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Constructionist approaches

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1. Introduction

Most of the approaches represented in this volume share important underlying assumptions that position the entirety of these approaches at a far remove from mainstream generative grammar. It is not clear that the differences in approach and emphasis by different researchers rise to the level of mandating distinct frameworks, so this paper will emphasize what they have in common (cf. also Trousdale and Hoffmann, this volume). The major tenets that are shared by constructionist approaches, distinguishing them from mainstream generative grammar, include the following:

1. **Grammatical constructions:** phrasal constructions, like traditional lexical items, are learned pairings of form and function (Birner & Ward 1998; Fillmore et al. 1988; Goldberg 1995; 2006; Lakoff 1987; Wierzbicka 1988).
2. **Surface structure:** Grammar does not involve any transformational or derivational component. Semantics is associated directly with surface form (Culicover & Jackendoff 2005; Goldberg 2002).
3. **A network of constructions:** Phrasal constructions, words, and partially filled words (aka morphemes) are related in a network in which nodes are related by inheritance links (Booij 2010; Fillmore et al. 1988; Goldberg 1995; Hudson 1990; Hudson 2007; Lakoff 1987; Langacker 1987; Wierzbicka 1988) .
4. **Cross-linguistic variability and generalization:** Languages are acknowledged to vary in wide-ranging ways. The cross-linguistic generalizations that do exist are

explained by domain-general cognitive processes or by the functions of the constructions involved (Boas 2010; Croft 2001; Evans & Levinson 2009; Haspelmath 2008).

A final tenet is included even though it is not shared equally by all constructionist approaches, because it allows for constructionist approaches to interface naturally with theories of acquisition, language processing, and language change:

5. **Usage-based:** Knowledge of language includes both items and generalizations, at varying levels of specificity. (Barlow & Kemmer 2000; Bybee & Eddington 2006; Goldberg 2006; Langacker 1988b; Lieven et al. 2003; Tomasello 2003).

It is not a logical necessity that *all* of these tenets be adopted, and not all researchers emphasize each one equally (González-García & Butler 2006). However, the tenets do cohere in important ways. Each of these five principles is discussed below in sections 2-6.

Most constructionist approaches have been heavily influenced by several additional tenets traditionally associated with Cognitive Linguistics. I leave these aside for present purposes (but cf. Goldberg 1996; Goldberg forthcoming; and references cited therein for discussion).

- a. Semantics is based on speakers' *construals* of situations, not on objective truth conditions (Fauconnier 1985; Goldberg 1995; Jackendoff 1983; Lakoff 1987; Langacker 1987; Langacker 1988a; Michaelis 2004; Talmy 1976).
- b. Semantics, information structure, and pragmatics are interrelated; all play a role in linguistic function. Such functions are part of our overall conceptual system and not a separate modular component (Fillmore 1985; Goldberg 1995; ; Leino, this volume; Haiman 1980; Lakoff 1987; Lambrecht 1994; Langacker 1987; Talmy. 1988).

- c. Categorization does not involve necessary and sufficient conditions, but rather generalizations over exemplars, typically including prototypical exemplars and conventionalized extensions (Abbot-Smith & Tomasello 2006; Ackerman 1996; Brugman 1988; Fillmore 1977; Haiman 1985; Heine 1992; Lakoff 1987; Rosch 1973; Rosch & Mervis 1975; Ross & Makin 1999; Talmy 2000).
- d. The primary function of language is to convey information. Thus formal distinctions are useful to the extent that they convey semantic or pragmatic (including information theoretic) distinctions. (Ackerman 1996; Bolinger 1977; Croft 1991; Haiman 1985; Lakoff 1987; Langacker 1987; Wierzbicka 1988).
- e. The role of social cognition and bodily experience are viewed as essential to accounts of learning and meaning (Bergen et al. 2007; Croft 2009; Fillmore 1977; Lakoff & Johnson 1980; Matlock 2004; Tomasello 2008).

2. GRAMMATICAL CONSTRUCTIONS.

Constructions are defined to be conventional, learned form-function pairings at varying levels of complexity and abstraction (Goldberg 1995; 2006). This definition is meant to highlight the commonality between words and larger phrasal units. Various types of constructions are provided in Table 1.

