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The syntax–lexicon continuum in Construction Grammar

A case study of English communication verbs

Hans C. Boas
The University of Texas at Austin

This paper offers an alternative analysis of Goldberg's (1995) account of communication verbs appearing in the ditransitive construction. Based on a more finely-grained frame-semantic analysis of constructional phenomena, it is shown that generalizations over specific syntactic frames are possible at different levels of semantic abstraction. This, in turn, allows us to make across-the-board generalizations that hold not only between lexical units evoking the same frame, but also between lexical units belonging to different frames at different levels of abstraction. The resulting network of constructions combines Goldberg's proposals regarding the status of abstract-schematic constructions with item-specific knowledge regarding the specific lexical units, with various midpoints in between. This approach has the advantage that there is no need for fusing lexical entries with abstract meaningful constructions, thereby avoiding some of the problems that arise due to the separation of syntax and the lexicon in some constructional approaches.

Keywords: construction grammar, frame semantics, English communication verbs, valency, constructicon

1. Introduction

A hallmark of Construction Grammar (henceforth CxG) is that it does not assume a strict separation between syntax and the lexicon.[1] Instead, construction-based accounts argue for networks of constructions to capture grammatical knowledge of language from the most abstract to the most idiosyncratic patterns (see Fried & Östman (2004: 15–18) and Goldberg (2006: 1–18) for an overview). Recently, however, some analyses have raised empirical problems for current constructional accounts that assume the inseparability between syntax and the lexicon, which

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call the current theoretical status of the inseparability of syntax and the lexicon into question. In fact, Kay (1996), Nemoto (2005), Boas (2008b), and Iwata (2008) have pointed out that many constructional analyses implicitly assume a separation of syntax and the lexicon, and this paper takes Goldberg's (1995) analysis of the ditransitive construction to illustrate this separation in more detail in order to present concrete proposals for how to address and overcome this separation. Supporting data come from English communication verbs such as *tell*, *say*, *speak*, and *question*.

The remainder of this paper is structured as follows. Section 2 discusses how syntax and the lexicon are separated in Goldberg's (1995/2006) constructional model. Section 3 presents some empirical and theoretical problems that such a separation entails for the analysis of grammatical constructions within a broader theory of argument structure. The evidence involves subtle differences in the distribution of syntactic frames with a range of English communication verbs closely related in meaning. Section 4 offers an alternative approach to dealing with the separation between syntax and the lexicon in CxG. Finally, Section 5 concludes and presents suggestions for further research.

2. The separation of syntax and the lexicon in Construction Grammar

Most constructional analyses subscribe to a basic set of underlying hypotheses regarding the organization of linguistic knowledge. These include, among others, the following: (1) speakers rely on relatively complex meaning-form patterns — constructions — for building linguistic expressions;[2] (2) linguistic expressions reflect the effects of interaction between constructions and the linguistic material, such as words, which occur in them; (3) constructions are organized into networks of overlapping patterns related through shared properties; (4) representations of grammatical knowledge do not rely on derivations or multiple levels of representation; and (5) syntax and the lexicon are not strictly separated (Fried and Östman 2004: 12, Goldberg 2006: 5).

For example, Goldberg's (1995/2006) constructional account models lexical entries relative to some particular background frame that designates an idealization of a "coherent individuatable perception, memory, experience, action, or object" (Fillmore 1977: 84). Consider the following lexical entries for verbs such as *bake*, *paint*, and *tell* in (1a)–(1c).

(1) a. bake ‹ **baker**, baked ›
b. paint ‹ **painter**, painted›
c. tell ‹ **teller**, story ›

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The lexical entries for the verbs include information about the participant roles, which are the crucial part of a verb's frame semantics (cf. Fillmore 1982). Bold face indicates profiling, i.e. those roles which "are entities in the frame semantics associated with the verb that are obligatorily accessed and function as focal points within the scene, achieving a special degree of prominence" (Goldberg 1995: 44). In this view, lexical entries of the type in (1) only "make reference to world and cultural knowledge" but do not need to include syntactic information as "the mapping between semantics and syntax is done via constructions, not lexical entries" (Goldberg 1995: 28). To motivate the existence of a ditransitive construction as in *Mary baked Sue a cake*, Goldberg (1995: 141) argues "that aspects of the syntax or semantics of the ditransitive expressions are not predictable from other constructions in the grammar." She proposes that argument structure constructions such as the ditransitive are meaningful entities that pair form with meaning independently of the particular verbs that instantiate them. Thus, the ditransitive construction pairs a specific meaning 'X CAUSES Y TO RECEIVE Z' with a particular form, namely 'Subj V Obj Obj_2', and the ditransitive construction is taken to contribute semantics not attributable to the lexical items involved. This means that when *bake* fuses with the ditransitive construction, the verb provides its participant roles, namely the baker and the thing being baked.[3] Since the verb's baker role can be construed as an instance of the construction's agent role, the two roles are compatible, i.e. the semantics of the verb and the semantics of the construction may fuse (see also Goldberg (2005, 2010) for more specifics about the interaction between verbs, frames, and constructions).

Given the compatibility between *bake* and the ditransitive construction, Goldberg claims that the construction may also contribute its own recipient argument to the predicate's role array. As a result of the verb's fusion with the construction, the agent is realized as the subject, the recipient is realized as the direct object, and the patient is realized as an indirect object. The fusion of the individual verbs in (1) above with the ditransitive construction results in the licensing of ditransitives, as in the following examples.

(2) a. Sally baked her sister a cake. (Goldberg 1995: 141)
b. Joe painted Sally a picture. (Goldberg 1995: 143)
c. Bob told Joe a story. (Goldberg 1995: 143)

One of the major advantages of Goldberg's approach is that it avoids "the claim that the syntax and semantics of the clause is projected exclusively from the specifications of the main verb" (Goldberg 1995: 224). By having argument structure constructions contribute constructional roles to a verb's meaning through fusion it becomes possible to reduce the number of lexical entries and to avoid specific entries expressing only a ditransitive sub-sense. In addition, Goldberg's

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constructional approach has advantages over other analyses such as Pinker's (1989) lexical rule approach or Rappaport Hovav and Levin's (1998) projectionist approach. Lexical rules and event structure templates have been shown to be too coarse-grained because they do not successfully explain why verbs closely related in meaning often exhibit idiosyncratic patterns of multiple argument realization (see Iwata 2002, 2008; Goldberg & Jackendoff 2004; Boas 2006, 2008a for details).

3. Problems for the separation of syntax and the lexicon

The review of Goldberg's constructional approach shows that there are at least two distinct categories of linguistic information that interact with each other, namely lexical entries and argument structure constructions. This suggests a *de facto* separation between syntax and the lexicon, despite her claim that "the lexicon is not neatly differentiated from the rest of grammar" (Goldberg 1995: 4). The interaction between lexical entries and constructions can be problematic if the constraints governing the fusion of the two are not sufficient to rule out unacceptable examples (see Boas (2003, 2008b)). To illustrate this point, consider Goldberg's analysis of the ditransitive construction with communication verbs such as *tell*. She proposes (1995: 148) that "the systematic metaphor of causal events as transfers is just one of several metaphors which license the use of the ditransitive construction. (…) The source domain of each of these metaphors is the central sense of actual successful transfer." More specifically, the conduit metaphor (Reddy 1979) describes "communication *traveling across* from the speaker to the listener. The listener understands the communication upon 'reception'" (Goldberg 1995: 148). According to Goldberg, the conduit metaphor is capable of licensing the following sentences.

(3) a. She told Jo a fairy tale.
b. She wired Jo a message.
c. She quoted Jo a passage.
d. She gave Jo her thoughts on the subject. (Goldberg 1995: 148)

While the role of metaphor in structuring language has been amply demonstrated in the literature, its role in licensing particular argument structure constructions remains a matter of debate (see, for example, Kay 1996; van der Leek 1996, 2000, Nemoto 2005). Another problem is that it is not entirely clear how metaphorical extensions can be systematically restricted to avoid unacceptable sentences such as the following.

(4) a. *Michael advised Collin the best area for running.
b. *She assured Jo her love.

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c. *She informed Jo all the beers she had.
d. *She notified Jo her thoughts on the subject.

The verbs *advise*, *assure*, *inform*, and *notify* in (4a)–(4d) are fairly close in meaning to *tell*, *wire*, and *quote* in (3a)–(3d) in that they describe situations in which an agent (the speaker) successfully transmits a patient (a message) to a recipient (the addressee). Despite the apparent closeness in meaning, the verbs in (4) do not allow the metaphor to license the ditransitive construction in parallel to the verbs in (3). Instead of allowing a ditransitive NP pattern, these verbs systematically require a ditransitive PP pattern, as the examples in (5) demonstrate.

(5) a. Michael advised Collin on the best area for running.
b. She assured Jo of her love.
c. She informed Jo of all the beers she had.
d. She notified Jo about her thoughts on the subject.

Contrasts such as those in (4) and (5) show that the metaphorical extension of the ditransitive construction to verbs closely related in meaning is rather restricted. Further support for this finding comes from Levin's (1993: 202) analysis of different classes of communication verbs in which she points out that only "some of these verbs are found in the dative alternation." Instead of attempting to delineate specific restrictions for the application of the metaphorical extension I propose that these differences are due to subtle meaning differences between verbs. In line with other recent work (Iwata 2002, 2008; Boas 2005a, 2006, 2008a, Nemoto 2005) I claim that Goldberg's meaningful argument structure constructions are too powerful and thus inadequate for capturing the intricate syntactic and semantic differences exhibited by verbs closely related in meaning. Given her system of fusion of verbs with constructions, together with her system of constraints and metaphorical extensions, there does not appear to be a straightforward way of preventing her constructions from over-generating unattested sentences such as those in (4).

