Article 10: Cognitive Construction Grammar

Hans C. Boas

University of Texas at Austin

1. Introduction

Since the publication of Goldberg's (1995) seminal book *Constructions*, Construction Grammar (CxG) has become increasingly popular and inspired analyses of a wide range of grammatical constructions in different languages (e.g. Michaelis and Ruppenhofer 2001, Barðdal 2008, Iwata 2008, Boas 2010a).[1] In addition, many of Goldberg's insights have influenced research in first language acquisition (e.g. Tomasello 2003, Diessel, this volume), second language acquisition (e.g. Gries & Wulff 2005, Haberzettl 2007, Ellis, this volume), and language change (e.g. Diewald 2007, Closs Traugott 2008, Leino and Östman 2008, Fried, this volume). This chapter outlines the main ideas and organizing principles of Goldberg's (1995) constructional approach, which has come to be known as Cognitive Construction Grammar (CCxG) since the publication of her (2006) book *Constructions at Work*. The chapter is structured as follows. Section 2 discusses the major organizing principles and the architecture of CCxG. Section 3 addresses the organization of constructional knowledge in CCxG. Section 4 compares CCxG with other strands of Construction Grammar to show what ideas they share, and where they differ.

2. What are constructions?

The most basic idea that CCxG shares with other constructional approaches is that a linguistic model should in principle be able to account for all facets of a speaker's knowledge about their language. Another basic idea is that grammatical constructions are the fundamental building blocks of language.[2] This view is in stark contrast to the Chomskyan conception of constructions as mere taxonomic artifacts, useful for description, but without any theoretical status and no

[1] Thanks to Francisco Gonzálvez-García, Seizi Iwata, and Jaakko Leino for extensive comments on earlier versions of this paper. The usual disclaimers apply.

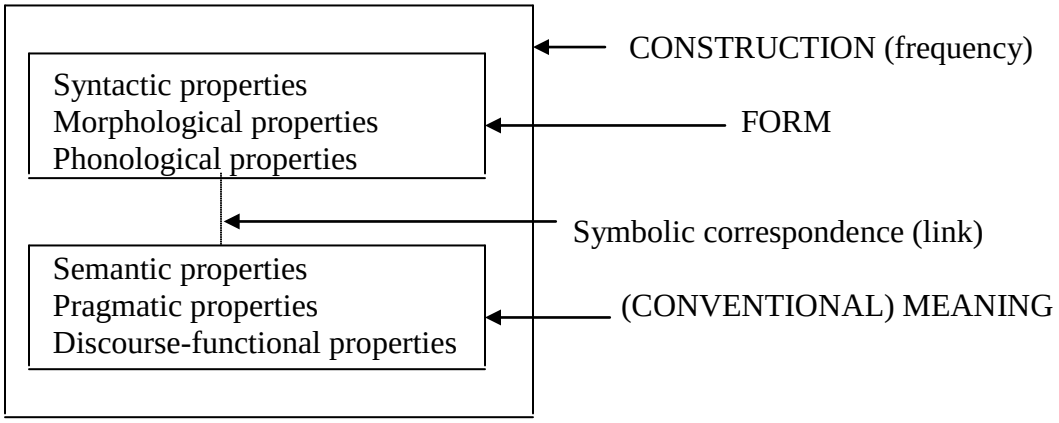
[2] Construction Grammar evolved out of Fillmore's earlier work on Case Grammar (1968, 1977) and Frame Semantics (1982, 1985). In the 1980s, Fillmore and Kay coined the term "Construction Grammar" (Fillmore 1988/1989, Fillmore, Kay & O'Connor 1988, Fillmore & Kay 1995), which – together with Lakoff's (1987) account of existential constructions – can be regarded as the foundation for the different versions of Construction Grammar found today.

explanatory power. On the constructional view, constructions are learned pairings of form and meaning (function), as Goldberg's (2006: 5) definition illustrates.

> Any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist. In addition, patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency.[3]

In this view, all levels of grammatical analysis involve constructions: learned pairings of form with semantic or discourse function, including morphemes or words, idioms, partially filled and fully lexical patterns. This means that even the most general syntactic constructions have corresponding general rules of semantic interpretation (they are symbolic units). The architecture of a construction, coupling a particular form with a specific (conventional) meaning, is as follows.

Figure 1. The symbolic structure of a construction (Croft 2001: 18)



As Figure 1 illustrates, the form of a construction can be associated with different kinds of linguistically relevant information (syntactic, morphological, or phonological). The form side of a construction is linked to its meaning side via a symbolic correspondence link. The term "meaning" is understood to include all of the conventionalized aspects associated with a construction's function, for example that certain obligatory arguments can be omitted, given the proper discourse context, as in sentences like *The tiger killed again* (Goldberg 2002), or that particular types of constructions can be employed to express surprise in a certain pragmatic

[3] For other definitions of constructions, see Goldberg (1995: 4), Croft (2001: 17–21), and Fried & Östman (2004: 18–23).

situation, as in sentences like *What's that fly doing in my soup?* (Kay and Fillmore 1999). The idea that constructions are regarded as learned pairings of form and meaning has several important implications for the architecture of grammar.

2.2.1. Types of constructions

Goldberg's (2006: 18) proposal that "it's constructions all the way down" best characterizes the primary status of constructions in CCxG: whenever it is not possible to predict all of the facts about the use, internal composition, combinatory potential, or meaning of the pattern under study to some independently motivated principles or already known construction(s), it may become necessary to propose a separate construction.[4] When a new construction is posited it is important to keep in mind that it follows the same general architecture of constructions, i.e. a combination of a particular form with a specific (conventional) meaning, as in Figure 1.

Table 1. Examples of constructions, varying in size and complexity (Goldberg 2006: 5)

Morpheme	e.g. *pre-*, *-ing*
Word	e.g. *avocado*, *anaconda*, *and*
Complex word	e.g. *daredevil*, *shoo-in*
Complex word (partially filled)	e.g. [N-s] (for regular plurals)
Idiom (filled)	e.g. *going great guns*, *give the Devil his due*
Idiom (partially filled)	e.g. *jog* <someone's> *memory*, *send* <someone> *to the cleaners*
Covariational Conditional	The Xer the Yer (e.g. *the more you think about it, the less you understand*)
Ditransitive (double object)	Subj V Obj_1 Obj_2 (e.g. *he gave her a fish taco*; *he baked her a muffin*)
Passive	Subj aux VP_{PP} (PP_{by}) (e.g. *the armadillo was hit by a car*)

At the same time, however, constructions differ in their size, complexity, and meaning. For example, the meanings of content words (a very specific type of construction) are typically especially rich as they tend to describe very detailed objects or situations, which can be described

[4] Construction Grammar shares this interest in accounting for all facets of the lexicon and syntax/semantics with other frameworks, such as Valency Theory (Helbig & Schenkel (1971), Helbig (1992), Welke (1988, 2009), Herbst & Kötz-Votteler (2007)) and Pattern Grammar (Sinclair (1987), Hunston & Francis (1999)), and Word Grammar (Hudson (1990), Holmes & Hudson (2004)). For parallels between CCxG and European functional linguistics, see Gonzálvez-García and Butler (2006).

and analyzed with Frame Semantics (Fillmore 1982). In contrast, a more abstract construction such as the passive is comparatively less rich in meaning as it only presents a different perspective of an event and as such encodes a relatively abstract meaning, i.e. a shift in perspective from the active. These brief examples focus on constructions that differ in their size, complexity, and productivity, but do not address the group of constructions most widely discussed in CCxG, namely argument structure constructions.

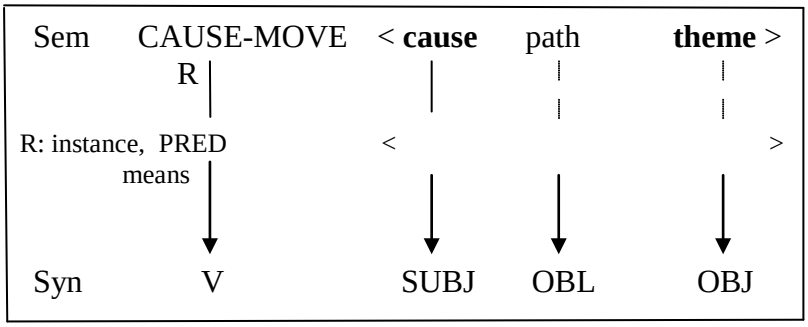
2.2.2. Argument structure constructions

Research in CCxG is perhaps best known for its novel thesis that patterns of argument structure (so-called argument structure constructions) exist independently of lexical argument-taking predicates. In this view, proposed in Goldberg (1995), constructions such as the Ditransitive, Caused-motion, or the *Way*-construction are capable of supplying a verb's semantics with additional arguments. One of the central arguments for positing meaningful constructions that exist independently of the words which instantiate them stems from the wish to avoid the claim that the syntax and semantics of the clause is projected exclusively from the specifications of the main verb (see Goldberg 1995: 224). This view has the advantage of not having to posit implausible verb senses for cases in which verbs occur in an unusual environment as in the following examples.