Word	e.g., <i>Iran, another, banana</i>
Word (partially filled)	e.g., <i>pre-N, V-ing</i>
Idiom (filled)	e.g., <i>Going great guns, give the Devil his due</i>
Idiom (partially filled)	e.g., <i>Jog <someone's> memory, <someone's> for the asking</i>
Idiom (minimally filled)	e.g., <i>The more you think about it, the less</i>
The Xer the Yer	<i>you understand</i>

(unfilled)	e.g., <i>He gave her a fish taco;</i>
Ditransitive construction: Subj V Obj1 Obj2	<i>He baked her a muffin.</i>
Passive: Subj aux VPpp (PPby)	e.g., <i>The armadillo was hit by a car</i>

Table 1: Constructions at varying levels of complexity and abstraction

Not every researcher who adopts a constructionist perspective explicitly uses the term. Nor does everyone apply the term *construction* to the word or morphemic level, although since Saussure (1916), linguists have been comfortable acknowledging that roots (or lemmas) and affixes are conventional pairings of form and function. By acknowledging that morphemes are emergent generalizations over existing words in the form of partially filled templates, the perspective is brought in line with the growing consensus among morphologists (Ackerman, 2004; Blevins, 2001; Aronoff, 1983; Booij, 2010). }

Descriptive adequacy ensures that subtle facts about semantics and use of particular constructions need to be accounted for. Moreover, constructionists aim to account for all aspects of grammar, including not only “core” aspects of grammar, but also low-frequency or unusual constructions that other theories might relegate to the “periphery” or “residue.” In this spirit, we aim to fully account for subregularities as well as the most general patterns (Culicover 1999; Fillmore et al. 1988; Lakoff 1970).

As an example of a subregularity, consider the [P N] construction that involves the combination of a preposition and a bare count noun as in the examples below:

1. She was in prison.
2. She came from school.
3. She left for work.
4. They are on vacation.
5. He was in hospital. (British English)

Normally (non-generic, common) count nouns require determiners, so the form of this construction is clearly unusual. Moreover, no modification of the bare noun is allowed:

6. *She went to big bed. (Cf. She went to the big bed).

The construction also requires a special interpretation. One does not go *to prison* as a warden, but only as a prisoner. People are likewise not *in school* as custodial staff as they might be if they were *in the school*. The construction conveys that a stereotypical activity or role associated with the nominal referent is involved.

The [P N] pattern is clearly not fully productive. For example, American English speakers do not go *to hospital* or *on holiday* although British English speakers do. And neither group can go **to bath*, **to computer*, **to office*, **to kitchen*, or **to airport* even though there exist stereotypical roles or activities associated with these places.

Constructions that show limited generalization are not hard to come by. There are thousands of collocations, prefabricated utterances (“prefabs”), idioms and minor constructions that buck the trends of a language in unexpected ways (Culicover 1999; Goldberg 2006; Jackendoff 2002; Lakoff 1970; Pawley & Snyder 1983; Wray 2002). These can often be related to more general constructions, just as the [P N] construction is a special instance of the more general prepositional phrase ([P NP]) construction. By relating constructions to one another in a default inheritance hierarchy, we can capture both the regular and the irregular aspects of each construction (see section 4; see also Kay this volume for a quite different perspective).

Much of our knowledge of language is quite general, and this knowledge is captured within the network of constructions as well. For example, argument structure constructions (Goldberg 1995) are the form-function pairings that constitute the basic “linking” patterns of simple clauses (e.g., Bresnan & Kanerva, 1989; Dowty, 1991; Grimshaw, 1990; Gleitman 1994; Jackendoff, 1983; Pinker 1989; or “lexical templates” overlain on specific verbs (Rappaport Hovav & Levin, 1998). Constructional terminology is adopted here, because the phrasal form-meaning correspondences have been argued to exist independently of particular verbs (Goldberg, 1989, 1995; Jackendoff, 2002).

As an example of an argument structure construction, consider the ditransitive construction, which in active form has two postverbal NPs as in (7):

7. She gave him a book. (ditransitive construction)

This construction is reliably associated with the meaning of “transfer” (Goldberg 1992; Goldberg et al. 2005; Green 1974; Hovav & Levin 2005; Oehrle 1975; Pinker 1989). Evidence of the association between the form and meaning comes from the interpretation of nonsense verbs. When people are asked what the nonsense verb *moop* means in (8), a full 60% of them respond with “give,” and the rest offer meanings that preserve the meaning of literal or metaphorical transfer (e.g., “tell”) (Ahrens 1995):

8. She mooped him something.

Kaschak and Glenberg (2000) have demonstrated experimentally that subjects rely on constructional meaning when they encounter nouns used as verbs in novel ways (e.g., *to crutch*). In particular, they showed that different constructions differentially influence the interpretations of the novel verbs. For example, *She crutched him the ball* (ditransitive) is interpreted to mean that she used the crutch to transfer the ball to him, perhaps using it as one would a hockey stick. On the other hand, *She crutched him* (transitive) is more likely to mean that she hit him over the head with the crutch. Kaschak and Glenberg suggest that the constructional pattern specifies a general scene and that the “affordances” of particular objects are used to specify the scene in detail (cf. Pustejovsky's 1995: qualia structures). It cannot be the semantics of the verb that determines the interpretation in isolation, because the word form (*crutch*) is not represented in the lexicon as a verb but as a noun (cf. also Goldwater & Markman 2009).