I am not suggesting that the constructions posited by Goldberg do not exist (for more, see Section 4 below). Instead, I contend that to account for the subtle differences between verbs such as those in (3) and (4) it is necessary to consider more finely-grained lexical entries than those proposed by Goldberg in combination with her argument structure constructions (see also Boas 2002, 2003). Support for such a view comes from the broader inventory of syntactic frames occurring with English communication verbs. More specifically, what distinguishes the verbs in (3) and (4) is not only their distribution in the ditransitive construction; they also exhibit other syntactic differences, as the contrasts in acceptability in the following examples demonstrate.

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(6) a. Ben told Amy that he wanted a steak.
b. Ben told Amy about his old Honda.
c. Ben told Amy of his decision.
d. *Ben told Amy on his decision.
e. *Ben told Amy against it.
f. Ben told Amy today: "The library is closed tomorrow."
g. Ben said to Amy: "You're the first person I've told."
h. *"Don't drink it too quickly!", Ben had told.
i. *Doctors tell against using cold water on burns.
j. Can you tell as to why this is happening?
k. *They tell protecting small plants from the cold at night.
l. *Some professors tell that students should study more.
m. Ben told them to wait.

(7) a. Ben wired Amy that he wanted a steak.
b. Ben wired Amy about his old Honda.
c. Ben wired Amy of his decision.
d. *Ben wired Amy on his decision.
e. *Ben wired Amy against it.
f. Ben wired Amy today: "The library is closed tomorrow."
g. Ben said to Amy: "You're the first person I've wired."
h. "Don't drink it too quickly!", Ben had wired.
i. *Doctors wire against using cold water on burns.
j. Can you wire as to why this is happening?
k. *They wire protecting small plants from the cold at night.
l. *Some professors wire that students should study more.
m. *Ben wired them to wait.

(8) a. Ben advised Amy that he wanted a steak.
b. Ben advised Amy about his old Honda.
c. ?Ben advised Amy of his decision.
d. Ben advised Amy on her decision.
e. Ben advised Amy against it.
f. Ben advised Amy today: "The library is closed tomorrow."
g. Ben said to Amy: "You're the first person I've advised."
h. "Don't drink it too quickly!", Ben had advised.
i. Doctors advised against using cold water on burns.
j. Can you advise as to why this is happening?
k. They advised protecting small plants from the cold at night.
l. Some professors advise that students should study more.
m. Ben advised them to wait.

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(9) a. Ben notified Amy that he wanted a steak.
b. Ben notified Amy about his old Honda.
c. Ben notified Amy of his decision.
d. * Ben notified Amy on his decision.
e. * Ben notified Amy against it.
f. Ben notified Amy today: "The library is closed tomorrow."
g. Ben said to Amy: "You're the first person I've notified."
h. * "Don't drink it too quickly!", Ben had notified.
i. * Doctors notified against using cold water on burns.
j. * Can you notify as to why this is happening?
k. * They notified protecting small plants from the cold at night.
l. * Some professors notify that students should study more.
m. * Ben notified them to wait.

(6)–(9) demonstrate that *tell*, *wire*, *advise*, and *notify* exhibit a similar distribution with respect to their ability to occur with certain syntactic frames such as [NP V NP PP] (cf. (6b)–(9b)) or complement clauses headed by *that* (cf. (6a)–(9a)). But just because the four verbs exhibit such overlap in syntactic distribution does not mean that such similarities exist across the board. That is, the four verbs differ rather widely as to the types of other syntactic frames with which they occur, or the types of prepositions heading specific PPs. For instance, *notify* is the only verb above that does not permit a *Wh*-complement clause headed by *as to*. Similarly, *advise* is the only verb that occurs with a clause headed by a V-*ing* form in postverbal position. The four verbs also differ with respect to selection restrictions in PPs (compare (6c, d, e)–(9c, d, e)). In my view, these differences cannot be attributed to the various constructions in combination with minimal lexical entries à la Goldberg's because there does not appear to be any detailed information that would allow a construction to fuse with a verb while at the same time preventing that same construction from fusing with a verb closely related in meaning.

4. Meaningful syntactic structures at different levels of abstraction

To overcome these problems I propose that verbs exhibit much finer-grained meaning structures than those outlined by Goldberg (1995, 2006). A more detailed analysis of such meaning structures allows us to arrive at verb-specific constructions that provide a greater level of detail than Goldberg's lexical entries (see also Iwata (2002, 2008), Boas (2003), and Croft (2003)). My proposal, which in principle is compatible with Goldberg's, assumes (as does Goldberg) that what has traditionally been called "the lexicon" is organized in terms of Fillmore's (1985) Frame Semantics.[4] In this theory, word meanings are described in relation to

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semantic frames, that is "schematic representations of the conceptual structures and patterns of beliefs, practices, institutions, images, etc. that provide a foundation for meaningful interaction in a given speech community" (Fillmore et al. 2003: 235). However, in contrast to Goldberg, I adopt Fillmore's (2007: 129) view that the primary unit of analysis at the word level is the lexical unit (LU) (Cruse 1986), that is, a pairing of a word and its meaning (sense). Each sense is thus described with respect to the semantic frame that it evokes (for details, see Petruck 1996 and Fillmore & Baker 2010), and syntactic frames are recorded and analyzed with respect to the LUs with which they occur.[5] The main difference with respect to the implementation of Frame Semantics is that Goldberg could be considered a lumper (see Gonzálvez-García (2008: 350) and Goldberg (2009b)), as she draws on Fillmore's work to defend broad-scale generalizations about frames in terms of cultural units (see Goldberg (2010)). In contrast, I consider myself a splitter when it comes to fine-grained analyses of verb meanings that should be analyzed in terms of the variety of semantic frames they evoke.

4.1 A frame-semantic analysis of communication verbs

To illustrate, consider how the LU *tell* evokes the `Telling` frame in FrameNet, the practical implementation of Frame Semantics (see Fillmore et al. 2003; Boas 2005b, Ruppenhofer et al. 2006, Fillmore & Baker 2010). This frame represents a scenario with different frame elements (FEs) that can be regarded as instances of broader semantic roles such as AGENT, UNDERGOER, INSTRUMENT, etc. Providing detailed definitions for FEs is important as the entirety of FEs comprises the frame description, which in turn represents a schematic arrangement of the situation type that underlies the meanings of semantically related words. The `Telling` frame involves situations in which a SPEAKER addresses an ADDRESSEE with a MESSAGE, which may be indirectly referred to as a TOPIC. An ADDRESSEE is defined as receiving the message from the speaker. The MESSAGE is the communication produced by the speaker. The SPEAKER is the sentient entity that produces the message, and the TOPIC is a general description of the content of the message.

Frames differ in their level of granularity and how they are related to each other. Figure 1 illustrates a small part of the complex ontology of frames from the domain of `Communication`. Various frame-to-frame relations capture semantic relationships between frames, including (1) Inheritance (a child frame is a more specific elaboration of a parent frame), (2) Subframe (used to characterize the different sequential parts of a complex event), (3) Perspective_on (expressing different points of view of an event), (4) Using (when a part of the scene evoked by the Child frame refers to the Parent frame), and others (for more details about frame-to-frame relations please see Petruck et al. (2004) and Ruppenhofer et al. (2006)).

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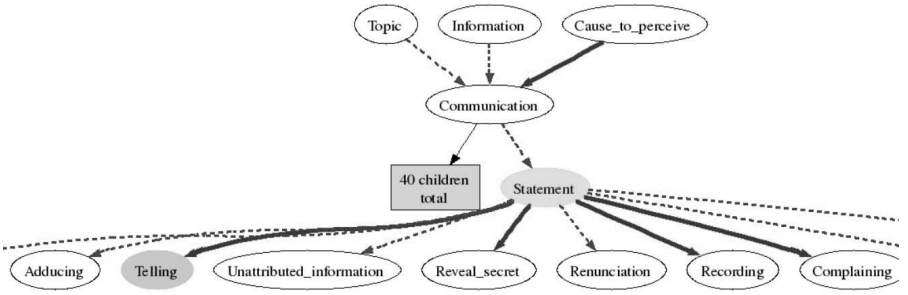

Figure 1. Frame-to-frame relations of `Communication` frames in FrameNet

For example, the low-level frames `Telling`, `Reveal_secret`, `Recording`, and `Complaining`, among others, each inherit from the `Statement` frame (indicated by the thick straight arrows).[6]

A lexical entry in FrameNet consists of three parts: (1) the frame description, (2) the lexical entry report, and (3) annotated corpus sentences from the British National Corpus that exemplify the syntactic realization of FEs in context. Consider, for example, the entry of the LU *tell*.[7] The first part of its lexical entry, the frame description, points to the semantics of the `Telling` frame (see above).

The second part consists of the lexical entry report, which provides a list of how FEs of the `Telling` frame are realized syntactically, and a list of valence patterns illustrating the syntactic distribution of different FEs, also known as FE configurations, or FECs (see Figure 2).[8] The excerpt from the valence table of *tell* in Figure 2 presents a summary based on annotated examples sentences from the British National Corpus as in (9a)–(9c). The valence patterns combine semantic information about the FEs with syntactic information about phrase type (e.g., NP: noun phrase; Sfin: finite sentence, etc.) and grammatical function (e.g., Ext: External; Dep: Dependant; Obj: Object, etc.). Besides the typical abbreviations for phrase types, FrameNet also records so-called null instantiations where FEs are not overtly realized at the syntactic level (hence there is no specification regarding the grammatical function), but rather implicitly understood.