(1) a. They laughed the poor guy out of the room.
b. Frank sneezed the tissue off the table.
c. Mary urged Bill into the house. (Goldberg 1995: 152)

These sentences cannot be easily explained compositionally because verbs like *laugh*, *sneeze*, or *urge* do not independently encode caused-motion semantics. In CCxG the verbs in (1) are associated with specific lexical semantic information that allows them to integrate (or 'fuse') with the semantics of an argument structure construction, namely the Caused-motion Construction. This fusion in turn licenses the postverbal constituents such as *the poor guy* and *out of the room* in (1a). In other words, although the verbs in (1) contribute their basic meanings, it is the Caused-motion Construction that is itself associated with meaning and therefore contributes the additional arguments providing the final interpretation of caused-motion. Figure 2 illustrates how the constructional semantics (constructional roles) of the Caused-motion construction and the verbal semantics (participant roles) of an intransitive matrix verb are fused in CCxG in order to form the caused-motion interpretation.

Figure 2. Caused-Motion Construction (Goldberg 1995: 163)



The representation of the Caused-motion Construction in Figure 2 consists of three different layers. The top line of the box contains the construction's own meaning (Sem) which lists the semantic arguments of the construction (the constructional roles) and represents their semantic relations with respect to each other. Thus, the caused-motion construction is associated with the semantics 'X CAUSES Y TO MOVE Z.' Solid lines between the semantic roles and roles in the predicate's role array indicate that the semantic role must be fused with an independently existing verbal participant role. Dotted lines indicate that the construction is able to provide additional participant roles. The middle line of the construction contains open slots into which the verb's participant roles fuse and the bottom lists the overt syntactic realizations of the semantic arguments of the combined verb-construction semantics. Roles represented in bold are "profiled" arguments, i.e., entities in a verb's semantics that are obligatorily accessed and function as focal points within the scene, achieving a special degree of prominence (Langacker 1987, cf. Goldberg 1995: 44).

(2) a. sneeze: < **sneezer** >
b. Mary sneezed the napkin off the table.

(2a) shows the structure of lexical entries in CCxG, in this case capturing the fact that *sneeze* is associated with a single participant argument role, the sneezer. The participant role is represented in bold print to reflect the observation that the sneezer role is lexically profiled. In CCxG, as in other constructional approaches, verbs are associated with specific semantic frames (Fillmore 1982). Frame semantic information captures the richness of the various meanings associated with a lexical item, such as references to world and cultural knowledge, experiences, and beliefs (see Petruck 1996, Ziem 2008, and Fillmore and Baker 2010 for details). This is in stark contrast to theories that place heavy emphasis on deriving the semantics of utterances from objective truth

conditions (see Fillmore 1975). In CCxG, the lexical entries of verbs contain participant roles representing the frame semantic information. For example, when *sneeze* fuses with the Caused-motion Construction in Figure 2, the verb *sneeze* contributes the *sneezer* role (sneeze: <**sneezer**>), whereas the construction contributes both a theme and a goal role to the verb's semantics.[5] In other words, *sneeze* specifies the means by which the CAUSE-MOVE relation is achieved whereas the construction provides the rest of the semantics which then in (2b) yields the interpretation of *Mary caused the napkin to move off the table by sneezing*.

The general mechanism of fusing verbs with constructions outlined in the previous paragraphs is the same for other types of argument structure constructions such as the *Way*-Construction (e.g. *They laughed their way into the meeting*), the Ditransitive Construction (e.g. *Joe baked Miriam a cake*), and the Resultative Construction (e.g. *Kim painted the brush to pieces*). In order to avoid unacceptable fusions of verbs with constructions, CCxG posits both construction-specific and more general constraints. For example, to limit the application of the Caused-motion Construction, Goldberg proposes a number of semantic constraints, e.g. that the causer argument can only be an agent or natural force, not an instrument (Goldberg 1995: 165). Crucial to the application of constraints is the notion that expressions are licensed by different constructions (and their constraints) as long as they can be construed as not being in conflict (see Michaelis 2004 on how coercion influences construal). In addition, more general constraints regulate the fusion of verbs with constructions, especially the Semantic Coherence Principle and the Correspondence Principle:

> *The Semantic Coherence Principle:* Only roles which are semantically compatible can be fused. Two roles r_1 and r_2 are semantically compatible if either r_1 can be construed as an instance of r_2, or r_2 can be construed as an instance of r_1. For example, the kicker participant of the *kick* frame may be fused with the agent role of the ditransitive construction because the kicker role can be construed as an instance of the agent role. Whether a role can be construed as an instance of another role is determined by general categorization principles. (Goldberg 1995: 50)

[5] When a verb is lexically associated with two participant roles (e.g., in the case of *push*: <**push**, **pushee**>), the caused-motion construction only contributes one argument role, namely the goal role. In cases in which a verb is lexically associated with three participant roles (e.g., put: < **putter**, **put.place**, **puttee** > (cf. Goldberg 1995: 52)), "the constructional meaning is entirely redundant with the verb's meaning and the verb merely adds information to the event designated by the construction" (1995: 51).

> *The Correspondence Principle:* Each participant role that is lexically profiled and expressed must be fused with a profiled argument role of the construction. (…) If a verb has three profiled participant roles, then one of them may be fused with a nonprofiled argument role of a construction. (…) (Goldberg 1995: 50)

Goldberg's approach has been very successful in accounting for a broad range of argument structure constructions in English, and has also inspired other cognitively-oriented analyses of constructions in language such as Finnish (Leino & Östman 2008, Leino 2010), French (Bergen & Plauché 2001, Lambrecht & Lemoine 2005), Icelandic (Barðdal 2008), Japanese (Fujii 2004), German (Michaelis & Ruppenhofer 2001, Boas 2003, Hilpert 2008), Spanish (Gonzalvez-Garcia 2010), and Thai (Timyam & Bergen 2010).

Goldberg's research on argument structure constructions has attracted a great deal of attention because of the claim that "phrasal patterns are not determined by verbs alone." This claim was made when attention was paid exclusively to verbs alone, in order to account for why one and the same verb may appear in more than one syntactic frame (i.e. argument structure constructions like resultatives). In the generative framework, lexical rule approaches like Rappaport & Levin (1988) and Pinker (1989) are virtually the only possibility for accounting for argument structure constructions. However, after the emergence of Goldberg's theory, even generativists have to concede that Goldberg's account is appealing, and some scholars even introduce theoretical devices which are clearly "constructional": Jackendoff's (1990) Adjunct rules and Levin & Rappaport Hovav's (1998/2001) lexical templates are virtually constructions.

At the same time, a number of studies such as Kay (1996/2005), Nemoto (1998), van der Leek (2000), Boas (2003), and Iwata (2008) argue that the types of abstract meaningful argument structure constructions are often too powerful and have the potential to over-generate unattested sentences. Two points have been shown to be largely responsible for these issues. First, the constraints on the fusion of verbs and constructions are not always sufficient enough to prevent constructions from fusing with certain types of lexical entries. Second, the status of lexical entries is problematic as in most cases the meanings of verbs are represented in terms of relatively sparse frame-semantic information as in (2a) above (see also Boas 2008). To overcome these problems, Nemoto (2005), Boas (2005/2008), and Iwata (2008) propose to pay closer attention to the individual senses of verbs as these are often conventionalized in idiosyncratic ways that defy general constructional generalizations. In this lexical-constructional view, individual verb senses should be regarded as mini-constructions with their own frame-semantic, pragmatic, and syntactic specifications whenever abstract meaningful constructions over-generate. These alternative analyses do not eliminate the need for abstract meaningful

constructions as postulated by Goldberg, but they limit their power substantially. In this view, mini-constructions may form classes with other mini-constructions, establishing inheritance hierarchies containing more and less general patterns with different levels of semantic abstraction. This means that while very broad generalizations are captured by Goldberg-type abstract meaningful constructions, more limited conventionalized patterns are captured by more concrete constructions at various midpoints of the hierarchical network (see also Croft 2003).[6]