Jackendoff (this volume) takes issue with the idea that constructions generally relate form to function, arguing instead that there are many purely syntactic (and purely semantic) generalizations. But the apparent disagreement may be more terminological than contentful, in that Jackendoff seems to assume that functions are necessarily quite

concrete. In fact, the function of abstract formal templates is often quite abstract. For example, the verb phrase construction that Jackendoff suggests is meaningless does have a function, namely, predication. The transitive construction is likewise associated with two-argument propositional semantics (Fisher et al. 1994; Gleitman 1994). Since it is function that is important, not propositional semantics, even the “meaningless” phrase *fa la la* does have a function as an emotive part of a particular Christmas carol.

It is *possible* for a construction to be ambiguous: the same form being paired with unrelated functions, just like ambiguous words. However, as is true of words, ambiguity is relatively rare compared with polysemy. Moreover, if a single phrasal pattern were truly associated with unrelated functions, such as the functions of conjunction and passivization, or reflexivization and modification, then their distributional behavior is not likely to be identical. When behavior diverges, we generally decide that the syntax involved is not the same. This is perhaps why purely syntactic generalizations are so hard to find. What is typical is neither ambiguity nor functional identity, but rather polysemy: the same form often has different but *related* functions (Goldberg 1992; Lakoff 1987; Taylor 1995).

3.SURFACE GENERALIZATIONS

Since the earliest days of generative grammar, there has existed a strong tendency to focus on alternations, considering one argument structure construction in relation to another specific rough paraphrase (Lakoff 1970; Levin 1993). Initially this was a result of the emphasis on transformations that derived one pattern from another. While today there exist many non-derivational theories for which this motivation no longer exists, the traditional outlook has not completely lost its grip, as can be seen from continuing focus on partial or incomplete generalizations such as the “dative” alternation or the “locative” alternation. Yet it is profitable to look beyond alternations and to consider each argument structure construction on its own terms. For example, although only (9a) can be paraphrased by a ditransitive expression (given in parentheses), it patterns together with (9b, c, d) both syntactically and semantically; the examples in (9) all involve subjects, objects and oblique path phrases, and they all express caused-motion. As Baker notes, “it seems artificial to say that the PP in [examples like 9a] is not a locational path as well”

(Baker 1997; cf. also Marantz 1997). The caused-motion construction captures the generalization across all of the examples in 9(a-d) (Goldberg 1995; Pinker 1989):

- 9.a. Mina sent a book to Mel. (\approx Mina sent Mel a book.)
 - b. Mina sent a book to Chicago.
 - c. Mina sent a book toward the front of the room.
 - d. Mina sent a book through the metal detector.

Recognizing the caused-motion construction allows us to account for the fact that a verb such as *cough*, that does not lexically entail caused-motion, can convey caused-motion when it appears in this construction:

10. “I actually had a moth go up my nose once. I...coughed him out of my mouth”
(bikeforums.net/archive/index.php/t-292132)

Thus we can identify a more general correspondence between form and meaning that is not naturally captured at the level of the individual verb: the caused-motion construction.

When faced with pairs of sentences that share words and involve different argument structure patterns, similarities are most naturally attributed to the words, and differences to the argument structure patterns. Paraphrase relationships are captured by explicit reference to the words, particularly relational words such as verbs.

The ditransitive construction (as in (7)-(8)) also provides a very broad generalization if we attend to surface structure instead of to possible alternations. Although many linguists continue to treat (regular) ditransitives and “benefactive” ditransitives (such as *Mina baked Mel a cake*) as distinct constructions because of their different paraphrases (*Mina sent a book **to** Mel/Mina baked a cake **for** Mel*), both types of ditransitive examples pattern alike both semantically and syntactically (Goldberg 2006: 26-33).

4 A Network of Constructions

Importantly, the constructions of a given language do not form an unstructured set. Relationships between and among constructions are captured via a **default inheritance network**. For example the [P N] construction (e.g., *to bed*) inherits its word order from the more general, abstract Prepositional Phrase construction as in Figure 1. It differs from the general PP construction in specifying an N instead of an NP daughter. The PP construction captures the fact that English has prepositions instead of postpositions; since the word order of the construction is fixed, its phrase structure is specified. Degree of *entrenchment* (roughly, frequency) is captured via degree of boldface (following the notation of Langacker 1987); clearly the general PP construction is more entrenched than the [P N] construction.