There are three types of null instantiation: Constructional Null Instantiation (CNI) (e.g., *Glancing around at Lee, she said, "tell me about the madam."*), Indefinite Null Instantiation (INI) (e.g., *They had been arguing all day.*), and Definite Null Instantiation (DNI) (e.g. *You must tell me.*). For details, see Fillmore (1986) and Ruppenhofer & Michaelis (to appear).

The third part of the lexical entry is the annotation report. It illustrates how different FEs of the `Telling` frame are realized in context, providing annotated examples from the British National Corpus.[10] The following annotated examples are a small excerpt from the annotation report of the LU *tell* in the `Telling` frame.

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Valence Patterns:

These frame elements occur in the following syntactic patterns:

Number Annotated	Patterns			
3 TOTAL	Addressee	Message	Message	Speaker
(1)	NP Ext	AVP Dep	NP Obj	CNI --
(1)	NP Obj	QUO Dep	QUO Dep	NP Ext
(1)	NP Obj	Sfin Dep	Sfin Dep	NP Ext
96 TOTAL	Addressee	Message	Speaker	
(1)	AVP Dep	NP Obj	NP Ext	
(1)	DNI --	AVP Dep	CNI --	
(1)	DNI --	DNI --	NP Ext	
(1)	DNI --	NP Ext	DNI --	
(1)	DNI --	NP Ext	PP[by] Dep	
(3)	DNI --	NP Obj	NP Ext	

Figure 2. Partial valence patterns of tell in the `Telling` frame[9]

(10) a. [‹speaker› I] already told [‹addressee› you] [‹message› all you need know].
b. [‹speaker› He] tells [‹topic› of the people caught up on the fringes of small wars].
c. [‹speaker› I] have told [‹addressee› Pally] [‹message› to watch out].

The `Telling` frame is also evoked by other LUs such as *advise*, *apprise*, *assurance*, *assure*, *confide*, and *inform*. As such, the lexical entries of these LUs share the same frame description with *tell*, but differ in their lexical entry and annotation reports. Compare, for example, the partial valence information of *inform* in Figure 3 with the partial valence information of *tell* in Figure 2.

I now turn to the question of whether different LUs evoking the same semantic frame realize its FEs similarly at the syntactic level. The first obvious difference is the number of FE configurations (FECs), i.e. the combination of FEs that offer a particular perspective of the event captured by the frame.[11] *Tell* exhibits four FE configurations ([ADDRESSEE, MESSAGE, MESSAGE, SPEAKER], [ADDRESSEE, MESSAGE, SPEAKER], [ADDRESSEE, MESSAGE, SPEAKER, TOPIC], and [ADDRESSEE, SPEAKER, TOPIC]. In contrast, *inform* has six different FE configurations ([ADDRESSEE, MANNER, MESSAGE, SPEAKER], [ADDRESSEE, MANNER, SPEAKER, TOPIC], [ADDRESSEE,

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MEDIUM, MESSAGE, SPEAKER], [ADDRESSEE, MESSAGE, MESSAGE, SPEAKER], [ADDRESSEE, MESSAGE, SPEAKER], and [ADDRESSEE, SPEAKER, TOPIC]).[12] Similar differences exist for other LUs evoking the `Telling` frame: *advise* has three FE configurations, *apprise* has one, *assure* has three, *confide* has two, etc. This comparison shows that LUs evoking the same semantic frame differ significantly with respect to the number of linear (syntactic) configurations of the frame's FEs.[13]

But the differences do not end here. There is also a great deal of variation between the same FEC associated with different LUs. To illustrate this claim, consider how *tell* and *inform* syntactically realize one specific FEC, namely that of [ADDRESSEE, MESSAGE, SPEAKER].[14] Comparing the valence patterns of the two LUs in Figures 2 and 3 we see that there are some similarities in how the FECs are realized syntactically. For instance, both *tell* and *inform* realize the FEC of [ADDRESSEE, MESSAGE, and SPEAKER] as [NP, DNI, CNI] and [NP, PP[about], NP]. Besides this overlap, there also exist considerable differences. For example, *tell* realizes the FEC [ADDRESSEE, MESSAGE, and SPEAKER] as [AVP, NP, NP], while *inform* does not. The same holds for the FECs [DNI, AVP, CNI], [DNI, DNI, NP], [DNI, NP, DNI], and others. Similarly, *inform* syntactically realizes the FEC of

Valence Patterns:

These frame elements occur in the following syntactic patterns:

Number Annotated	Patterns			
4 TOTAL	Addressee	Manner	Message	Speaker
(1)	INI --	AVP Dep	QUO Dep	NP Ext
(1)	NP Obj	AVP Dep	QUO Dep	NP Ext
(2)	NP Obj	PP[in] Dep	QUO Dep	NP Ext
1 TOTAL	Addressee	Manner	Speaker	Topic
(1)	NP Obj	AVP Dep	CNI --	PP[on] Dep
3 TOTAL	Addressee	Medium	Message	Speaker
(1)	NP Ext	PP[via] Dep	PP[of] Dep	CNI --
(2)	NP Obj	PP[in] Dep	Sfin Dep	NP Ext
1 TOTAL	Addressee	Message	Message	Speaker
(1)	NP Ext	Sfin Dep	Sfin Dep	CNI --
33 TOTAL	Addressee	Message	Speaker	
(1)	INI --	QUO Dep	NP Ext	
(4)	NP Ext	DNI --	CNI --	

Figure 3. Partial valence patterns of inform in the `Telling` frame

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[ADDRESSEE, MESSAGE, SPEAKER] in ways that do not occur with *tell*, such as [INI, QUO, NP] and [NP, PPinterrog, NP] among others.

This brief discussion of syntactic variation occurring with two LUs evoking the same semantic frame exemplifies the level of syntactic idiosyncrasy found across the board with other LUs in the `Telling` frame. Similar observations have been made for other semantic frames, such as `Commitment` (Subirats 2009), `Communication` (Subirats & Petruck 2003, Boas 2005b), `Revenge` (Petruck et al. 2004, Petruck 2009), `Risk` (Fillmore & Atkins 1992, Ohara 2009), and `Self_motion` (Fillmore & Atkins 2000, Iwata 2004). The consensus emerging from these studies is that frame-semantic information allows us to characterize semantically coherent classes, both within a single language and cross-linguistically. At the same time, however, these studies also point out that the range of syntactic frames occurring with a given LU is to a certain degree idiosyncratic, and cannot always be automatically deduced from semantic information.

Given this relatively high degree of idiosyncrasy it is clear that a more finely-grained approach to verb meaning and its syntactic realization is needed. This raises the following questions: (1) How do we arrive at possible generalizations over different LUs that evoke the same semantic frame? (2) What are the semantic and syntactic parallels between finely-grained lexical entries and more abstract constructions? (3) Is it possible to capture the types of semantic and syntactic generalizations discussed by Levin (1993) and Goldberg (1995, 2006)? In the following section I seek answers to these questions by adopting insights from Fillmore (2008) and Iwata (2008). This leads me to argue for a unified system of lexical and constructional representations (see also Ruiz de Mendoza and Mairal-Usón (2008)).

4.2 Parallel meaning structures at different levels of semantic abstraction

Determining constructional generalizations on the basis of detailed frame-semantic descriptions should ideally result in a repository of constructions that interface with the types of lexical entries outlined in the previous section. Proposals for such an approach made by Boas (2003), Cruse (2003), Goldberg (2006), and eventually refined by Iwata (2008), argue that constructions should be available at different levels of abstraction.[15] To implement these ideas into our analysis, let us return to our comparison of *tell* and *inform* above, where I argued that the meanings of verbs should be split up to adequately represent the variety of different semantic frames that a verb evokes, as in the Figure below.

Figure 4 illustrates how *tell* evokes (at least) three different semantic frames, `Telling`, `Request`, and `Reporting`, each evoked by a separate LU of *tell*. In contrast, *inform* evokes the `Telling` and `Reporting` frames (two separate LUs), but not the `Request` frame. Finally, *advise* evokes the `Telling` frame (one LU), but

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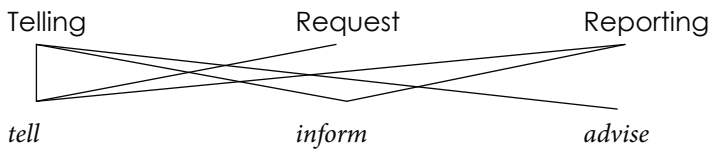

Figure 4. LUs evoking different semantic frames

not the `Reporting` or `Request` frames. This splitting approach taken by Frame Semantics shows that frame-semantic information is taken as the primary means for verb classification. The current FrameNet-type semantics-to-syntax mappings as in Figures 2 and 3 is the level at which there are mappings between the semantics of a semantic frame and specific valence patterns (syntactic frames) (similar to Iwata's (2008) level of individual occurrences). In this view, each syntactic valence pattern presents a particular perspective of the scene described by the frame, an idea that is currently not made explicit by FrameNet. Consider the differences between the following sentences.

(11) a. But they told today: There was no animosity.
b. They told Mary there was no animosity.
c. They told Mary that there was no animosity.
d. They told Mary about there being no animosity.