2.2.3. Other types of constructions

Following her (1995) book, Goldberg's constructional insights have also been applied to the description and analysis of other linguistic phenomena that lie outside of the scope of "traditional" argument structure constructions, such as constructions that incorporate discourse-relevant information. One such example is the so-called Deprofiled Object Construction (Goldberg 2000), a discourse construction with direct bearing on argument structure. This construction licenses cases in which an argument that is normally associated with the verb is unexpressed due to a combination of its low discourse prominence together with an increased emphasis on the action. In sentences such as *Tigers only kill at night*, the argument of the transitive verb *kill* can be omitted because the argument is not prominent in discourse and therefore needs not to be expressed. In other words, the patient argument of the change of state verb *kill* is neither focal nor topical (cf. Lambrecht 1994), while at the same time the action is emphasized. The Deprofiled Object Construction serves a communicative function by shifting discourse prominence away from the patient argument, effectively licensing its omission. Other examples of constructions incorporating discourse-relevant information include the Nominal Extraposition Construction (e.g. *It's AMAZING the people you SEE here*; Michaelis & Lambrecht 1996), which integrates categories of information structure into grammatical description, the Implicit Theme Construction, which allows theme arguments of emission and contribution verbs to be omitted in certain contexts (e.g. *She donated to the United Way*; Goldberg 2004), and the French Context Focusing *Parce Que* Construction (CFPC) (e.g. (Deulofeu & Debaisieux 2009), whose meaning transcends regular propositional meaning as it belongs to the domain of information processing and the structuring of common ground. Closely related to this line of research are studies of constructions and speech acts, where particular pragmatic conditions influence the licensing of specific constructions such as the *let alone* construction (*Fred won't*

[6] For discussion of the role of abstract schematic constructions, see also Croft (2003), Goldberg & Jackendoff (2004), Iwata (2008), Traugott (2008), Zeschel (2008), and Boas (in press). See also Fillmore et al. (to appear) on current efforts to use descriptive and organizational principles of the FrameNet lexicon (http://framenet.icsi.berkeley.edu) to arrive at a systematic description and analysis of grammatical constructions of different types and levels of abstraction.

order shrimp, let alone Louise, squid; Fillmore, Kay and O'Connor 1988),[7] the WXDY construction (*What's that fly doing in my soup?*; Kay and Fillmore 1999), and the N-*be*-*that*-construction (*the thing is/the point is …*; Günthner 2008) (see also Kay 2004 and Leino, this volume).

While constructional research has focused primarily on the role of semantic, pragmatic, and syntactic factors in licensing constructions, very few studies address the influence of phonological factors. Historically speaking, this tendency may perhaps be explained by the primary focus of constructional research on showing that there exist no strict separation between the lexicon and syntax, semantics, and pragmatics, thereby offering a theoretical alternative to phrase-structure trees in the generative-transformational paradigm. As such, only few accounts have relied on phonological factors for explaining the distribution of constructions. One such example is Lambrecht (1990), who demonstrates how the interpretation of a particular linguistic expression such as *Him be a doctor!?* depends on the prosodic contour conventionally associated with it. In this case, the unusual morpho-syntax of accusative subject and bare stem verb phrase cannot be accounted for by other existing constructions. Instead, it is only acceptable when paired with a particular intonational contour, thereby expressing the speaker's incredulity with regard to some proposition that has just been proposed. Other studies highlighting the influence of phonological factors for licensing constructions include: Michaelis & Lambrecht (1996), who illustrate that examples of nominal extraposition necessarily contain an activation accent falling at some point within the postpredicate NP; Boas (2004), who shows that *wanna*-contraction in English is due to phonological reduction in fast speech, which can be accounted for by a non-modular architecture allowing for simultaneous interaction of syntactic, semantic, pragmatic, and phonological information; and Fried & Östman's (2004) discussion of patterns such as *Is a sauna hot*, whose interpretation depends on the intonation used in pronouncing the string of words, which in turn reflects the licensing by distinct grammatical constructions, i.e. either a question construction or an exclamative construction. These examples show that phonological information may sometimes also be relevant for the licensing of constructions, and as such need to be included in formal representations when necessary.

2.2.4. Interaction of multiple constructions

Unlike to generative-transformational analyses that assume various levels of representation, constructional approaches such as CCxG do not employ derivations to relate representations at

different levels to each other.[8] Instead, there is only one level of representation at which sentences are licensed by different sets of constructions, in effect a "what you see is what you get" model of language. Constructions can be combined freely to form actual expressions as long as they are not in conflict. Consider the sentence *What did Michael send Miriam?*, which involves the combination of a number of different constructions: First, each of the five words are constructions; then there are the VP Construction, the NP Construction, a Subject-Auxiliary Inversion Construction, the WH Construction, and the Ditransitive Construction. When combining different constructions, it becomes obvious that they each fulfill different tasks in constructing sentences. For example, while the VP and NP Constructions combine larger phrases out of individual words (constructions), the WH Construction licenses the argument of the verb *what* in sentence-initial position, and the Ditransitive Construction is understood to encode the grammatical relations by pairing a particular form/function with a particular meaning. The important point here is that all constructions involved combine to form sentences at only one level, and they combine freely because they are not in conflict.[9]

Goldberg's view of constructional interaction has the advantage of being able to relate those surface forms systematically to each other which share certain meanings. For example, Goldberg's (2002) analysis of the locative alternation proposes an alternative to Levin's (1993) account. Where Levin (1993) relied on strictly syntactic criteria to identify semantic verb classes that exhibit similar alternating behavior, Goldberg proposes to take a closer look at how semantically related verbs interact with different sets of argument structure constructions. To this end, Goldberg (2002: 343–344) claims that the overlap in meaning between the alternants in (3a) and (3b) is accounted for by recognizing that there are two sets of constructions that share the meaning of the same verb.

(3) a. Caused-motion construction (e.g., *Pat loaded the hay onto the truck*)
CAUSE-MOVE (cause theme path/location)
load (loader loaded-theme container)

b. Causative construction + *with* construction (e.g., *Pat loaded the truck with hay*)
CAUSE (cause patient) + INTERMEDIARY (instrument)
load (loader container loaded-theme) (Goldberg 2002: 344)

[9] Constructions are not capable of combining freely when they are in conflict, for example the constraints on individual constructions are violated. Consider, for example, **What did Michael send the peace?*, which is unacceptable because *the peace* cannot be construed as an animate recipient argument and hence violates a central constraint of the Ditransitive Construction.

The verb *load*, whose lexical entry consists of the participant roles loader, loaded-theme, and container, is capable of fusing with two sets of constructions, namely the Caused-motion Construction or the Causative + *with* construction. Crucially, the different construals of the verb's participant roles allow for *load* to fuse with different constructions: the loaded-theme role can be construed as either a type of theme role as in (3a), or as a type of intermediary as in (3b), and the container role can be construed as a path/location as in (3a) or as a patient role as in (3b) (cf. Goldberg 2002: 344).[10]

Although analyses couched within CCxG provide stimulating alternatives to non-constructional accounts assuming a modular architecture of grammar (e.g. Chomsky 1965, 1981), they often remain silent when it comes to detailing the specifics of how different constructions interact. More specifically, sentences such as *What did Michael send Miriam?* are licensed by a number of different constructions because these constructions do not conflict and can hence unify (or, "fuse" or "combine"). As already discussed, fusion between verbs and argument structure constructions is possible once construction-specific and more general constraints are met. However, comparatively little work has been done in CCxG on the detailed conditions under which other types of constructions can combine to license more complex sentences involving not only argument structure constructions, but also other types of constructions. Specifying the different roles of unification in constructional interactions has been one of the main foci of a different strand of Construction Grammar called Berkeley Construction Grammar (BCG; also known as Traditional Construction Grammar [Fillmore, this volume]) or Unification Construction Grammar (Goldberg 2006: 213). Within this theory, for example, Fried & Östman (2004: 71) point out that unification phenomena fall into different categories, depending on the types of linguistic relations they represent. They identify five different types of unification, depending on the type of linguistic process involved: agreement (match in inherent properties between structural sisters), government (match in relational properties between head and dependents), semantic linking (match between frame elements and valence elements), semantic integration (semantic unification between structural mother and daughter(s)), and valence expansion (incorporation of non-argument valence elements (adjuncts) between structural mother and daughter(s).[11] Since different constructional approaches share a great deal of

[10] For alternative analyses highlighting the importance of more detailed frame-semantic information to account for alternating behavior among larger number of semantically related verbs, see Nemoto (2005) and Iwata (2008).

[11] For details, see Zwicky (1994), Fillmore & Kay (1995), Kay & Fillmore (1999), Kay (2002), and Fried & Östman (2004).

important insights and mechanisms, it should in principle be feasible to adopt the proposals about constructional interaction made by proponents of BCG into CCxG.