[INSERT FIGURE 1 HERE: SEE SEPARATE PDF FILE]

Figure 1. Example of default (usage-based) inheritance hierarchy that relates instances of the PN construction to the more general prepositional phrase (PP) construction.

Not all constructions specify word order. For example, argument structure constructions do not, and thus they do not directly determine phrase structure trees. Instead, word order is determined by combining argument structure constructions with constructions such as the VP construction, subject-predicate construction, and/or a long-distance dependency construction.

Let us consider the resultative construction, as in (11) and (12) and the sort of facts about it that a hierarchy is naturally able to capture. The resultative construction involves a secondary predication and designates a change of state (Boas 2003 ; Boas 2000; Goldberg & Jackendoff 2004; Iwata 2006; Rappaport Hovav & Levin 2001; Simpson 1983; Wechsler 1997). The intransitive and transitive versions of the resultative construction are related by a “subpart” inheritance link (Goldberg 1995):

- | | |
|------------------------------|--------------------------|
| 11. The nut broke apart. | Intransitive resultative |
| 12. She broke the nut apart. | Transitive resultative |

Relating the English (transitive) resultative construction exemplified in (13) to the caused-motion construction (e.g., 14) by a metaphorical relationship link allows us to capture certain distributional properties of the former.

- | | |
|-----------------------------------|---------------|
| 13. She drove him to distraction. | Resultative |
| 14. She drove him to Detroit. | Caused-Motion |

In particular, the resultative phrase behaves like a literal path phrase insofar as it a) cannot occur with ditransitives (15,16) and b) cannot be combined to create a discontinuous “path” (17) (see the “Unique Path Constraint” of Goldberg 1991, 1995; Matsumoto 2007):

- 15. *She kicked him the ball black and blue.
- 16. *She kicked him the ball into the window.

- 17. *She kicked him black and blue down the stairs.

The default inheritance hierarchy that includes both word and phrasal patterns is well suited for capturing tricky cases that have bedeviled traditional theories, for example, complex predicates that are in some ways word-like and in other ways phrasal. Goldberg (2002) offers an account of the Persian complex predicate (CP) construction that treats the CP as a word *by default*. That is, a CP_{vo} construction has the external syntax of a V₀, which accounts for a wide range of properties strongly associated with zero level status, including the formation of nominalizations, the resistance to separation, certain stress facts and frequent non-compositional verb-like semantics.

At the same time the grammar also has more specific constructions that serve to override the specifications of the general construction. In particular, the future auxiliary, fully inflected, necessarily intervenes between host and light verb; the direct object clitic also may intervene between host and light verb. These facts are independently motivated, by general word order and stress facts of Persian and the diachronic history of the CP as a complement + verb. A diagram of all the relevant necessary constructions, whether CP-

specific or not, and their interactions is given in Figure 2. “<” indicates linear precedence. Stress is indicated by an “/” accent.

Three constructions are required to account for the future auxiliary generally (A), complex predicates generally (B), and clitics generally (C). The daughter two constructions (D and E) only serve to specify conflicts between their mother constructions. Since default inheritance is used, conflicts are allowed. But the daughter node must explicitly resolve them.

[INSERT FIGURE 2 HERE: SEE SEPARATE PDF FILE]

Figure 2: A summary of the constructions critical for accounting for Persian CPs and their zero-level *and* phrasal properties (see Goldberg 2002).

5. Cross-linguistic variability and generalization

Constructions typically do not exist *sui generis*; i.e., they are generally not fully arbitrary. Relationships between form and meaning are typically motivated, and thus we find recurrent patterns cross-linguistically. But because constructionist approaches do not rely on innate universal principles, constructions are expected to vary in their specifics cross-linguistically, and this does seem to be the case (Boas 2010; Croft 2001; Evans & Levinson 2009; Haspelmath 2008). What may be called a passive in one language may differ from a passive construction in another language in a number of subtle ways including the presence or choice of auxiliary, the presence or choice of adposition or case that marks the agent argument, possible semantic or discourse restrictions and overall frequency in the language. Finding two constructions in two different languages that are absolutely identical in form, function, and distribution is a rare occurrence outside of cases of shared diachronic history or language contact.