(11a)–(11d) involve different syntactic frames occurring with *tell* in the `Telling` frame, and thus present slightly different perspectives on a telling event. By recognizing these differences, we are able to explicitly capture the individual semantics-to-syntax mappings of each LU evoking a different frame. Note that this type of information already exists in FrameNet, but the connections between the different syntactic frames and the different perspectives they convey of the telling event are currently not made explicit (see Boas 2003 for an earlier implementation of this concept in terms of so-called mini-constructions).

To overcome this issue, it is necessary to explicitly represent the differences in perspective that syntactic frames make. Consider Figure 5, which shows the various valence patterns realizing the semantics of one of the four different FECs of *tell*, namely [SPEAKER, ADDRESSEE, TOPIC]. This FEC also occurs with other LUs in the `Telling` frame such as *advise*, *inform*, and others.

A comparison of the different valence patterns in Figure 5 shows that the three LUs exhibit some overlap in how they syntactically realize the FEC [ADDRESSEE, SPEAKER, TOPIC], thereby sharing to a certain degree the types of perspective they offer on the telling event described by the `Telling` frame. At the same time, however, there are significant differences in how the perspectives on the event described by the frame are expressed. It is precisely these differences that set not

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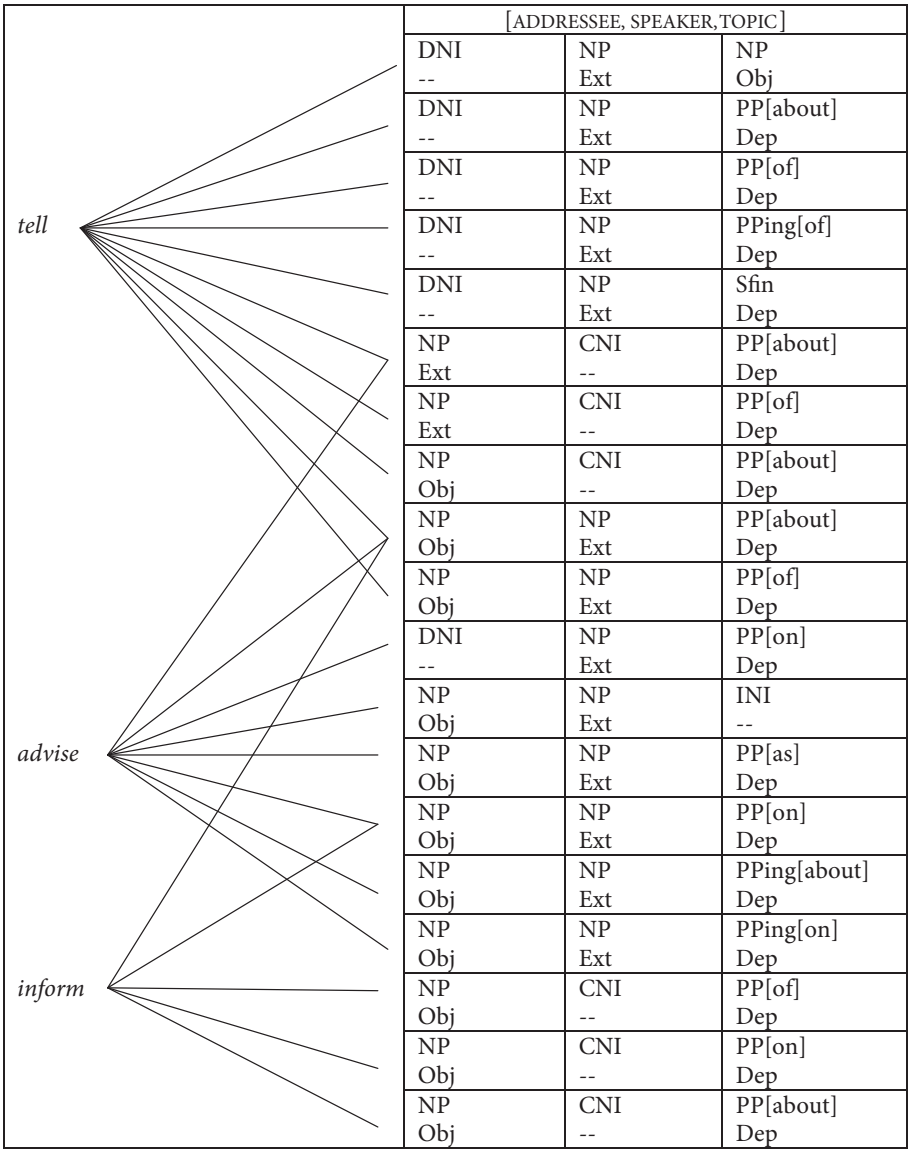

[ADDRESSEE, SPEAKER, TOPIC]		
DNI --	NP Ext	NP Obj
DNI --	NP Ext	PP[about] Dep
DNI --	NP Ext	PP[of] Dep
DNI --	NP Ext	PPing[of] Dep
DNI --	NP Ext	Sfin Dep
NP Ext	CNI --	PP[about] Dep
NP Ext	CNI --	PP[of] Dep
NP Obj	CNI --	PP[about] Dep
NP Obj	NP Ext	PP[about] Dep
NP Obj	NP Ext	PP[of] Dep
DNI --	NP Ext	PP[on] Dep
NP Obj	NP Ext	INI --
NP Obj	NP Ext	PP[as] Dep
NP Obj	NP Ext	PP[on] Dep
NP Obj	NP Ext	PPing[about] Dep
NP Obj	NP Ext	PPing[on] Dep
NP Obj	CNI --	PP[of] Dep
NP Obj	CNI --	PP[on] Dep
NP Obj	CNI --	PP[about] Dep

Figure 5. individual syntactic valencies go with LUs in a particular frame; but not in a different semantic frame. `Tell` frame and various syntactic frames.

only FECs of individual LUs apart from each other, but also the differences in how these FECs are realized syntactically. Similar differences in valence patterns can be observed among other FECs of *tell*, *advise*, and *inform*, as well as other LUs in the `Telling` frame. More generally, these findings can also be replicated for other semantic frames in FrameNet.

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Each of the individual (syntactic) valence patterns associated with an LU in Figure 5 can be regarded as the form side of a mini-construction in the sense of Boas (2003): a conventionalized form-meaning pairing that portrays the event described by the semantic frame from a very specific perspective. At the bottom of Table 1, this is the most specific level of form-meaning correspondence that pairs a specific (semantic) FEC with a single (syntactic) valence pattern, indicated by the arrows. At this level (the LU-level), there are no generalizations to be made. As we have seen in Figure 6, *tell* occurs with a total of ten mini-constructions for the FEC [SPEAKER, ADDRESSEE, TOPIC], *advise* comes to eight, and *inform* comes to five.[16] Note that Figure 5 only represents one of four FECs of *tell* in the `Telling` frame. Considering the remaining three FECs and how their semantics are realized by different valence patterns (see Section 4.1 above), the total number of mini-constructions for *tell* in the `Telling` frame comes to 44, each offering a specific perspective of the same frame.

At a more abstract level we find frame-specific constructions at Frame-level 1. These are constructions which consist of one FEC mapped to the same syntactic valence pattern, and this form-meaning pairing is shared by multiple LUs evoking the same frame. An example is the form-meaning pairing between the FEC [SPEAKER, ADDRESSEE, TOPIC] and the valence pattern [NP, NP, PP[about]], which is shared by *tell*, *advise*, and *inform* in Figure 5. As such, Frame-level 1 represents a generalization over mini-constructions occurring with LUs in the same frame (in this case the `Telling` frame), and hence offers a level of abstraction that is higher than that of the LU-level. It is important to remember that the type of construction, i.e. a pairing of a specific FEC with one valence pattern, remains the same between the LU-level and Frame-level 1. The only thing that sets the two levels apart is the level of abstraction and the number and types of LUs that instantiate this construction.[17]

Next, consider Frame-level 2, a level that is more abstract than Frame-level 1. As seen in Figure 1 above, which shows how frames differ in their level of granularity, FrameNet categorizes the `Telling` frame (Frame-level 1) as inheriting from the `Statement` frame, which is more abstract and should therefore be categorized as Frame-level 2. Of the ten level-1 frames that also inherit from or use the more abstract level-2 `Statement` frame,[18] only the `Judgment_direct_address` frame has LUs like those in the `Telling` frame that pair the FEC [SPEAKER, ADDRESSEE, TOPIC] with the valence pattern [NP, NP, PP[about]]. Consider, for example, *berate*, as in *She berated Moira about the way she was feeding her first child.*[19] Interestingly, none of the LUs of the more abstract level-2 frame (`Statement`) such as *allege*, *contend*, and *address* exhibit a pairing of the FEC [SPEAKER, ADDRESSEE, TOPIC] with the valence pattern [NP, NP, PP[about]]. This means that there are no higher-level generalizations to be made beyond the level-1 frames of `Telling` and

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Table 1. Increasing levels of semantic abstraction, same construction

Level of abstraction	Type of construction (Pairing of a specific FEC with one valence pattern)		Number of LUs	Example
Frame-level 3	Even more abstract	[SPEAKER , ADDRESSEE , TOPIC] ↓ ↓ ↓ [NP, NP, PP[about]]	Multiple LUs evoking higher level frames in the same domain	Communi-cation
Frame-level 2	More abstract	[SPEAKER , ADDRESSEE , TOPIC] ↓ ↓ ↓ [NP, NP, PP[about]]	Multiple LUs evoking higher level frames in the same domain	State-ment/ Questio-ning
Frame-level 1	Frame specific construct-ion	[SPEAKER , ADDRESSEE , TOPIC] ↓ ↓ ↓ [NP, NP, PP[about]]	Multiple LUs evoking the same frame share this mapping	Telling
LU-level	Mini construct-ion	[SPEAKER , ADDRESSEE , TOPIC] ↓ ↓ ↓ [NP, NP, PP[about]]	Only one LU	*tell, inform, advise*

`Judgment_direct_address`. However, there are a number of LUs in the `Questioning` frame, a level-2 sister frame of `Statement`, which also uses a more abstract level-3 frame `Communication` (see Figure 1). Sentences such as *My father grilled us about what we had been doing all week.* and *We questioned her about the theory* illustrate that LUs evoking the `Questioning` frame such as *grill* and *question* exhibit a similar pairing of the FEC [SPEAKER, ADDRESSEE, TOPIC] with the valence pattern [NP, NP, PP[about]].