3. Organization of constructional knowledge in CCxG

All constructional approaches to language regard grammar as non-derivational and non-modular, representing knowledge of language in a uniform way. However, there are some important differences in how the various constructional approaches view constructional organization. The following sections present more specifics about how constructional knowledge is organized in CCxG, focusing specifically on motivation, constructional taxonomies, and productivity.

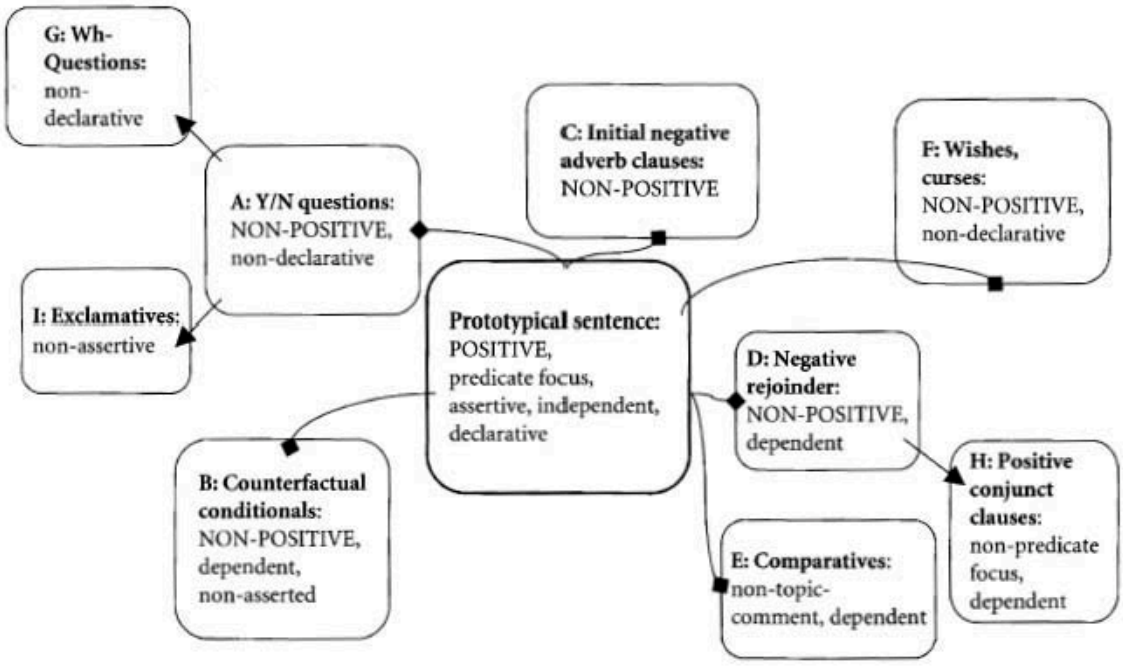
3.1 Motivation

One central point that sets CCxG apart from other constructional approaches is that it aims to offer a psychologically realistic account of language by determining how different more general cognitive principles serve to structure the inventories of constructions. In CCxG, the existence of any construction in the grammar is thought to be by and large motivated by properties of human interaction and cognition, as many facets of grammatical form emerge from social interaction between speakers. This idea comes from several common principles of interaction that are known to have influenced grammatical structures, such as iconicity (Haiman 1983), reasoning through metaphor and metonymy (Lakoff 1987), categorization in terms of prototypes (Lakoff 1987), categorization based on basic experiential patterns (Johnson 1987), and the perception of figure and ground (Talmy 2000). While the idea that interaction between speakers shapes grammar has also become increasingly popular in the general Cognitive Linguistics community (see, e.g., Cuyckens et al. 2003 and Radden and Panther 2004), it is important to remember that motivation *per se* does not have any predictive power, but is instead employed to arrive at plausible scenarios about how a particular linguistic pattern came to be that way. When it comes to grammatical constructions, motivation is often used to account for the fact that formally similar constructions are also often semantically similar. Besides the Principle of Maximized Economy, the Principle of Maximized Expressive Power, and the Principle of No Synonymy (Goldberg 1995: 67), the Principle of Maximized Motivation is perhaps the most influential when it comes to modeling how constructions are organized: "If construction A is related to construction B syntactically, then the system of construction A is motivated to the degree that it is related to construction B semantically …. Such motivation is maximized."

To illustrate the role of motivation in structuring grammar, consider Goldberg's (2006: 166–182) analysis of Subject-Auxiliary Inversion (SAI) constructions, which include yes/no questions,

(non-subject) wh-questions, counterfactual conditionals, initial negative adverbs, wishes/curses, exclamatives, comparatives, negative conjuncts, and positive rejoinders. Previous accounts such as Fillmore (1998) and Newmeyer (2000) focused exclusively on formal properties shared by these constructions, without paying much attention to their semantic and pragmatic properties. Goldberg claims that such analyses only stipulate the form of SAI without being able to arrive at further predictions or generalizations. To support her argument, she points out that there exists a systematic difference in form (subject-auxiliary inversion) which signals a systematic difference in function (a distinction from prototypical (positive) sentences). This leads her to argue that the constructions exhibiting SAI naturally form a coherent functional category that has conventionalized extensions radiating out from a central core, as illustrated in Figure 3, where the partial semantic overlap metonymically motivates the syntactic correspondences between the various SAI constructions.

Figure 3: Functional category of SAI constructions with prototypical sentence as its prototype and markedness links motivating each of the extensions from the prototype (Goldberg 2006: 179)



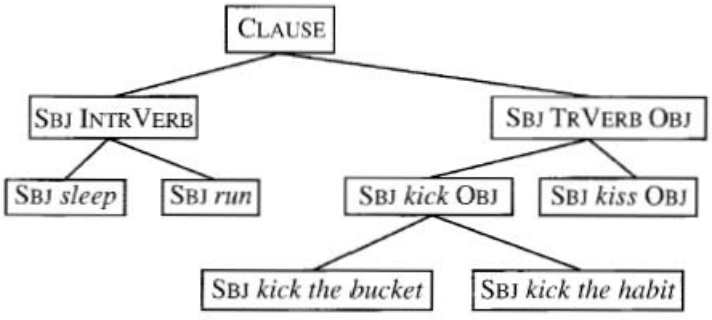
The prototype of SAI constructions is assumed to be a “non-prototypical sentence”, a generalization that is not directly instantiated by SAI constructions. In Goldberg’s view, SAI constructions are different from other types of constructions in that they share a dominant feature of being non-positive (and non-declarative). In Figure 3, this non-positive feature is shared by

each of the extensions from the prototype (indicated by markedness links (curved lines)), thereby motivating them. Figure 3 also shows that constructions which do not share this non-positive feature such as wh-questions (G) are motivated by constructions that share it, such as yes/no questions (A). Goldberg's discussion of SAI constructions suggests "that functional motivations often underlie seemingly idiosyncratic facts of grammar" (2006: 181). By appealing to motivation as an explanatory factor, CCxG thus makes it possible to account for semantic and formal overlaps of constructions. Closely related to the concept of motivation is another organizational principle of CCxG, namely that constructions with related forms and functions are linked to each other in a default inheritance hierarchy.

3.2 Networks and inheritance hierarchies

Following Langacker (1987: 63–76), CCxG regards constructions as forming a structured inventory of a speaker's knowledge of the conventions of their language, and not a random collection of exceptions and irregularities. To model the relations between constructions, taxonomic networks are posited where each construction constitutes a node in the network that forms a continuum from the fully concrete to the highly schematic. Inheritance hierarchies are one crucial feature of taxonomic networks in CCxG in that they allow broad generalizations to be captured by higher-level constructions which are inherited by other constructions. At the same time, subregularities are captured by positing constructions that are at various midpoints of the hierarchical network. The existence of such networks is assumed to be the result of categorization where both generalizations and more specific conventional instances are stored in a network during language processing (for details, see Goldberg 2006: 54–64). Figure 4 illustrates a partial taxonomic hierarchy ranging from very specific to very schematic.

Figure 4: Taxonomic Hierarchy (Croft & Cruse 2004: 264).[12]



[12] For ease of exposition, only the constructions' syntactic (form) side is represented.

At the bottom of the hierarchy we find two partially filled idiomatic constructions, *kick the bucket* and *kick the habit*, which typically exhibit the same argument structure pattern as general uses of transitive *kick*, which is located one level higher in the hierarchy. The idiomatic constructions at the bottom are said to inherit more general properties such as verb inflection, phonological realization, and certain specifications regarding the subject (it should be animate) from its mother construction. Transitive *kick*, in turn, inherits its argument structure pattern from the more schematic transitive verb phrase, which in turn inherits properties from the more general clause construction.