Croft (2001), for example, notes that words that translate into English as nouns, adjectives and adverbs, as well as verbs, are inflected for person, aspect and mood in Makah, an American Indian language, and that no words are inflected for these categories in Vietnamese. He points out that therefore tense-aspect-mood inflection cannot be taken as critical for determining the category of V cross-linguistically (unless of course one is willing to say that all words are verbs in Makah, and no words are verbs in Vietnamese). Croft goes on to point out that no syntactic test will pick out all and only entities that one might wish to call verbs, nouns, adjectives, subjects, or objects across all languages. Moreover, he observes, that even within a single language, a given criterion often only applies within certain larger constructions. For example,

“If one takes passivizability as the criterion for Direct Object in English, then one’s conclusions will tell us something about the Passive, not about some allegedly global category Direct Object... (C)onstructions, not categories or relations, are the basic, primitive units of syntactic representation.” (Croft 2001: p. 46).

This is not to say that there are no strong universal tendencies or implicational universals to be found across languages. Constructionists argue that such cross-linguistic generalizations are better explained via grammar-external explanations such as universal functional pressures, iconic principles, and processing and learning constraints. Let us consider a few examples in order to illustrate the point.

There is a strong universal tendency for languages to have some sort of construction we might refer to as a “passive.” These passive constructions are identified by their related functions: they are constructions in which the topic and/or agentive argument is essentially “demoted,” appearing optionally or not at all. The fact that topics and agents are typically expressed in syntactically prominent slots is motivated by their functions. The fact that special passive constructions exist that allow them to be expressed in non-prominent slots allows speakers a degree of flexibility and is therefore also motivated.

Another cross-linguistic tendency is the so-called “head-direction” parameter. Languages in which verbs appear at the end of sentences have been shown to generally have postpositions and postnominal modifiers while languages with verbs appearing before their non-subject complements tend to have prepositions and pronominal modifiers. This is shown in (18) below:

18. Head Initial Languages: VP[V...] PP[P...]
Head Final Languages: VP[...V] PP[...P]

This “head-direction parameter” has long been used as an example of a purely syntactic generalization that requires an innate universal stipulation. Children would then only have to determine where in the sentence the verbs in their language appear and could then deduce from that where to expect all other types of heads.

However, as is well known, this generalization is not without exceptions. Persian, for example, is a verb-final language, but has prepositions instead of postpositions. In addition, since children must still learn the forms and meanings of the words in their language, including verbs, adpositions, and nouns. The ordering of elements in the

sentence is apparent during this learning, which calls into question the conceptual necessity of any innate generalization.

Still, the strong cross-linguistic tendency is likely not accidental. Diachronic processes may well provide a better account for the relationship between verbs and adpositions, since adpositions often develop from verbs (Nichols 1986). It has also been hypothesized that the tendency for heads to systematically either precede or follow their complements lends a processing advantage (2004; Hawkins 1994). Reali and Christiansen (2005) have supported this idea by demonstrating that simple-recurrent networks found consistent head-complement orderings easier to learn than mixed systems; i.e., given the chance to adapt to their “learners,” the languages in their simulation, over time, came to have a consistent head-complement order similar to that found in real-world languages.

Other generalizations that have been argued to require recourse to innate principles have also found better explanations elsewhere. Lidz et al. (2003) proposed that children come hard-wired with specific knowledge that the number of overtly expressed complements should match the number of semantic participants. We can agree that learners pay attention to the number of referring expressions in a clause as an indicator of the propositional meaning. However, the tendency for the number of nouns to reflect the number of semantic participants finds a natural explanation from the domain of Gricean pragmatics. Any referring expression should be assumed to be relevant to the topic at hand, and any argument that is relevant and non-recoverable from discourse needs to be indicated in some way (Goldberg 2004). Beyond this pragmatic generalization, no syntactic stipulation is needed. The pragmatic generalizations say nothing about arguments that are irrelevant or recoverable; this is an advantage, since languages and constructions within a given language treat recoverable and irrelevant arguments differently. For example, many of the world’s languages, e.g., Chinese and Korean, readily allow recoverable arguments to be omitted; and even English allows patient arguments that are particularly deemphasized in the discourse vis a vis the verb to be omitted (Goldberg 2000).