Finally, consider the level-3 `Communication` frame, the most semantically abstract of the frames depicted in Table 1. Only one LU evoking the `Communication` frame, namely *signal*, also occurs with the same construction, i.e. a pairing of the FEC [SPEAKER, ADDRESSEE, TOPIC] with the valence pattern [NP, NP, PP[about]], as in *She looks up to signal him about backup*. The distribution of the meaning-form pairing [SPEAKER, ADDRESSEE, TOPIC] with [NP, NP, PP[about]] has shown that the same type of construction exists at different levels of semantic abstraction. While the form of the constructions remains the same across all levels, the semantic part changes depending on the LU and the abstractness of the semantics of the frame.

What have we gained from postulating these different levels of abstraction? Returning to our first question from the end of Section 4.1 (How do we arrive at possible generalizations over different LUs that evoke the same semantic frame?), I have shown that generalizations are indeed possible at different levels of semantic

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abstraction (see also Croft (2003) and Iwata (2008) for similar arguments). That is, we can point to valence information as in Figure 5 and show which LUs of a given frame share the same valence patterns, hence offering the same perspective of a frame. This allows us to make across-the-board generalizations that hold not only between LUs evoking the same frame, but also between LUs belonging to different frames at different levels of abstraction. The important point here is that the valence pattern remains constant the more abstract it gets. However, the semantics become more and more abstract. In this connection I have also argued that these types of generalizations need to be hand-coded and do not appear to be predictable on more general grounds.

With respect to our second question (What are the semantic and syntactic parallels between finely-grained lexical entries and more abstract constructions?), I have shown that there are parallels between such lexical entries (so-called mini-constructions) and more abstract levels of representation. As illustrated by Table 1, the same meaning-form pairing (i.e. [SPEAKER, ADDRESSEE, TOPIC] with [NP, NP, PP[about]]) exists at different levels of semantic abstraction with slight variation in meaning, depending on the semantic frame and the individual LU. This approach is different from Goldberg's analysis in that it does not implicitly assume a separation of the lexicon and syntax. Instead, the structures and types of mini-constructions found at the lowest level of the constructional inventory re-occur in similar form but with more abstract meanings at higher levels of the inventory, as illustrated by Table 1. Another difference between Goldberg's analysis and my alternative proposal is that the former employs a top-down method, while the latter eschews a bottom-up method to arrive at constructional generalizations.

4.3 Higher level constructions in the constructicon

I now turn to our third question (Is it possible to capture the types of semantic and syntactic generalizations discussed by Levin (1993) and Goldberg (1995, 2006)?) by discussing syntactic alternations and argument structure constructions. With respect to syntactic alternations, Baker & Ruppenhofer (2002) demonstrate that FrameNet successfully captures alternating syntactic behavior of verbs. For example, the locative alternation (*Lena sprayed paint onto the wall* vs. *Lena sprayed the wall with paint*) is accounted for in terms of two separate frames, `Placing` and `Filling`, each evoked by separate LUs. The alternating behavior of verbs such as *load* and *spray* in FrameNet is thus encoded in terms of the different valence patterns of the two LUs evoking separate frames. While FrameNet provides no explicit link or connection between the valence patterns of the two LUs, there exists a frame-to-frame relation between the frames evoked by the two LUs, i.e., the `Filling` frame uses the `Placing` frame. Thus, syntactic alternations are accounted

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for in terms of frame-to-frame relations and the valencies of pairs of lexical units evoking frames that are semantically related (see also Boas 2008c).

With respect to argument structure constructions Fillmore (2008) argues that the properties of constructions can be catalogued and accounted for by using similar types of data structures as used by FrameNet for lexical annotation. To expand the FrameNet lexicon to also include entries for constructions, so-called constructicon entries contain construction elements (CEs, similar to FEs), i.e. the syntactic elements that make up a construct (the types of structures licensed by a construction). According to Fillmore (2008), constructicon entries also explain the semantic contribution of the construction, specify construction-to-construction relations, and link construction descriptions with annotated sentences that exhibit their types. CEs are named according to their functions in the constructs and provide labels on words and phrases in annotated sentences. Parallel to lexical entries in FrameNet constructicon entries also identify phrase types for constituents that serve as CEs in a construct. In cases where constructions are headed by lexical units (e.g. *way* as in *I talked my way through the room*), grammatical function labels are also relevant. Annotated example sentences with labels for the CEs are also part of a constructicon entry to show the use of the construction. Similar to valence patterns in lexical entries in FrameNet, a constructicon entry also identifies varieties of construct patterns and links these to the annotations. To illustrate, consider the *Ditransitive* construction discussed in Section 2. In line with Fillmore's (2008) proposals, its constructicon entry would look roughly as follows:

(12) *Ditransitive* Construction
  a. Description: A volitional AGENT successfully transfers a PATIENT to a willing RECIPIENT, who receives the patient.
  b. $[NP_1/Subj]_{AGENT}$ $verb^{tgt}$ $[NP_2/Obj_1]_{RECIPIENT}$ $[NP_3/Obj_2]_{PATIENT}$
  c. List of LUs that evoke the Ditransitive construction: v.Giving, signal. Communication, *tell*.Telling, v.Cooking_creation, …
  d. Annotated example sentence for each LU that evokes the ditransitive construction: $[Miriam]_{AGENT}$ passed $[Joe]_{RECIPIENT}$ [the salt]$_{PATIENT}$.

The pairing of CEs with their respective phrase types and grammatical functions in (12b) is similar in structure to that found in FrameNet lexical entries for FEs and their respective phrase types and grammatical functions. Similarly, the verb is the target LU that evokes the construction (though there are other constructions that have no target LU to which the construction can be linked).

(12c) contains a list of LUs that evoke the *Ditransitive* construction, similar to the list of LUs found in a lexical entry in FrameNet. One of the more interesting — and perhaps controversial — aspects of this list is how to decide whether a LU should be included. In some cases, as with the LUs from the Giving frame, this is

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relatively easy to decide: instead of listing individual LUs, we specify that all verbal LUs from the Giving frame may occur with *Ditransitive* syntax (indicated by the "v" preceding the name of the frame). However, such a strategy is not always possible as our discussion of LUs in the Telling frame in Section 3 has shown. This necessitates the inclusion of many individual LUs in the list of construction-evoking LUs in (12c), depending on whether corpus examples can be found that attest their use in this construction. If there are no corpus attestations, a given LU will not appear in the list in (12c).[20] In other words, to arrive at a descriptively adequate account of the types of LUs that can occur in the *Ditransitive* construction it is sometimes possible to state broader types of generalizations by only stating that all LUs evoking a particular semantic frame can occur in a construction. At the same time, however, there are often cases where only a few select LUs of a semantic frame can occur in a construction. In this case, they have to be specifically listed in order to exclude other LUs from the same frame which do not occur in the same construction.

Despite the perceived disadvantage of having lengthy lists of construction-evoking LUs, this method is advantageous when compared to Goldberg's (1995) approach as there is no need to fuse a construction with an entry of a verb, and there are hence no difficulties when one decides whether a given LU can occur in the construction or not. In the case of the Telling frame, LUs such as *tell*, *advise*, and *inform* would be included in this list, but not *apprise* or *confide*.[21] The constructional distribution of LUs can be nicely accounted for in terms of constructional networks à la Langacker (2000) and Bybee (2007). On this view, laid out in more detail in Figure 6 below, both constructional schemas and complex lexical items consist of symbolic assemblies with unit status, often comprising component and composite symbolic structures at multiple levels of organizations (see also Welke (2009) and Boas (to appear) on specifying item-specific constructions alongside abstract-schematic constructions).

Another advantage of this alternative approach is that it integrates nicely with the lower levels of semantic abstraction of constructions outlined in the previous section. For example, the *Ditransitive* construction can be regarded as a highly abstract type of argument structure construction with high-level CEs such as AGENT, RECIPIENT, and PATIENT. The lower-level mini-constructions, and the frame-level 1, 2, and 3 constructions can then be interpreted as more concrete instances of the highly abstract *Ditransitive* construction. Note, however, that while the semantics of the individual semantic frames may be interpreted as concrete subtypes that may inherit from or use the *Ditransitive* construction, this does not automatically mean that all of the LUs of these frames can occur in the *Ditransitive* construction. In other words, while certain semantic frames may be understood as offering a concrete perspective of the Giving frame as expressed by

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Ditransitive syntax, it is still necessary to explicitly list those LUs that can occur in the *Ditransitive* construction. To illustrate, consider Figure 6, which outlines different levels of semantic abstraction in a partial excerpt from the hierarchy of frames.