CCxG assumes that inheritance in networks can be partial, while other strands of CxG assume that it must be complete (see Lakoff (1987: 492), Goldberg (1995: 73), and Kay (2000: 20)). Goldberg's notion of partial inheritance has the advantage that it allows for systematic exceptions among specific instances of a category.[13] For example, all verbs in English share a certain regular set of morphological properties: the regular way of forming past tense forms in English involves a construction that combines *–ed* with another construction, namely the root of verbs. This implies that every time we encounter a verb we would expect its past tense form to have an *–ed* suffix, just like we would expect its third person singular form to have an *–s* attached to its root. Thus, the verb node at the top of the taxonomic hierarchy of verbs is linked to all constructions which can fuse with verbs. Further down in the hierarchy we find sub-classes of verbs that are linked to the top node via instance links. However, since irregular verbs may not occur with *–ed* in their past tense form, their entries (represented in the form of constructions) block inheritance because it conflicts with more specific information, i.e. the irregular past participle form.[14] In this connection, Lakoff (1987: 483–487) develops a related proposal that regards grammar in general as a radial category, in which the schematic and more regular constructions constitute prototypes while more specific and idiosyncratic constructions are located at the periphery and are inherit properties from more central instances of constructions.

Another way in which CCxG differs from other constructional approaches is how it regards the relations between constructions in taxonomic hierarchies. Based on the idea that constructional organization follows similar principles as conceptual categories, CCxG posits a variety of links between constructions. One such link is the so-called "subpart link", which shows that one construction is a proper subpart of another construction and exists independently. An example is the Intransitive Motion Construction (e.g. *Kim ran*), which is related to the Caused-motion Construction (e.g. *Kim ran Pat off the street*) by a subpart link (Goldberg 1995: 78). Another link

[13] It is also possible that some constructions exhibit multiple inheritance which helps capture the fact that instances of some construction types seem to resist being uniquely categorized in a natural way (Goldberg 1995: 97). See also Michaelis & Lambrecht (1996: 237–238), Croft & Cruse (2004: 276), and Goldberg & Jackendoff (2004: 563).

is the "instance link", which shows that a construction is a special case of another construction in the sense that it is a more fully specified version of the other construction. An example thereof is a particular sense of *drive* as in *Kim drove Fred crazy/mad/bonkers/up the wall*, which occurs only in the Resultative Construction, and which is linked to it by an instance link (Goldberg 1995: 79–81; see also Goldberg & Jackendoff 2004: 535–536).

Based on key insights from Lakoff's (1987) analysis of *there*-constructions, CCxG also posits a particular type of inheritance link, namely metaphorical extension inheritance links that represent particular metaphorical extensions between constructions. For example, Goldberg (1995: 81–89) argues that the Resultative Construction (e.g. *Joe kicked Bob black and blue*)[15] is a metaphorical extension of the Caused-motion Construction (e.g. *Joe kicked the bottle into the yard*), where the metaphor "Change of State as Change of Location" accounts for the relation between the semantics of the two constructions. While the Resultative Construction inherits the syntactic specifications of the metaphorical extension from the Caused-motion construction, it is still a distinct construction with its own set of constraints (see Goldberg 1995: 87–99, 164–174, 193–197).[16]

Another important construction link in CCxG is the so-called polysemy link, which represents relations between subtypes of constructions that exhibit the same syntactic specifications but differ in their semantics. An example is Goldberg's (1995: 75) analysis of the Ditransitive construction, which has a central sense of "X CAUSES Y TO RECEIVE Z" (e.g., *Joe gave Sally the ball*) associated with particular verb classes such as verbs that inherently signify acts of giving (e.g., *give*, *pass*, *hand*), verbs of instantaneous causation of ballistic motion (e.g., *throw*, *toss*, *slap*), and verbs of continuous causation in a deictically specified direction (e.g. *bring*, *take*, etc.). In addition, the Ditransitive has a total of five extended senses which are each linked to the central sense by polysemy links, which inherit the syntactic construction schema from the prototype, and where the sense extensions are also associated with specific verb classes: (1) Conditions of satisfaction imply "X CAUSES Y TO RECEIVE Z" (verbs of giving with associated satisfaction conditions, e.g., *Joe promised Bob a car*), (2) "X CAUSES Y NOT TO RECEIVE Z" (verbs of refusal, e.g., *Joe refused Bob a cookie*),[17] (3) "X ACTS TO CAUSE Y TO RECEIVE Z at some future point in time" (verbs of future transfer, e.g., *Joe bequeathed Bob*

[16] Boas (2003: 94–97) argues that there is no need for a metaphorical extension link between the Caused-motion and the Resultative Constructions, because a verb's ability to occur with either pattern is a property that is lexically associated with each individual verb without a construction having to add additional arguments to its semantics. See also Kay (2005) for similar arguments.

a fortune), (4) "X ENABLES Y TO RECEIVE Z" (verbs of permission, e.g., *Joe permitted Chris an apple*),[18] and (5) "X INTENDS TO CAUSE Y TO RECEIVE Z" (verbs involved in scenes of creation and verbs of obtaining, e.g., *Joe baked Bob a cake*). Positing constructional polysemy has a number of advantages, such as not having to posit lexical rules in order to account for sense extensions of verbs whose various senses are not predictable on general grounds and must be conventionally associated with the construction. Put differently, instead of postulating verb sense shifts in terms of lexical rules (Pinker 1989) or event structure augmentations (Rappaport Hovav & Levin 1998), the different types of Ditransitive Constructions exist independently of the particular lexical items that instantiate them. The constructional view reflects the general idea that a set of constructions does not consist of independent entities that exhibit irregular organizational patterns, but is instead a "highly structured lattice of interrelated information" that "display prototype structures and form networks of associations" (Goldberg 1995: 5).[19]

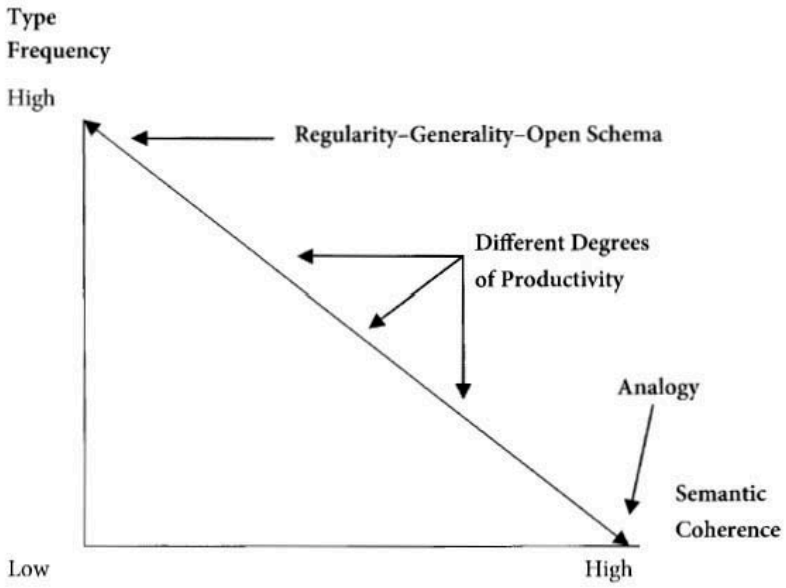
3.3 Frequency and productivity

CCxG is usage-based in that it allows both instances and generalizations to be captured in terms of fully articulated schematic networks including low-level schemas (Langacker 1987, Barlow & Kemmer 2000, Kemmer, this volume). In this view, it is also possible that patterns occurring with sufficient frequency are stored as constructions alongside more general linguistic generalizations even when they are fully compositional and predictable (Bybee & Hopper 2001, Goldberg 2006, Bybee, this volume). In CCxG, frequency is also important for accounting for a construction's productivity, i.e. the speaker's ability to extend argument structure constructions to new verbs and to avoid overgeneralizations. The idea to use frequency to account for a construction's (potential) distribution comes from research in morphology showing that type frequency determines the degree of entrenchment of a schema (Bybee 1985). It is measured in the context of a construction to determine how many different items occur in the various schematic slots of a construction. Determining a construction's type frequency is important