The often cited linking generalizations of e.g., Dowty (1991) can be summed up as follows: in simple active clauses, *if* there is a subject and an object, and *if* there is an

agent and a patient, then the agent role will be expressed by the subject and the undergoer role as direct object. This is a modest proposal that has been taken by some to express an innate linguistic universal. In fact, the facts are even more modest: there are syntactically ergative languages in which agents are not generally expressed as subjects, there are many languages that do not have canonical subjects, and there are many constructions within a given language that violate the generalizations (e.g., passives which express the agent argument as an oblique). But again, there is something to the generalization. The facts can be restated as follows: semantic actors and undergoers tend to be expressed in formally prominent slots. Prominent syntactic positions can be defined as those positions that license agreement and/or lack overt case and/or may be obligatory. Once stated this way, the generalization is much less mysterious: actor and undergoer arguments are generally expressed in prominent slots cross-linguistically because human beings' attention is naturally drawn to the actors and undergoers in events (Goldberg 2006).

Other generalizations about how form and meaning tend to be linked across languages can be explained by appeal to iconic and analogical processes (Givón 1991; Haiman 1985) and to pragmatic generalizations (Levinson 1983). Constraints on long-distance dependency constructions (traditional 'island constraints') appear to yield to processing explanations that take into account the function of the constructions involved (Ambridge & Goldberg 2008; Deane 1991; Erteschik-Shir 1998; Kluender 1998; Kuno 2001; Van Valin 1998).

This shift of perspective from seeking explanations in terms of syntactic, innate stipulations to trying to account for generalizations by appealing to independently motivated general cognitive mechanisms has been echoed to some extent within mainstream generative grammar as well. For example, the fact that all languages appear to have noun and verb categories may be explained by the existence of corresponding basic semantic categories (Baker 2004). In a recent paper, Chomsky goes so far as to suggest that the only language-specific innate ability that is absolutely required is recursion, and the point is raised that even recursion might turn out not to be specific to language (Hauser et al. 2002). In fact, the claim that recursion is domain-specific is already hotly contested (Jackendoff & Pinker 2005).

Language arises from the human conceptual system. Constraints on languages arise from boundary conditions imposed by constraints on memory, attentional biases, and pragmatic requirements about the content that humans care about conveying.

6. Usage-based model (cf. also Bybee, this volume)

Speakers are at once impressively creative and impressively repetitive. The creative aspect of language allows speakers to express new ideas in new contexts; this aspect of language has been emphasized within much of theoretical linguistics for over 50 years.

Newer research has emphasized the extent to which speech consists of formulaic or prefabricated phrases (“prefabs”) (Pawley & Snyder 1983; Wray 2002). The formulaic aspect presumably simplifies the speakers’ task, in that many utterances or parts of utterances can be pulled directly off the mental shelf without having to build every utterance anew, from scratch. In one study of a two year old child’s spontaneous speech, 63% of the child’s utterances were found to be verbatim repetitions of the child’s own earlier utterances (Lieven et al. 2003). It turns out that children are also faster and more accurate at repeating utterances that occur with high frequency in children’s corpora when lexical frequency and length are controlled for (Bannard & Matthews 2008); the same is true for adults (Bod 1998). This would seem to require that something about high frequency utterances or the way they have been put together is retained in memory in some form.

Oftentimes utterances are at once novel *and* formulaic in that they involve constructions that dictate much of the lexical content, while filling open slots of the construction with new lexical content. For example, even in young children’s speech, nouns are freely substituted for one another from very early on (Tomasello et al. 1997). Open slots of various types exist in all phrasal constructions that are not completely fixed idioms. Possessive phrases are often not fixed in advanced: one can *jog his memory/her memory/their memory/the dog’s memory*. Verb tense and aspect is also often flexible as well: one can *commit* a phone number to memory or have *committed* it to memory. One can take a *stroll* or a *trip down memory lane* (but cannot *?visit memory lane*). These idioms can be represented as in (1)-(3), where the verbal lexeme is represented by capital letters to indicate that tense and aspect are not specified.

19. JOG <someone's> *memory*
20. COMMIT < something> *to memory*
21. TAKE <a trip> *down memory lane.*

Clearly both aspects of language, its creative and its formulaic character, are important to understanding our great facility with language. Largely due to a recognition of this, there has been a growing convergence on “usage-based” models of language. These models are based on the idea that knowledge of language consists of a network of form-function correspondences at varying levels of specificity. Particular languages are learned by generalizing over utterances that a learner has heard used, while language production and comprehension involve combining or decomposing an utterance into its more basic form-function correspondences (Abbot-Smith et al. 2007; Alishahi & Stevenson 2008; Barlow & Kemmer 2000; Bybee 2010; Bybee 1985; 2004; Goldberg 2006; Langacker 1988b; Lieven et al. 2003; Tomasello 2003; Verhagen 2002).