At the top in Figure 6, the *Ditransitive* construction is coupled with the semantics of the Giving frame, or, to put it differently, the Giving frame is the meaning side of the *Ditransitive* construction. This captures the fact that all (verbal) LUs of the Giving frame can occur with ditransitive syntax as in *Lena handed Samuel the toy*. The arrows pointing down from the Giving frame indicate that lower-level semantic frames such as Communication and Cooking_Creation may use the semantics of the Giving frame (other higher level frames are not discussed here) with some of their verbal LUs, expressed syntactically by ditransitive syntax. Note that the inheritance relation indicated by the arrows only refers to the specific meaning-form pairing of the Giving frame with the syntax of the *Ditransitive* construction. One major difference between the Communication and Cooking_Creation frames is that the former only allows *signal* to occur with ditransitive syntax, but not other verbal LUs such as *communicate*, *convey*, etc. In contrast, no such specifications are listed for the Cooking_Creation frame, indicating that all verbal LUs of this frame may occur with ditransitive syntax (*bake*, *cook*, *make*, *prepare*, etc.) to express the semantics of the Giving frame.

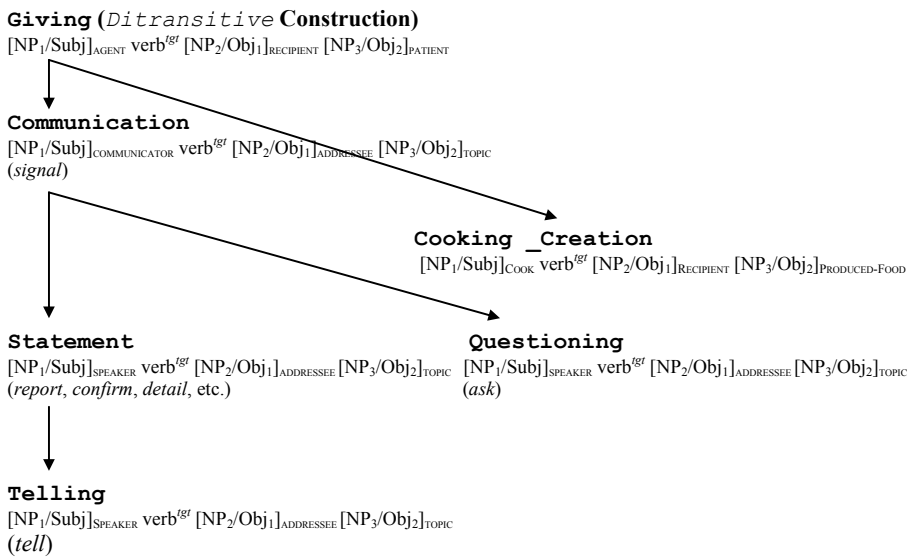

Figure 6. LUs evoking frames at different levels of abstraction that use the Ditransitive construction occurring with the Giving frame.

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The semantics of the Communication frame is in turn used by the less semantically abstract Statement and Questioning frames. Since only a limited number of verbal LUs realize ditransitive syntax with the semantics of their frames, these need to be listed. Finally, only *tell* in the Telling frame is capable of syntactically realizing the semantics of the Telling frame from the perspective of the Giving frame by using a ditransitive syntactic frame.

The status of the meaning-form pairing of the *Ditransitive* construction at different levels of abstraction demonstrates a number of important points: (1) The syntactic frame [NP1, NP2, NP3] occurring with all verbal LUs evoking the Giving frame is the prototypical instantiation of the *Ditransitive* construction. (2) Lower-level semantic frames may use the semantics of the Giving frame, but pairing these semantics with the form side of the *Ditransitive* construction is subject to significant variation. Thus, in some cases such as the Cooking_Creation frame, all verbal LUs pair the used meaning of the Giving frame with a ditransitive syntactic frame. In most cases, however, the description of a semantic frame needs to explicitly list the verbal LUs that are capable of occurring with a ditransitive syntactic frame. (3) As in Table 1 above, we find parallel form-meaning structures at different levels of constructional abstraction. As such, the FEs that occur as CEs as a part of construction can be interpreted as concrete instances of higher-level FEs. This means that the SPEAKER FE of the Telling, Questioning, and Statement frames can be interpreted as a concrete instantiation of the more abstract COMMUNICATOR FE of the Communication frame, which in turn can be interpreted as a more concrete instantiation of the DONOR FE of the Giving frame. (4) Specifying form-meaning pairings this way allows us to systematically account for both abstract constructions such as the *Ditransitive* while also explicitly listing the item-specific instances, thereby implementing one of Goldberg's (2006: 18) principles: "It's constructions all the way down." This approach has the advantage that there is no need for fusing lexical entries with abstract meaningful constructions, thereby avoiding some of the pitfalls of Goldberg's approach outlined in Section 3 above.

5. Conclusions

The discussion of Goldberg's account of the ditransitive construction has shown that it is problematic because it sometimes has difficulties constraining the fusion of constructions with lexical entries, which is in part due to the implied split between syntax and the lexicon. To overcome these issues I first proposed to adopt a more finely-grained frame-semantic approach to the description and analysis of constructional phenomena. Applying insights from FrameNet, I first showed

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that generalizations over specific syntactic frames are possible at different levels of semantic abstraction using a bottom-up approach. Thus, pointing to LUs of a semantic frame that share the same valence patterns (offering the same perspective of a frame) subsequently allows us to make across-the-board generalizations that hold not only between LUs evoking the same frame, but also between LUs belonging to different frames at different levels of abstraction. Supporting data from communication verbs demonstrated that these types of generalizations are not predictable and therefore need to be hand-coded.

Based on these proposals I have then shown that there are parallels between finely-grained lexical entries (so-called mini-constructions) and more abstract levels of representation. Discussing the pairing of the meaning of the FEC [SPEAKER, ADDRESSEE, TOPIC] with the syntactic frame [NP, NP, PP[about]] at different levels of semantic abstraction I showed that there is a slight variation in meaning, depending on the semantic frame and the individual LUs involved. My alternative proposal is different from Goldberg's (1995/2006) analysis in that it does not strictly separate the lexicon and syntax. Instead, the structures and types of mini-constructions found at the lowest level of the constructional inventory re-occur in similar form but with more abstract meanings at higher levels (see also Faber & Mairal 1999). My proposals do not conflict with Goldberg's view about the status of abstract constructions. Rather, my fine-grained analysis of the different meanings associated with LUs is complementary to Goldberg's account and provides the type of detailed information that Goldberg (2009a: 105, fn. 2) acknowledges: "[I]f we compare the contribution of verb and construction to subtle aspects of meaning involving manner or means, the verb would be more predictive than the construction." The account presented in this paper thus combines Goldberg's proposals regarding the status of abstract-schematic constructions with item-specific knowledge regarding the specific LUs that can occur in a specific construction (for similar proposals regarding the resultative construction, see Boas (to appear)).

Finally, I argued that the network of frames can be effectively linked to syntactic information to arrive at higher-level constructional abstractions. Adopting Fillmore's (2008) concept of a constructicon I showed how the syntax and semantics of the ditransitive construction can be effectively used by LUs of different semantic frames. On this view, lower-level semantic frames may use the semantics of the `Giving` frame, but pairing these semantics with the form side of the *`Ditransitive`* construction is subject to significant variation. The FEs that occur as CEs as parts of a construction can thus be interpreted as concrete instances of higher-level FEs. Specifying form-meaning pairings this way allows us to systematically account for both abstract constructions such as the *`Ditransitive`* while also explicitly listing the item-specific instances. This approach has the advantage that there is no need for fusing lexical entries with abstract meaningful constructions, thereby avoiding

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some of the problems that arise due to the separation of syntax and the lexicon in some constructional approaches.

Notes

1. Thanks to Katrin Erk, Charles Fillmore, Mirjam Fried, Francisco Gonzálvez-García, Seizi Iwata, Marc Pierce, Paul Sambre, and two anonymous reviewers for comments on earlier versions of this paper. The usual disclaimers apply. A previous version of this paper was presented at the 2009 Conference of the Linguistic Society of Belgium in Antwerp. I am grateful to the organizers Paul Sambre and Cornelia Wermuth who put on a very stimulating conference.

2. The term Construction is defined by Goldberg (2006: 5) as follows: "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." See Croft (2001: 17–21), Fried & Östman (2004: 18–23), and Goldberg (2010), among others, for other definitions of the term.

3. There are a number of specific semantic constraints preventing verbs from participating in the ditransitive construction, such as (1) volitionality of the agent (1995: 143), (2) constraints on the recipient (has to be animate) (1995: 147), and (3) other metaphors licensing the construction. In addition, there are general constraints limiting the fusion of verbs with constructions, such as the Semantic Coherence Principle and the Correspondence Principle (Goldberg 1995: 50). See Goldberg (1995: 193–197) for a discussion of a number of constraints specific to the resultative construction. Note that for each of the constructions discussed by Goldberg (ditransitive, caused-motion, resultative, and *way*-constructions, among others), different sets of construction-specific constraints apply in order to restrict the application of these constructions.

4. Note that Goldberg's earlier work (1995/2006) also assumes lexical entries like those in (1) to contain frame-semantic information. One of the crucial differences between Goldberg's account and mine is that Goldberg assumes minimal lexical entries in combination with constructional polysemy (1995: 44–48) to account for the various sub-senses found with a verb. However, constructional polysemy has been shown to be problematic because it does not always account for all meaning extensions found with verbs (see Boas (2002: 135), Iwata (2002: 96), Kay (2005: 75), and Nemoto (2005: 133), among others. See also Kilgarriff (1997), Pustejovsky (1995), Ravin & Leacock (2000), Croft & Cruse (2004), and Stock (2009) on the problems involved in distinguishing different senses of a verb. Goldberg's newer work suggests a broader access to frame-semantic information by assuming that "the constraints on the relationships between verb and construction are different from the constraints on possible verb meanings" and by postulating the Conventional Frame Constraint: "For a situation to be labeled by a verb, the situation or experience may by hypothetical or historical and need not be directly experienced, but it is necessary that the situation or experience evoke a cultural unit that is familiar and relevant to those who use the word" (see Goldberg (2010)).