[19] Boas (2003: 97–104) proposes to do away with constructional polysemy because – leaving the notion of motivation aside – there is no need for it as the relevant syntactic frames and polysemy patterns are directly associated with verb classes, individual verbs, and their lexical semantic networks (see also Croft 2003 and Boas 2008, 2010b). On this view, constructional distribution can be accounted for on the basis of verbs alone, without having to rely on a variety of related argument structure constructions. Kay (2005) makes a similar point by proposing that the notion of constructional polysemy is largely redundant because many of the distinctions in entailments follow from the semantics of the verb alone. Instead, Kay (2005: 76–87) develops three maximal Recipient constructions to replace Goldberg's six senses of the Ditransitive Constructions. For additional positions on constructional polysemy, see Wierzbicka (1988: chapter 5), Jackendoff (1996: 100), Croft (2001: 117), Croft & Cruse (2004: 274), and Goddard (2001: 132–140).

because increased type frequency has been shown to directly correlate with a construction's ability to occur with novel items. For example, the *Way* Construction (Goldberg 1995: 199–218) is rather productive as it appears with a very extensive number of verbs, while the Resultative Construction is considerably more limited with respect to the types of verbs with which it can occur (Goldberg & Jackendoff 2004, Boas 2005, Jackendoff, this volume). To capture this state of affairs, construction descriptions would thus also include information about the type frequency for the verb slot, in addition to more general semantic constraints (see, e.g., Goldberg 1995: 129–138; 2006: 98–99). Other important aspect influencing a construction's productivity are token frequency, which determines the degree of entrenchment of individual substantive word forms (see Croft & Cruse 2004, Bybee, this volume), degree of openness (i.e. the variability of the items occurring in a particular pattern), and statistical pre-emption (the repeated witnessing of the word in a competing pattern) (Goldberg 2006: 93).[20]

Figure 5: The productivity cline (Barðdal 2008: 172)



More recently, Barðdal's (2008) study of case and argument structure constructions in Icelandic has shown that productivity is best regarded as a function of type frequency, semantic coherence, and the inverse correlation between the two. Based on historical and psycholinguistic data, Barðdal proposes the productivity cline in Figure 5 where constructions located at the top are not

[20] See also Stefanowitsch (this volume) for quantitative corpus-linguistic methods for systematically analyzing the relationships between words and the grammatical patterns in which they occur.

only the most productive constructions (and occur with high type frequency), but are also the most general and regular. Constructions lowest in type frequency can either exhibit a low or a high degree of semantic coherence. Barðdal's proposals are inspiring because they make it possible to regard both full productivity and analogy as "two sides of the same coin, not different in ontological status, only different in degree" (Barðdal 2008: 173).

4. Differences between CCxG and other strands of Construction Grammar

CCxG shares a great deal with other strands of Construction Grammar, such as the central role of constructions, the idea that the architecture of language is non-modular and non-derivational, and that constructions are learned on the basis of input. At the same time, there are some important differences that are indicated by the label *cognitive*, signaling the close connection to Cognitive Grammar (CG) and Cognitive Linguistics in general (Broccias, this volume), as well as Radical Construction Grammar (RCxG) (Croft, this volume). These approaches are all usage-based, place heavy emphasis on psychological plausibility, employ Cognitive Semantics (construal, a dynamic view of meaning in context, etc.), regard motivation as a central concept, and develop only relatively sparse formalizations.

One major aspect that sets CCxG apart from Sign-based Construction Grammar (SBCG) (Sag 2010, to appear; Michaelis, this volume) and the framework inspiring it, Berkeley Construction Grammar (BCG) (Fillmore & Kay 1995), concerns the goal of offering a psychologically plausible account of language by determining how various general cognitive principles serve to structure the inventories of constructions. Whereas in CCxG the existence of constructions in the grammar are thought to be motivated by more general properties of human interaction and cognition, BCG and SBCG do not emphasize the role of motivation. In this connection, most work in BCG and SBCG is aimed at finding maximal generalizations without any redundancy. This means that if a particular expression can be accounted for on the basis of constructions already known to exist, then there is no need to postulate a separate construction. Similarly, BCG and SBCG are not concerned with frequencies of constructions. In contrast, CCxG takes a strong usage-based view of the role of frequency and the status of item-specific instances, leading to the idea that even fully regular patterns may be stored alongside more abstract schematic constructions when they occur with sufficient frequency (for details, see Croft & Cruse (2004: 308–318), Goldberg (2006: 45–65), and Bybee (this volume)).

Another key difference is the role of formal explicitness and maximal generalizations. CCxG has not focused on rigid formalizations of linguistic insights, as it seeks to represent linguistic knowledge in such a way that it can interface transparently with theories of processing, acquisition, and historical change (Goldberg 2006: 215). To this end, formalization in CCxG is

kept to a minimum and typically takes the form of boxed diagrams representing argument structure constructions as in Figure 3 above, together with constraints in prose specifying the semantic and pragmatic conditions under which a construction may fuse with a verb. The advantage of this approach is that it is relatively flexible and does not impose any stringent formalization. A possible drawback is that such a type of formalization may sometimes be a bit vague about some issues. In contrast, BCG has traditionally been concerned with detailed unification-based formalisms. Each construction is represented in terms of an Attribute-Value Matrix (AVM) where each attribute can have at most one value (for details, see Kay & Fillmore 1999, Fried & Östman 2004, Fillmore, this volume). Sometimes such detailed formalizations are thought of as too rigid because they make it difficult to capture detailed lexical semantic properties (cf. Goldberg 2006: 216). However, SBCG, combining key insights from BCG and Head-driven Phrase Structure Grammar (Pollard & Sag 1994), offers a theory of constructional meaning because it assumes that combinatoric constructions are directly associated with interpretive and use conditions, expressed by semantic and pragmatic features (Michaelis, this volume). More recently, Fillmore and his associates have been developing a unified analysis that regards constructions as a natural extension of the lexicon in SBCG. Using the same formalism employed for representing lexical entries in FrameNet (Fillmore et al. 2003, Fillmore & Baker 2010, http://framenet.icsi.berkeley.edu), constructions also have the ability to evoke semantic frames to different extents and at different levels of schematicity (Fillmore, Lee-Goldman, and Rhodes, to appear).

5. Conclusions

This chapter presented the main organizing principles of CCxG as developed by Goldberg. While research in CCxG is most prominently known for the central role of argument structure constructions, this chapter has shown that other types of constructions also play a pivotal role in Goldberg's framework. What is perhaps most intriguing about constructional approaches in general is that while they share a great deal of general concepts and principles, they also have quite distinctive views regarding psychological plausibility, the role of motivation, and the importance of rigid formalizations (or the lack thereof). While on the surface such differences may seem rather significant it is important to remember that the different constructional approaches do not present any inherent and systematic contradictions when it comes to the organizing principles of language. Most often, researchers simply differ in what they see as the importance of a given aspect of constructional organization. Such preferences are often a matter of personal choice and interest. For example, when it comes to formalization we have seen that CCxG (like RCxG) does not go into too many details while BCG and SBCG go through great lengths to provide a detailed and rigid notation that leaves relatively little space for any other interpretations than the one captured by their particular formalism. It is exactly these differences

that keep constructional research so vibrant: not only can construction grammarians choose their preferred method for finding and expressing their linguistic insights. At the same time, many useful insights from CCxG can in principle be "translated" into the notationally more stringent formalisms employed by BCG and SBCG (and vice versa) because these different constructional approaches share a common base of concepts and principles. To this end, research in CCxG is certain to continue generating exciting insights.

References

Barðdal, Johanna (2008) *Productivity. Evidence from case and argument structure in Icelandic*. Amsterdam/Philadelphia: John Benjamins.

Barlow, Michael, and Suzanne Kemmer (2000) *Usage-based models of language*. Stanford: CSLI Publications.

Behrens, Heike (2009) Konstruktionen im Spracherwerb. *Zeitschrift für Germanistische Linguistik* 37: 427–444.

Bergen, Ben, and Madelaine Plauché (2001) Voilà voilà: Extensions of deictic constructions in French. In Alan Cienki, Barbara Luka, and Michael Smith (Eds.), *Conceptual and Discourse Factors in Linguistic Structure.* Stanford: CSLI Publications.

Boas, Hans C. (2003) *A constructional approach to resultatives*. Stanford: CSLI Publications.

Boas, Hans C. (2004) You *wanna* consider a Constructional Approach to *Wanna*-Contraction? In M. Achard and S. Kemmer (eds.), *Language, Culture, and Mind,* pp. 471–491. Stanford, CA: CSLI Publications.

Boas, Hans C. (2005) Determining the Productivity of Resultative Constructions: A Reply to Goldberg & Jackendoff. *Language* 81(2): 448–464.

Boas, Hans C. (2008) Determining the structure of lexical entries and grammatical constructions in Construction Grammar. *Annual Review of Cognitive Linguistics* 6, 113–144.