Just how specific is speakers’ knowledge of language? Memory for any experience is necessarily partially abstract insofar as the experience is not recorded completely. We might remember seeing a kumquat but we have abstracted away from the color of the kitchen table upon which it sat; we also may have not noticed the tiny scratch in its surface or the exact length of its stem. So our mental representation of an experience, no matter how vivid, is partially abstracted from the actual experience. The same must be true for any memory of language. Moreover, memory decays over time, leading to additional abstraction.

Instances of phrasal idioms that are clearly retained in long-term memory include those in Table 2.

You've got to be kidding!

Double whammy

wear out <one's> welcome

Eat, drink and be merry

What's up?

Excuse <poss> French

What for?

Face the music

shoot the breeze	sooner or later
Are you all right?	What did you say?
Tell me what happened.	Can I come in?
I'm sorry to hear that.	Need any help?
It just goes to show	I see what you mean.
	Blithering idiot

Table 2: Examples of phrases that are likely stored as part of our knowledge of language, whether or not their interpretations are compositional.

There is a great deal of evidence demonstrating that we retain an impressive amount of item-specific knowledge including relative frequencies of usage (Bannard & Matthews 2008; Bod 1998), and we *also* categorize or generalize the input we hear into patterns based on form and function (e.g., Barlow & Kemmer 2000; Boyd & Goldberg to appear; Goldberg 2006; Langacker 1988b; Tomasello 2003). In fact there is some recent evidence that we retain non-trivial amounts of verbatim language even after a single exposure. Gurevich, Johnson and Goldberg (2010) demonstrated that participants reliably recognize and recall full sentences that they are exposed to only once at above chance rates (Experiments 1 and 3). This finding was of interest because the texts were fairly long (300 words), the context was non-interactive, and no advanced warning of a memory test was given. Verbatim memory was demonstrated even when lexical content and memory for gist were controlled for (Experiments 2 and 4). The most striking finding was one of incidental recall: even after a six-day delay, participants reliably recalled sentences they had heard before when asked to describe scenes, even though they were not asked to reproduce what they had heard (Experiment 5).

7. Creativity

Creativity stems from generalizing instances to form more abstract constructions with open slots. The open slots of a construction allow constructions to combine. When a construction of type Y contains a slot of the same type Y, the construction is recursive.

Several factors that are known to be related to induction more generally, determine how productive a construction is. These include type frequency, variability of

attested instances, similarity and statistical preemption (Barðdal 2008; Boyd & Goldberg to appear; Suttle & Goldberg to appear). Thus productivity depends on how the witnessed instances are distributed and how related the potential coinage is to those instances (and whether there exists a prepackaged alternative that statistically preempts it).

An actual expression typically includes the combination of at least half a dozen different constructions. For example, the expression in (16) involves the list of constructions given in (17a-g).

22. *What did Mina buy Mel?*
23. a. Ditransitive construction
- b. Non-subject question construction
- c. Subject-Auxiliary inversion
- d. VP construction
- e. NP construction
- f. Indefinite determiner construction
- g. *Mina, buy, Mel, what, do* lexical constructions

In this way, the same ditransitive construction is involved in the active declarative form as well as in topicalized, clefted or questioned forms. That is, the recipient argument is an Object whether or not it appears directly after the verb or whether it appears as a distantly instantiated question word. It is, for example, the (non-echo) question construction that determines the fact that the *wh*-word appears sentence-initially in English.¹

¹ Given the syntactic specifications of the ditransitive construction as having two non-subject NP arguments, a separate but related construction is required to account for passives of ditransitive. Supporting the idea that there exists a passive-ditransitive construction is the fact that the actual form of the passive-ditransitive is not strictly predictable. At one time in the history of English, no passive was allowed at all (Allen 2001). In some languages, both the recipient and patient arguments can passivize, where as in English only the recipient argument can passivize (Alsina and Mchombo 1990; Polinsky 1998).

Ambridge and Goldberg (2008) provide evidence that suggests that speakers determine which constructions can be combined, at least in part, on the basis of the compatibility of the information structure properties of the constructions involved. They investigated the relative “island” status of the following sentence complement constructions: “bridge” verb complements, manner-of-speaking verb complements and factive verb complements. Questionnaire data demonstrated a strong correlation between acceptability judgments and a negation test used to operationalize the notion of “backgroundedness”. The findings strongly support the idea that these constructions act as islands to wh-extraction to the degree that they are backgrounded in discourse.