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5. One anonymous reviewer claims that there is no clear empirical basis for lexical units or frame elements. I disagree with this assertion because the process underlying the creation of semantic frames is based on corpus evidence. As described in Atkins et al. (2003), Boas (2005b), and Fillmore & Baker (2010), FrameNet uses textual occurrences of a given target word in the British National Corpus to delineate lexical units. Frames are created in a bottom-up fashion, alternating between introspectively collecting lexical items that evoke a frame, and collecting corpus occurrences to further explore the meaning nuances of the words in question. In contrast to many other lexicographic projects, FrameNet centrally relies on frame elements during the frame creation process, as words are grouped together in a frame only if they share the same core set of frame elements (see Ellsworth et al. (2004) for more information). Another point to consider is the cross-linguistic applicability of semantic frames. FrameNet frames have been successfully used as a basis for FrameNets in a variety of other languages such as German, Spanish, Japanese, French, and Hebrew (see Boas 2009a for an overview). These FrameNets have confirmed frames as concepts that can be used cross-linguistically to describe predicate-argument structures (barring some typological differences) (cf. Ohara 2009, Petruck 2009, and Subirats 2009). I thank Katrin Erk for her suggestions concerning these points.

6. The Statement frame is one of many frames that use the Communication frame. The black arrow pointing away from the Communication frame to the box "40 children total" indicates that there are a total of 40 other frames that inherit the Communication frame.

7. The verb *tell* has various sub-senses, each represented by a lexical unit (LU) evoking a different semantic frame. That is, in addition to the Telling frame, *tell* also evokes the Request frame (A SPEAKER asks an ADDRESSEE for something, or to carry out some action) and the Reporting frame (An INFORMER informs the AUTHORITIES of the illegal or otherwise improper BEHAVIOR of the WRONGDOER), among others. Although only verbs are discussed here, nouns and adjectives also evoke frames.

8. For more information about the different types of valence information contained in FrameNet, see Fillmore (2007).

9. The column "Number Annotated" on the left side in Figure 2 shows how many annotated example sentences are available for each valence pattern. For more information about all relevant FrameNet terminology, see Fillmore & Petruck (2003).

10. For more information on annotation, phrase types, and grammatical functions see Fillmore et al. 2003, Boas 2005b, and Ruppenhofer et al. 2006.

11. It is important to point out that the lexical entries recorded by FrameNet may not represent all valence patterns associated with a given LU. As such, I employ the FrameNet entries only as a basis for comparison without any claim with respect to their exhaustiveness. For additional valency information about these verbs, see also Herbst et al. (2004).

12. Figures 2 and 3 only show partial valence tables for tell and inform, respectively. For the full-length tables, please direct your Internet browser to the FrameNet website at [http://framenet.icsi.berkeley.edu].

13. In Boas (2006, 2008c) I show that there is a correlation between a verb's level of descriptivity (see Snell-Hornby 1983) and the range and number of syntactic patterns with which it occurs. Thus, highly descriptive verbs such as *strut* or *trudge* exhibit a rather limited range of syntactic

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patterns while less descriptive verbs such as *bustle*, *walk*, or *go* exhibit a much wider range of syntactic patterns. On this view, the difference in FECs and the range of syntactic realizations occurring with the LUs in the Statement frame could be explained by different levels of verb descriptivity. Due to space limitations I do not pursue an analysis of communication verbs in terms of verb descriptivity.

14. *Tell* has 35 FECs of this type, *inform* has only 13.

15. Iwata proposes three levels of constructional abstraction from very specific to abstract: individual occurrences, verb-specific constructions, and verb-class specific constructions. Despite these overlaps, there are some significant differences. First, Iwata assumes basic senses such as that of the verb-class-specific construction (Frame Semantics takes a more radical splitting approach). Second, Frame Semantics does not rely on focusing or sanctioning mechanisms to sanction alternating verb behavior (the locative alternation is handled by two separate LUs, one evoking the `Placing` frame, the other the `Filling` frame). Finally, Frame Semantics does not assume any specific inheritance hierarchies that include syntactic information (see Figure 1 above). It focuses on frame-to-frame relations at a semantic level while regarding the syntactic specifications that come with a particular LU as secondary (see also Boas 2009b).

16. The valence patterns found in FrameNet entries list FEs in alphabetical order. To facilitate comparison of valence patterns with actual annotated data I have switched the order of FEs in Table 1 and below to reflect the syntactic order in which they are realized.

17. On the influence of manner components of meaning on syntactic realization, see Boas (2006, 2008c).

18. The ten level-1 frames using or inheriting from the level-2 Statement frame are: `Attributed_information`, `Adducing`, `Unattributed_Information`, `Telling`, `Reveal_Secret`, `Renunciation`, `Recording`, `Complaining`, `Judgment_communication`, and `Chatting`.

19. Strictly speaking, there is no speaker FE in the `Judgment_direct_address` frame, but rather a COMMUNICATOR FE that is very close in meaning to the SPEAKER FE in the telling frame. Following Van Valin (1996), I assume that there is a very minimal semantic contrast between the SPEAKER and COMMUNICATOR FEs, and that at a higher level of abstraction they are categorized as a type of more general AGENT FE.

20. Note that this methodology should not rely exclusively on corpus attestations but should rather be supplemented by linguistic intuitions where appropriate.

21. Goldberg (2006: 227) also acknowledges "both knowledge of instances and generalizations over instances. Far from being an arbitrary collection of stipulated descriptions, our knowledge of linguistic constructions, like our knowledge generally, forms an integrated and motivated network."

References

Atkins, Beryl .T.S., Rundell, Michael and Sato, Hiroaki. 2003. "The contribution of FrameNet to practical lexicography". *International Journal of Lexicography* 16(3), 333–357.

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All rights reserved

Boas, Hans C. 2002. "On Constructional Polysemy and Verbal Polysemy in Construction Grammar". *Proceedings of the 2000 Western Conference on Linguistics* 12, 126–139.
Boas, Hans C. 2003. *A Constructional Approach to Resultatives*. Stanford: CSLI Publications.
Boas, Hans C. 2005a. "Semantic Frames as Interlingual Representations for Multilingual Lexical Databases". *International Journal of Lexicography* 18(4), 445–478.
Boas, Hans C. 2005b. "From Theory to Practice: Frame Semantics and the Design of FrameNet". In S. Langer and D. Schnorbusch (eds), *Semantik im Lexikon*. Tübingen: Narr, 129–160.
Boas, Hans C. 2006. "A frame-semantic approach to identifying syntactically relevant elements of meaning". In P. Steiner, H.C. Boas and S. Schierholz (eds), *Contrastive Studies and Valency. Studies in Honor of Hans Ulrich Boas*. Frankfurt and New York: Peter Lang, 119–149.
Boas, Hans C. 2008a. "Resolving form-meaning discrepancies in Construction Grammar". In J. Leino (ed.), *Constructional Reorganization.* Amsterdam and Philadelphia: John Benjamins, 11–36.
Boas, Hans C. 2008b. "Determining the structure of lexical entries and grammatical constructions in Construction Grammar". *Annual Review of Cognitive Linguistics* 6, 113–144.
Boas, Hans C. 2008c. "Towards a frame-constructional approach of verb classification". *Revista Canaria Estudios Ingleses* 57, 17–48.
Boas, Hans C. 2009a. "Recent trends in multilingual computational lexicography". In H.C. Boas (ed.), *Multilingual FrameNets in Computational Lexicography: Methods and Applications*. Berlin and New York: Mouton de Gruyter, 1–36.
Boas, Hans C. 2009b. "Verb meanings at the crossroads between higher-level and lower-level constructions". *Lingua* 120, 22–34.
Boas, Hans C. To appear. "Zum Abstraktionsgrad von Resultativkonstruktionen". In S. Engelberg, A. Holler and K. Proost (eds), *Sprachliches Wissen zwischen Lexikon und Grammatik*. Berlin and New York: Mouton de Gruyter.
Boas, Hans C. and Sag, Ivan A. (eds) 2010. *Sign-based Construction Grammar*. Stanford: CSLI Publications.
Bybee, Joan 2007. *Frequency of use and the organization of language*. Oxford: Oxford University Press.
Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
Croft, William. 2001. *Radical Construction Grammar*. Oxord: Oxford University Press.
Croft, William. 2003. "Lexical rules vs. constructions: a false dichotomy". In H. Cuyckens, T. Berg, R. Dirven and K.-U. Panther (eds), *Motivation in Language: Studies in honour of Günter Radden*. Amsterdam and Philadelphia: John Benjamins, 49–68.
Croft, William and Cruse, Alan. 2004. *Cognitive Linguistics*. Cambridge: Cambridge University Press.
Cruse, Alan. 1986. *Lexical Semantics*. Cambridge: Cambridge University Press.
Ellsworth, Michael, Erk, Katrin, Kingsbury, Paul and Pado, Sebastian. 2004. "PropBank, SALSA, and FrameNet: How design determines product". *Proceedings of the LREC 2004 Workshop on Building Lexical Resources from Semantically Annotated Corpora*, Lisbon.
Faber, Pamela B. and Mairal Usón, Ricardo. 1999. *Constructing a Lexicon of English Verbs*. Berlin and New York: Mouton de Gruyter.
Fillmore, Charles J. 1977. "Topics in Lexical Semantics". In P. Cole (ed.), *Current Issues in Linguistic Theory*. Bloomington: Indiana University Press, 76–136.
Fillmore, Charles J. 1982. "Frame Semantics". In Linguistic Society of Korea (ed.), *Linguistics in the Morning Calm*. Seoul: Hanshin, pp. 111–138.