Boas, Hans C. (ed.) (2010a) *Contrastive studies in Construction Grammar*. Amsterdam/Philadelphia: John Benjamins.

Boas, Hans C. (2010b) The syntax-lexicon continuum in Construction Grammar: A case study of English communication verbs. *Belgian Journal of Linguistics* 24: 58–86.

Boas, Hans C. (In press) Zum Abstraktionsgrad von Resultativkonstruktionen. In S. Engelberg and A. Holler (eds.), *Zwischen Lexikon und Grammatik*. Berlin/New York: Mouton de Gruyter.

Bybee, Joan (this volume) Exemplars and constructions.

Bybee, Joan and Paul Hopper (eds.) (2001) *Frequency and the emergence of linguistic structure*. Amsterdam/Philadelphia: John Benjmanins.

Chomsky, Noam (1965) *Aspects of the theory of syntax*. Cambridge, Mass.: MIT Press.

Chomsky, Noam (1981) *Lectures in Government and Binding*. Dordrecht: Foris Publications.

Closs Traugott, Elizabeth (2008) Grammatikalisierung, emergente Konstruktionen und der Begriff der "Neuheit." In: A. Stefanowitsch and K. Fischer (Eds.),

Konstruktionsgrammatik II: Von der Konstruktion zur Grammatik, pp. 5–32. Tübingen: Stauffenburg Verlag.
Croft, William (2001) *Radical Construction Grammar*. Oxford: Oxford University Press.
Croft, William (2003). Lexical rules vs. constructions: a false dichotomy. In H. Cuyckens, T. Berg, R. Dirven, & K.-U. Panther (Eds.), *Motivation in Language: Studies in honour of Günter Radden,* pp. 49-68. Amsterdam/Philadelphia: John Benjamins
Croft, William and Alan Cruse (2004) *Cognitive Linguistics*. Cambridge: Cambridge University Press.
Cuyckens, Hubert, Thomas Berg, René Dirven, and Klaus-Uwe Panther (2003) *Motivation in Language. Studies in Honor of Günther Radden*. Amsterdam/Philadelphia: John Benjamins.
Deulofeu, Henri-José, and Jeanne-Marie Debaisieux (2009) Constructions and context: When a construction constructs the context. In A. Bergs and G. Diewald (Eds.), *Contexts and Constructions*, pp. 43–62. Amsterdam/Philadelphia: John Benjamins.
Diessel, Holger (2007) Komplexe Konstruktionen im Erstspracherwerb. . In K. Fischer and A. Stefanowitsch (Eds.), *Konstruktionsgrammatik: Von der Anwendung zur Theorie,* pp. 39–54. Tübingen: Stauffenburg Verlag.
Diewald, Gabriele (2007) Konstruktionen in der diachronen Sprachwissenschaft. . In K. Fischer and A. Stefanowitsch (Eds.), *Konstruktionsgrammatik: Von der Anwendung zur Theorie,* pp. 79–104. Tübingen: Stauffenburg Verlag.
Fillmore, Charles J. (1968) The case for case. In E. Bach and R.T. Harms (eds.), *Universals in linguistic theory*, pp. 1–88. New York: Holt, Rinehart and Winston.
Fillmore, Charles J. (1975) An alternative to checklist theories of meaning. *BLS* 1: 123–131.
Fillmore, Charles J. (1977) The case for case reopened. In P. Cole (ed.), *Grammatical Relations* (Syntax and Semantics 8), pp. 59–81. New York: Academic Press.
Fillmore, Charles J. (1982) Frame Semantics. In Linguistic Society of Korea (Ed.), *Linguistics in the Morning Calm*, pp. 111-138. Seoul: Hanshin.
Fillmore, Charles J. (1985) Frames and the semantics of understanding. *Quadernie di Semantica 6*(2), 222-254.
Fillmore, Charles J. (1988) The mechanisms of 'Construction Grammar'. *BLS* 14: 35–55.
Fillmore, Charles J. (1989) Grammatical construction theory and the familiar dichotomies. In R. Dietrich and C. Graumann (Eds.), *Language processing social context*, 17–38. North Holland: Elsevier Publishers.
Fillmore, Charles J. (1999). Inversion and constructional inheritance. In G. Webelthuth, J.-P. Koenig, and A. Kathol (Eds.), Lexical and constructional aspects of linguistic explanation, pp. 113–128. Stanford: CSLI Publications.
Fillmore, Charles J. (this volume) "Traditional Construction Grammar"
Fillmore, Charles J. and Colin Baker (2010)). A frames approach to semantic analysis. In: B. Heine & H. Narrog (Eds.), *The Oxford Handbook of Linguistic Analysis,* 313–340. Oxford: Oxford University Press.
Fillmore, Charles J. and Paul Kay (1995) *Construction Grammar*. Manuscript, University of California, Berkeley.
Fillmore , Charles J., Chris R. Johnson, and Miriam R.L. Petruck (2003) Background to FrameNet. In: *International Journal of Lexicography* 16(3): 235-250.

Fillmore, Charles J., Russell Lee-Goldman, and Russell Rhodes (in press): Sign-based Construction Grammar and the FrameNet Constructicon. In: H.C. Boas & Ivan A. Sag (Eds.), *Sign-based Construction Grammar*. Stanford: CSLI Publications.

Fillmore, Charles J., Paul Kay, and Mary C. O'Connor (1988) Regularity and idiomaticity in grammatical constructions: The case of 'let alone.' In: *Language* 64: 501–538.

Fried, Mirjam (this volume) Principles of constructional change.

Fried, Mirjam, and Jan-Ola Östman (Eds.) (2004): *Construction Grammar in a Cross-language Perspective*. Amsterdam and Philadelphia: Benjamins.

Fujii, Seiko (2004) Lexically (un)filled constructional schemes and construction types: The case of Japanese modal conditional constructions. In M. Fried and J.-O. Östman (eds.), *Construction Grammar in a cross-language perspective*, pp. 121–156. Amsterdam/Philadelphia: John Benjamins.

Hunston, Susan and Gill Francis (1999*) Pattern Grammar*. Amsterdam/Philadelphia: John Benjamins.

Goddard, Cliff (2000) A problem of definition. In Y. Ravin and C. Leacock (Eds.), Polysemy, 129–151. Oxford: Oxford University Press.

Goldberg, Adele (1995) *Constructions: A Construction Grammar approach to argument structure*. Chicago: University of Chicago Press.

Goldberg, Adele (2000) Patient arguments of causative verbs can be omitted: the role of information structure in argument distribution. *Language Sciences* 34 503–524.

Goldberg, Adele (2002) Surface generalizations: an alternative to alternations. *Cognitive Linguistics*.

Goldberg, Adele (2004) Argument realization: The role of constructions, lexical semantics and discourse factors. In J.-O. Östman & M. Fried (eds.), *Construction Grammars: Cognitive Grounding and Theoretical Extensions*, pp. 17–44. Amsterdam/Philadelphia: John Benjamins.

Goldberg, Adele (2006) *Constructions at Work*. Oxford: Oxford University Press.

Goldberg, Adele and Ray Jackendoff (2004) The English resultative as a family of constructions. *Language* 80(3): 532–568.

Gonzálvez-García, Francisco, and Chris Butler (2006) Mapping cognitive-functional space. *Annual Review of Cognitive Linguistics* 4: 39–96.

Gonzálvez-García, Francisco (2010) Contrasting constructions in English and Spanish: The influence of semantic, pragmatic, and discourse factors. In H.C. Boas (Ed.), *Contrastive Studies in Construction Grammar*, pp. 43–86. Amsterdam/Philadelphia: John Benjamins.

Gries, Stefan T., and Stefanie Wulff (2005) Do foreign language learners also have constructions? Evidence from priming, sorting, and corpora. *Annual Review of Cognitive Linguistics* 3:182–200.