8. Representation of Constructions

There are various formalisms for constructions. Arguably, the most complete and well-worked out is the feature-value matrices used by several researchers in the constructionist framework (cf. Fillmore, this volume; Michaelis, this volume; Kay & Fillmore 1999; Michaelis & Lambrecht 1996; Sag 1997). A great deal of work within computational linguistics has been built upon that formalism; no mainstream generative grammar formalism comes to close to it in terms of detail, rigor, or coverage. Jackendoff has developed another excellent formalism that focuses more on semantic representation (Culicover & Jackendoff 2005; Jackendoff 1990). Work by Jeff Elman, Amy Perfors, Morten Christensen, Harold Bayaan, Bergen and Chang, and Rens Bod have developed other formalizations.

I have avoided using all but the most minimal formalization in my own work because I believe the necessary use of features that formalism requires misleads researchers into believing that there might be a finite list of features or that many or most of the features are valid in cross-linguistic work. The facts belie this implication. The meanings or functions of words and constructions do not lend themselves to semantic decomposition (cf. Fillmore 1977; Langacker 1987; Lakoff 1987; Goldberg 1995; pace Jackendoff 1983; Wierzbicka 1988), and often-suggested syntactic primitives such as noun, subject, agreement, or agent actually vary cross-linguistically as well (cf. e.g., Croft 2001). Again, however, decisions about whether and how to formalize need not necessarily divide constructionists.

9. Comparison with mainstream generative and traditional functional frameworks

The emphasis on the pairing of function with form is what sets construction grammars apart from both other generative approaches (which tend to downplay function) and other functional approaches (which tend to downplay form). At the same time, constructionists bring these two approaches together in some ways. Constructionists recognize the importance of two major questions that have been brought to the fore by generative grammarians: 1) How can all of the complexities of language be learned such that we are able to produce an open-ended set of utterances? And 2) How are cross-linguistic generalizations (and language internal generalizations) accounted for?

Certain mainstream generative grammar frameworks share the basic idea that some type of meaning is directly associated with some type of form, independently of particular lexical items (cf. also Borer 1994; Hale & Keyser 1997 ; Marantz 1997). Because syntax plays a role in contentful meaning, these other approaches have been called “neo-constructionist.” However, the approaches are fundamentally different from the type of constructionist approaches just outlined. For example, these mainstream generative accounts do not adopt a non-derivational (monostratal) approach to syntax, but appeal instead of underlying levels of representation in which constituents (or entities that are never realized) move around abstract trees. Moreover, these accounts emphasize rough paraphrases instead of speakers’ detailed construals of situations. Thus neither the syntax nor the semantics is akin to that adopted by constructionists in the present volume. Empirical challenges that “neo-constructionist” generative accounts face are discussed in some detail in Goldberg (2006).

Constructionists have also borrowed much from traditional “functionalist” approaches. Constructionists rely heavily on traditional functionalist corpus methodologies (cf. Gries, this volume). Both approaches also emphasize the usage-based nature of language and the importance of general cognitive processes.

10. Conclusion

It is fair to say that the constructionist approach is the fastest growing linguistic and interdisciplinary approach to language. A growing number of researchers have made

constructions the cornerstone of their linguistic theories (e.g., Croft 2001; Fillmore et al. 1988; Goldberg 1995; 2006; Sag et al. 2003) as well as theories of language acquisition (e.g., Tomasello 2003), historical change (Traugott 2008; Bybee 2010); morphology (Blevins 2001; Booij 2002; 2005; Spencer 2001), processing (Gries 2003), and machine learning (Bod 1998; Perfors et al. 2007).

I prefer to use the term, *constructionist approaches*, rather than X or Y Grammar. There's a huge amount of work to do both in terms of linguistic research and in terms of building bridges between linguistics and other disciplines. Too many researchers in related fields (psychology, communication, anthropology, computer science) gave up on linguistics when it became clear that generative grammar was either unfathomable, wrong-headed or both. The same researchers tend to find constructionist approaches much more interesting, accessible and useful, and we could stand to gain a great deal by talking and working with them. There's of course also a great deal of work to be done involving standard linguistic analyses with the goal of gaining a deep understanding of the richness and complexity of language. While it is of course important to openly discuss substantive points of disagreement, the field might be well-served from moving away from creating divisions among closely related frameworks by labeling them X, Y or Z Grammars.

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Wray, Alison. (2002). *The Transition to Language*. New York: Oxford University Press.

A constructionist approach to emotion-brain correspondence.Â In contrast to this faculty psychology approach, recent research suggests that emotions are instead constructed out of more fundamental psychological processes that are not themselves specific to emotion (for reviews see Barrett, 2006; Barrett, 2009; Cunningham et al., 2013; Lindquist, 2013; Lindquist & Gendron, 2013; Lindquist, Wager, Kober, Bliss-Moreau & Barrett, 2012).