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All rights reserved

Fillmore, Charles J. 1985. "Frames and the semantics of understanding". *Quaderni di Semantica* 6(2), 222–254.
Fillmore, Charles J. 1986. "Pragmatically controlled zero anaphora." *BLS* 12, 95–107.
Fillmore, Charles J. 2007. "Valency issues in FrameNet". In T. Herbst and K. Götz-Votteler (eds), *Valency: Theoretical, descriptive, and cognitive issues*. Berlin and New York: Mouton de Gruyter, 129–160.
Fillmore, Charles J. 2008. *Border Conflicts: FrameNet meets Construction Grammar*. Plenary Lecture at EURALEX XIII, Barcelona, Spain.
Fillmore, Charles J. and Atkins, Beryl T.S. 1992. "Towards a frame-based organization of the Lexicon: The semantics of RISK and its neighbours". In A. Lehrer and E. Kittay (eds), *Frames, Fields, and Contrasts: New Essays in Lexical Organization*. Hillsdale: Lawrence Erlbaum Associates, 75–102.
Fillmore, Charles J. and Atkins, Beryl T.S. 2000. "Describing Polysemy: The Case of *Crawl*". In Y. Ravin and C. Laecock (eds), *Polysemy*. Oxford: Oxford University Press, pp. 91–110.
Fillmore, Charles J. and Baker, Collin. 2010. "A frames approach to semantic analysis". In: B. Heine and H. Narrog (eds), *The Oxford Handbook of Linguistic Analysis*. Oxford: Oxford University Press, 313–340.
Fillmore, Charles J., Johnson, Christopher R. and Petruck, Miriam R.L. 2003. "Background to FrameNet". *International Journal of Lexicography* 16(3), 235–250.
Fillmore, Charles J., and Petruck, Miriam. 2003. "FrameNet Glossary." *International Journal of Lexicography* 16(3), 359–361.
Fried, Mirjam and Östman, Jan-Ola. 2004. „Construction Grammar. A thumbnail sketch". In M. Fried and J.-O. Östman (eds), *Construction Grammar in a Cross-Language Perspective*. Amsterdam and Philadelphia: John Benjamins, 11–86.
Goldberg, Adele. 1995. *Constructions: A Construction Grammar approach to argument structure*. Chicago: University of Chicago Press.
Goldberg, Adele. 1999. "Construction Grammar". In K. Brown and J. Miller (eds), *Concise Encyclopedia of Grammatical Categories*. Amsterdam: Elsevier.
Goldberg, Adele. 2005. "Constructions, lexical semantics and the correspondence principle: Accounting for generalizations and subregularities in the realization of arguments". In N. Erteschik-Shir and T. Rapoport (eds), *The syntax of aspect*. Oxford: Oxford University Press, 215–236.
Goldberg, Adele. 2006. *Constructions at Work*. Oxford: Oxford University Press.
Goldberg, Adele. 2009a. "The nature of generalizations in language". *Cognitive Linguistics* 20(1), 93–127.
Goldberg, Adele. 2009b. "Constructions Work". *Cognitive Linguistics* 20(1), 201–224.
Goldberg, Adele. 2010. "Verbs, constructions, and semantic frames". In M. Rappaport Hovav, E. Doron, and I. Sichel (eds), *Syntax, Lexical Semantics, and Event Structure*. Oxford: Oxford University Press.
Goldberg, Adele and Jackendoff, Ray. 2004. "The English resultative as a family of constructions". *Language* 80(3), 532–568.
Gonzálvez-García, Francisco. 2008. "Cognitive Construction Grammar works. An interview with Adele E. Goldberg". *Annual Review of Cognitive Linguistics* 6, 345–360.
Gross, Maurice. 1994. "Constructing Lexicon Grammars". In B.T.S. Atkins and A. Zampolli (eds), *Computational Approaches to the Lexicon*. Oxford: Oxford University Press, 213–258.

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All rights reserved

Herbst, Thomas, Heath, David, Roe, Ian F. and Götz, Dieter. 2004. *A valency dictionary of English*. Berlin and New York: Mouton de Gruyter.

Hunston, Susan, and Francis, Gil. 2000. *Pattern Grammar. A Corpus-driven Approach to the Lexical Grammar of English*. Amsterdam and Philadelphia: John Benjamins.

Iwata, Seizi. 2002. "Does MANNER count or not? Manner-of-motion verbs revisited". *Linguistics 40*(1), 61–110.

Iwata, Seizi. 2004. "Over-prefixation: A lexical constructional approach". *English Language and Linguistics* 8, 239–292.

Iwata, Seizi. 2008. *Locative Alternation. A lexical-constructional approach*. Amsterdam and Philadelphia: John Benjamins.

Kay, Paul. 1996. *Argument Structure: Causative ABC-Constructions*. Manuscript. University of California at Berkeley.

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*. Amsterdam and Philadelphia: John Benjamins, 71–100.

Kilgarriff, Adam. 1997. "I don't believe in word senses". *Computers and the Humanities* 31(2), 91–113.

Langacker, Ronald. 2000. "A dynamic usage-based model". In S. Kemmer and M. Barlow (eds), *Usage-based models of language*. Stanford: CSLI Publications, 1–63.

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

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

Nemoto, Noriko. 2005. "Verbal polysemy and Frame Semantics in Construction Grammar: some observations about the locative alternation". In M. Fried and H.C. Boas (eds), *Grammatical Constructions. Back to the Roots*. Amsterdam and Philadelphia: John Benjamins, 119–138.

Ohara, Kyoko H. 2009. "Frame-based contrastive lexical semantics in Japanese FrameNet: The case of *risk* and *kakeru*". In H.C. Boas (ed.), *Multilingual FrameNets in Computational Lexicography: Methods and Applications*. Berlin and New York: Mouton de Gruyter, 163–182.

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

Petruck, Miriam. 2009. "Typological considerations in constructing a Hebrew FrameNet". In H.C. Boas (ed.), *Multilingual FrameNets in Computational Lexicography: Methods and Applications*. Berlin and New York: Mouton de Gruyter, 183–208.

Petruck, Miriam, Fillmore, Charles J., Baker, Collin. Ellsworth, Miriam. and Ruppenhofer, Josef. 2004. "Reframing FrameNet Data". *Proceedings of the 11th EURALEX International Congress*, Lorient, France, 405–416.

Pinker, Steven. 1989. *Learnability and Cognition*. Cambridge (Mass.): MIT Press.

Pustejovsky, James. 1995. *The Generative Lexicon*. Cambridge (Mass.): MIT Press.

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

Ravin, Yael and Leacock, Claudia. (eds). 2000. *Polysemy*. Oxford: Oxford University Press.

Reddy, Michael. 1979. "The conduit metaphor". In A. Ortony (ed.), *Metaphor and Thought*. Cambridge: Cambridge University Press, 284–324.

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All rights reserved

Ruiz de Mendoza, Francisco. and Mairal-Usón, Ricardo. 2008. "Levels of description and constraining factors in meaning construction: an introduction to the Lexical Constructional Model". *Folia Linguistica* 42(2), 355–400.

Ruppenhofer, Josef, Ellsworth, Michael, Petruck, Miriam, Johnson, Christopher and Scheffczyk, Jan. 2006. *FrameNet II: Extended Theory and Practice.* <http://framenet.icsi.berkeley.edu>.

Ruppenhofer, Josef and Michaelis, Laura. To appear. "A constructional account of genre-based argument omissions". *Constructions and Frames*.

Snell-Hornby, Mary. 1983. *Verb descriptivity in English and German*. Heidelberg: Winter.

Stock, Penny. 2009. "Polysemy". In T. Fontenelle (ed.), *Practical lexicography: A reader*. Oxford: Oxford University Press, 153–160.

Subirats, Carlos. 2009. "Spanish FrameNet: A frame-semantic analysis of the Spanish lexicon". In H.C. Boas (ed.), *Multilingual FrameNets in Computational Lexicography: Methods and Applications*. Berlin and New York: Mouton de Gruyter, 135–162.

Subirats, Carlos and Petruck, Miriam. 2003. "Surprise: Spanish FrameNet!" In E. Hajicova, A. Kotescovoca, and J. Mirovsky (eds), *Proceedings of CIL 17*. CD-ROM, Prague: Matfyzpress.

Van der Leek, Frederike. 1996. "Rigid syntax and flexible meaning: The case of the English ditransitive". In A. Goldberg (ed.), *Conceptual structure, discourse and language*. Stanford: CSLI Publications, 321–332.

Van der Leek, Frederike. 2000. "Caused-motion and the 'bottom-up' role of grammar". In A. Foolen and F. van der Leek (eds), *Constructions in cognitive linguistics*. Amsterdam and Philadelphia: John Benjamins, 301–331.

Van Valin, Robert. 1996. "The case for 'effector': case roles, agents, and agency revisited". In M. Shibatani and S. Thompson (eds), *Grammatical Constructions: Their form and meaning*. Oxford: Oxford University Press, 289–322.

Welke, Klaus. 2009. "Konstruktionsvererbung, Valenzvererbung und die Reichweite von Konstruktionen". *Zeitschrift für Germanistische Linguistik* 37, 514–543.

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