Günthner, Susanne (2008) Die "die Sache/das Ding ist"-Konstruktion im gesprochenen Deutsch – eine interaktionale Perspektive auf Konstruktionen im Gebrauch. In: A. Stefanowitsch and Kerstin Fischer (Eds.), *Konstruktionsgrammatik II – Von der Konstruktion zur Grammatik*, pp. 157-178. Tübingen: Stauffenburg Verlag

Haberzettl, Stefanie (2007) Konstruktionen im Zweitspracherwerb. In K. Fischer and A. Stefanowitsch (Eds.), *Konstruktionsgrammatik: Von der Anwendung zur Theorie*, pp. 55–78. Tübingen: Stauffenburg Verlag.
Haiman, John (1985) *Natural syntax: iconicity and erosion*. Cambridge: Cambridge University Press.
Helbig, Gerhard (1992) *Probleme der Valenz- und Kasustheorie*. Tübingen: Niemeyer.
Helbig, Gerhard, and Wolfgang Schenkel (1971) *Wörterbuch zur Valenz und Distribution deutscher Verben*. 2nd edition. Leipzig: Bibliographisches Institut.
Herbst, Thomas, and Karin Kötz-Votteler (2007) *Valency. Theoretical, descriptive and cognitive issues*. Berlin/New York: Mouton de Gruyter.
Hilpert, Martin (2008) *Germanic future constructions*. Amsterdam/Philadelphia: John Benjamins.
Hudson, Richard (2000) *English Word Grammar*. Oxford: Blackwell.
Hudson, Richard, and Jasper W. Holmes (2004) Constructions in Word Grammar. In J.-O. Östman & M. Fried (eds.), *Construction Grammars: Cognitive Grounding and Theoretical Extensions*, pp. 243–272. Amsterdam/Philadelphia: John Benjamins.
Hunston, Susan, and Gil Francis (1999) *Pattern Grammar*. Amsterdam/Philadelphia: John Benjamins.
Iwata, Seizi (2008) *Locative Alternation. A lexical-constructional approach*. Amsterdam/Philadelphia: John Benjamins.
Jackendoff, Ray (1990) *Semantic Structures*. Cambridge, Mass.: MIT Press.
Jackendoff, Ray (1997) Twistin the night away. *Language* 73: 532–554.
Jackendoff, Ray (this volume), Formal CxG: Constructions in the Parallel Architecture.
Jacobs, Joachim (2008) Wozu Konstruktionen? *Linguistische Berichte* 213: 3–44.
Johnson, Marc (1987) *The body in the mind: the bodily basis of meaning, imagination, and reason*. Chicago: University of Chicago Press.
Kay, Paul (1996) *Argument Structure: Causative ABC-Constructions*. Manuscript. University of California at Berkeley.
Kay, Paul (2000) Comprehension deficits of Broca's aphasics provide no evidence for traces. *Behavioral and Brain Sciences*, 23(1): 40-41.
Kay, Paul (2004) Pragmatic aspects of constructions. In L. Horn and G. Ward (Eds.), *The Handbook of Pragmatics*, pp. 675–700. Oxford: Blackwell.
Kay, Paul (2005) Argument structure constructions and the argument-adjunct distinction. In M. Fried and H.C. Boas (eds.), *Grammatical Constructions. Back to the Roots*, pp. 71–100. Amsterdam/Philadelphia: John Benjamins.
Kay, Paul, and Charles J. Fillmore (1999) Grammatical constructions and linguistic generalizations: The 'What's X doing Y?' Construction. *Language* 75, 1–33.
Kemmer, Suzanne (this volume) Usage-based CxG.
Lakoff, George (1987) *Women, fire, and dangerous things: what categories reveal about the mind*. Chicago: Chicago University Press.
Lambrecht, Knud (1990) 'What me worry?' Mad magazine sentences revisited. BLS 16: 215–228.

Lambrecht, Knud (1994) *Information structure and sentence form: a theory of topic, focus, and the mental representation of discourse referents*. Cambridge: Cambridge University Press.

Lambrecht, Knud, and Kevin Lemoine (2005) Definite null objects in (spoken) French: A Construction-Grammar account. In: M. Fried and H.C. Boas (Eds.), Grammatical Constructions. Back to the roots, 13–56. Amsterdam/Philadelphia: John Benjamins.

Langacker, Ronald (1987) *Foundations of Cognitive Grammar I: Theoretical Prerequisites*. Stanford: Stanford University Press.

Leino, Jaakko (2010) Results, cases, and constructions: Argument structure constructions in English and Finnish. In H.C. Boas (Ed.), *Contrastive Studies in Construction Grammar*, pp. 103–136. Amsterdam/Philadelphia: John Benjamins.

Leino, Jaakko (this volume) Information structure.

Leino, Pentti, and Jan-Ola Östman (2008) Language change, variability, and functional load: Finnish genericity from a constructional point of view. In J. Leino (Ed.), *Constructional Reorganization*, pp. 37–54. Amsterdam/Philadelphia: John Benjamins.

Levin, Beth (1993) *English Verb Classes and Alternations*. Chicago: University of Chicago Press.

Levin, Beth. and T.R. Rapoport (1988) `Lexical Subordination. In *Proceedings of the 24th Annual Meeting of the Chicago Linguistic Society*, 275–289.

Michaelis, Laura (this volume) Sign-based Construction Grammar.

Michaelis, Laura, and Knud Lambrecht (1996) Toward a construction-based theory of language function: The case of nominal extraposition. *Language* 72: 215–247.

Michaelis, Laura, and Josef Ruppenhofer (2001) *Beyond alternations: A constructional model of the German applicative pattern*. Stanford: CSLI Publications.

Nemoto, Noriko (1998) On the polysemy of ditransitive save: The role of frame semantics in Construction Grammar. *English Lingusitics* 15: 219–242

Nemoto, Noriko (2005) Verbal polysemy and Frame Semantics in Construction Grammar. In: M. Fried and H.C. Boas (Eds.), *Grammatical Constructions. Back to the roots*, pp. 118–136. Amsterdam/Philadelphia: John Benjamins.

Newmeyer, Frederick (2000) Language form and language function. Cambridge, Mass.: MIT Press.

Petruck, Miriam (1996) Frame Semantics. In J. Verschueren, J.-O. Östman, J. Blommaert, and C. Bulcaen (Eds.), *Handbook of Pragmatics*, pp. 1-13. Amsterdam and Philadelphia: Benjamins.

Pinker, Stephen (1989) *Learnability and Cognition*. Cambridge, MA: MIT Press.

Pollard, Carl, and Ivan Sag (1994) *Head-driven Phrase Structure Grammar*. Chicago: Chicago University Press.

Radden, Günter, and Klaus-Uwe Panther (2004) *Studies in linguistic motivation*. Berlin: Mouton de Gruyter.

Rappaport Hovav, Malka, and Beth Levin (1998) Building Verb Meaning. In M. Butt and W. Geuder (Eds.), *The Projection of Arguments*, pp. 97–134. Stanford: CSLI Publications.

Rappaport Hovav, Malka, and Beth Levin (2001) An event structure account of English resultatives. Language 77: 766–797.

Ruppenhofer, Joseph, Michael Ellsworth, Miriam Petruck, Chris Johnson, and Jan Scheffczyk (2006): *FrameNet II: Extended Theory and Practice*. [http://framenet.icsi.berkeley.edu]
Sag, Ivan (2010) English Filler-Gap Constructions. *Language* 86(3): 486–545.
Sag, Ivan (to appear) Sign-based Construction Grammar: An informal synopsis. In H.C. Boas and I. Sag (Eds.), *Sign-based Construction Grammar*. Stanford: CSLI Publications.
Sinclair, J. (ed.) 1987. *Looking up: An Account of the COBUILD Project in Lexical Computing*. London: HarperCollins.
Timyam, Napasri, and Benjamin Bergen (2010) A contrastive study of the caused-motion and Ditransitive constructions in English and Thai: Semantic and pragmatic constraints. In H.C. Boas (Ed.), *Contrastive Studies in Construction Grammar*, pp. 137–168. Amsterdam/Philadelphia: John Benjamins.
Tomasello, Michael (2003) *Constructing a Language*. Cambridge, Mass.: Harvard University Press.
Van der Leek, Fredericke (2000) Caused-motion and the 'bottom-up' role of grammar. In A. Foolen and F. van der Leek (eds.), *Constructions in cognitive linguistics*, pp. 301–331. Amsterdam/Philadelphia: John Benjamins.
Welke, Klaus (1988) *Einführung in die Valenz- und Kasustheorie*. Leipzig: Bibliographisches Institut (Tübingen: Francke).
Welke, Klaus (2009) Konstruktionsvererbung, Valenzvererbung und die Reichweite von Konstruktionen. *Zeitschrift für Germanistische Linguistik* 37: 514–543.
Wierzbicka, Anna (1988) *The semantics of grammar*. Amsterdam/Philadelphia: John Benjamins.
Zeschel, Arne (2008) Funktionsverbgefüge als Idiomverbände. In A. Stefanowitsch and K. Fischer (Eds.), *Konstruktionsgrammatik II: Von der Konstruktion zur Grammatik*, pp. 263–278. Tübingen: Stauffenburg Verlag.
Ziem, Alexander (2008) *Frames und sprachliches Wissen*. Berlin/New York: Mouton de Gruyter.
Zwicky, Arnold (1994) Dealing out meaning: fundamentals of syntactic constructions. *BLS* 20: 611–625.