grammar and interaction, focusing on a number of relevant areas:

structures beyond sentences; the nature and role of non-propositional meanings in spontaneous conversation, as a way of maintaining conversational coherence; interactional properties of linguistic categories; degree of conventionalization in incorporating contextual clues in recurrent grammatical patterning; etc. A representative sample of contextually oriented, corpus-based constructional research can be found in Bergs & Diewald (2009), but also in the work of many other scholars, such as Nikiforidou & Katis (2000), Fischer (2000, 2006a, 2010), Lambrecht (2004), Östman (2005), Fried & Östman (2005), Lindström & Londen (2008), Matsumoto (2008, 2010), Fried (2010a, In press), Antonopoulou & Nikiforidou (2009), Nikiforidou (2010), or Terkourafi (2010).

### *4.2 Language variation and change*

The usage-based orientation of CxG suggests itself also as a link to the study of language variation and change. CxG has only recently started to be tested on diachronic data, but it is becoming evident that constructional analysis can help us be more precise in articulating the *emergence* of grammatical structure and capturing the inherently dynamic nature of language. CxG seems like a useful model for addressing the central problem of diachronic syntax: the gradual nature of linguistic change, which follows from the tension between, on the one hand, discrete, partial transitions occurring in language use and involving specific features of larger patterns and, on the other, new constructions (i.e., clusters of features) that may arise from these partial changes. Interest in constructional analysis as a potentially useful tool has been rising particularly in grammaticalization research; the connection is most explicitly stated and directly explored especially in Traugott's (2003, 2008a, 2008b, 2008c) work. A broad range of diachronic problems have been most recently addressed in Bergs & Diewald (2008) and Leino (2008). An explicitly CxG-based treatment can be found in Fried (2008, 2009b, 2010b); this work examines specifically the representational potential of CxG in capturing the gradualness of syntactic and morphosyntactic changes.

The usefulness of CxG in tracking diachronic shifts consists primarily in three features of the model. (i) Maintaining the distinction between constructions and constructs is relevant to the hypothesis that shifts in grammatical structure originate in language use (one of the basic tenets of grammaticalization theory). A series of partial transitions in an expression may ultimately give rise to a new construction but the changes themselves necessarily originate in constructs (i.e. in actual utterances). (ii) The network-based view of grammar is particularly relevant to capturing diachronic relationships across grammatical forms. It provides a basis for capturing the well-documented layering effects in language change. And (iii), the systematic, theoretically grounded distinction

between external and internal properties of constructions offers a coherent way of resolving the conflict between maintaining a transparent internal structure of a linguistic form and developing new functional associations that result in idiosyncratic form-function pairings, i.e., new constructions.

### *4.3 Typology*

CxG does not operate with any explicitly articulated assumptions about the universality of specific grammatical categories or syntactic patterns, but this does not mean it has no aspirations for uncovering cross-linguistic generalizations or universal properties of language. On the one hand, by not assuming any universal syntactic structure, the model has the flexibility that is needed for capturing typologically diverse grammatical patterns, as demonstrated in CxG-based typological research (e.g. Ohori 2005) and also in detailed studies of various constructions in languages other than English (cf., for example, various papers in Fried & Östman 2004a, Fried & Boas 2005). On the other hand, universal validity may be found in particular *types* of meaning-form patterns and/or in the way constructions map onto a conceptual space; the latter has been explored particularly in Croft's (2001) studies of various grammatical categories that can be organized in networks ("conceptual maps") of related constructions across languages; for a specifically CxG application of the notion, cf. Fried 2007b, 2009a.

### *4.4 Language acquisition*

In CxG, knowing a language with a native-like fluency means knowing (and learning) the constructions of that language. Constructional research has been vigorously pursued in language acquisition, particularly in the work of Goldberg and Tomasello (Tomasello 2003). Their general approach is conceptually closer to the Langackerian conception of constructional analysis but the theoretical foundations are shared across both theoretical variants: language acquisition is hypothesized to crucially depend on cognitive and interactional principles, learning is facilitated by language use in particular communicative and social contexts, and the basic domain of learning is a construction in the CxG sense. The topics that have attracted the most focused attention so far center mostly on the acquisition of verbs and argument structure patterns Brooks & Tomasello 1999, Campbell & Tomasello 2001), but other structures have been working their way into the acquisition research as well (e.g. Diessel & Tomasello 2001). Constructional analyses can be found in L2 acquisition research as well (e.g. Ellis 2003, Ellis & Ferreira-Junior 2009).

According to Goldberg (2006), the usefulness of a constructional approach can be justified on a number of grounds. (i) The learners' reliance on multiple cues (syntactic, semantic, pragmatic, phonetic) in the learning process can be best captured by a multidimensional object, such

as a construction, which can be – at various stages of acquisition – processed at the holistic (external) level as prefab chunks, or as having a transparent internal structure that then aids in a more productive use of language. (ii) Constructions can be shown to have a predictive value in learning sentence meaning. (iii) The learning process suggests a direction from concrete constructs ('exemplars' or 'instances' in the cognitive linguistic terminology) to constructions.

*4.5 Computational applications*

Most recently, CxG has also served as a theoretical starting point for designing computational systems that simulate language development and language interpretation, and that aim at integrating conceptual structure in systems of natural language processing.

One application is known as Fluid Construction Grammar (FCG), which is being developed by Luc Steels and his associates and which extends constructional work into the domain of artificial intelligence (Steels & Kaplan 2002, Steels 2004, 2008, Steels et al. 2005). The main concern of FCG is to develop computer simulations and robotic experiments that study the development of shared grammar across multiple agents. CxG is taken as a grammatical framework best suited to the task for the following reasons: (i) its multidimensional architecture and the unification-based representations; (ii) the shared fundamental assumption about the interactional basis of language evolution; (iii) the expectation that speakers within a single community ('agents' in the robotic experiments) may not always have exactly the same inventories of grammatical constructions; instead, their grammars are assumed to be 'fluid' to some degree.

Another computational extension of mainstream CxG is known as Embodied Construction Grammar (ECG), associated with the work of Bergen & Chang (2005). ECG is a model of dynamic inferential semantics, where the central concept is that of "embodied schemas" (akin to frames). The aim of this model is to develop simulations of the interpretive processes involved in on-line interaction, in which the knowledge of conventionalized structures and meanings (i.e. constructions and words) must be integrated with implicit and open-ended inferences based on situational and interactional context; the latter are generated by the simulations. ECG's focus on the dynamic nature of linguistic behavior thus explicitly takes issue with the notion of static associations between phonological form and conceptual structure as posited in Cognitive Grammar.

## 5. Concluding remarks

CxG belongs in a family of approaches that are based on one fundamental claim about linguistic structure, namely, that the defining properties of a grammatical pattern form a conventional pairing of form and function/meaning. Construction Grammar has now developed into a mature framework with a solid cognitive and functional grounding, an established architecture, and a consistent notational system for developing schematic representations. It is a constraint-based, non-derivational, mono-stratal grammatical model that also seeks to incorporate the cognitive and interactional foundations of language. It is inherently tied to a particular model of the 'semantics of understanding', known as Frame Semantics, which offers a way of structuring and representing meaning while taking into account the relationship between lexical meaning, interactional meaning, and grammatical patterning.

The appeal of Construction Grammar as a holistic and usage-oriented framework lies in its commitment to treat all types of expressions as equally central to capturing grammatical patterning (i.e. without assuming that certain forms are more 'basic' than others) and in viewing all dimensions of language (syntax, semantics, pragmatics, discourse, morphology, phonology, prosody) as equal contributors in shaping linguistic expressions.

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