FROM USAGE TO GRAMMAR: THE MIND'S RESPONSE TO REPETITION

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A usage-based view takes grammar to be the cognitive organization of one's experience with language. Aspects of that experience, for instance, the frequency of use of certain constructions or particular instances of constructions, have an impact on representation that is evidenced in speaker knowledge of conventionalized phrases and in language variation and change. It is shown that particular instances of constructions can acquire their own pragmatic, semantic, and phonological characteristics. In addition, it is argued that high-frequency instances of constructions undergo grammaticization processes (which produce further change), function as the central members of categories formed by constructions, and retain their old forms longer than lower-frequency instances under the pressure of newer formations. An exemplar model that accommodates both phonological and semantic representation is elaborated to describe the data considered.*

1. USAGE-BASED GRAMMAR. The observance of a separation between the use of language and its internalized structure can be traced back to de Saussure's well-known distinction between LANGUE and PAROLE (1915 [1966]:6–17), which was adhered to by American structuralists and which made its way into generative grammar via Chomsky's distinction between competence and performance (Chomsky 1965). In American structuralism and in generative grammar, the goal of studying langue/competence was given highest priority and the study of language use in context has been considered to be less relevant to the understanding of grammar. Other goals for linguistic research which do not isolate the study of language structure from language use, however, have been pursued through the last few decades by a number of functionalist researchers (for instance, Greenberg 1966, Givón 1979, Hopper & Thompson 1980, Bybee 1985) and more recently by cognitive linguists as well, all working to create a broad research paradigm under the heading of USAGE-BASED THEORY (Barlow & Kemmer 2000, Langacker 2000, Bybee 2001).

While all linguists are likely to agree that grammar is the cognitive organization of language, a usage-based theorist would make the more specific proposal that grammar is the cognitive organization of one's experience with language. As is shown here, certain facets of linguistic experience, such as the frequency of use of particular instances of constructions, have an impact on representation that we can see evidenced in various ways, for example, in speakers' recognition of what is conventionalized and what is not, and even more strikingly in the nature of language change. The proposal presented here is that the general cognitive capabilities of the human brain, which allow it to categorize and sort for identity, similarity, and difference, go to work on the language events a person encounters, categorizing and entering in memory these experiences. The result is a cognitive representation that can be called a grammar. This grammar, while it may be abstract, since all cognitive categories are, is strongly tied to the experience that a speaker has had with language.

In addition to presenting evidence that specific usage events affect representation, I also address the issue of the type of cognitive representation that is necessary to accom-

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modate the facts that are brought to light in this usage-based perspective. I argue for morphosyntax, as I have for phonology, that one needs an exemplar representation for language experience, and that constructions provide an appropriate vehicle for this type of representation.

2. CONVERGING TRENDS IN LINGUISTIC THEORY. In recent years many researchers have moved toward a consideration of the effect that usage might have on representation. One practice that unites many of these researchers is a methodological one: it is common now to address theoretical issues through the examination of bodies of naturally occurring language use. This practice has been in place for decades in the work of those who examine the use of grammar in discourse with an eye toward determining how discourse use shapes grammar, notably Givón, Thompson, Hopper, and DuBois (e.g. DuBois 1985, Givón 1979, Hopper & Thompson 1980, Ono et al. 2000, Thompson & Hopper 2001). In addition, researchers in sociolinguistic variation, such as Labov, Sankoff, and Poplack (e.g. Labov 1972, Poplack 2001, Poplack & Tagliamonte 1999, 2001, Sankoff & Brown 1976), have always relied on natural discourse to study the inherent variation in language use.

The importance of usage- and text-based research, always important to traditional historical linguistics, is especially emphasized in functionalist work on grammaticization, for example, Bybee 2003a,b, Hopper & Traugott 1993, and Poplack & Tagliamonte 1999. In fact, the study of grammaticization has played a central role in emphasizing the point that both grammatical meaning and grammatical form come into being through repeated instances of language use. This line of research along with the discourse research mentioned above indeed seeks to explain the nature of grammar through an examination of how grammar is created over time, thus setting a higher goal for linguistic explanation than that held in more synchronically oriented theory, which requires only that an explanatory theory provide the means for adequate synchronic description (Chomsky 1957).

Of course, one major impetus for the shift to analysis of natural language use is the recent availability of large electronic corpora and means of accessing particular items and patterns in such corpora. Through the work of corpus linguists, such as John Sinclair (1991), computational linguists, such as Dan Jurafsky and colleagues (e.g. Jurafsky et al. 2001, Gregory et al. 1999), and those who are proposing probabilistic or stochastic grammar, such as Janet Pierrehumbert (e.g. 2001) and Rens Bod (1998), access to the nature and range of experience an average speaker has with language is now within our grasp. Studies of words, phrases, and constructions in such large corpora present a varying topography of distribution and frequency that can be quite different from what our intuitions have suggested. In addition, the use of large corpora for phonetic analysis provides a better understanding of the role of token frequency and specific words and collocations in phonetic variation.

At the same time a compatible view of language acquisition has been developing. The uneven distribution of words and constructions in speech to children is mirrored somewhat in the course of acquisition: children often produce their first instances of grammatical constructions only in the context of specific lexical items and later generalize them to other lexical items, leading eventually to productive use by the child; see work by Tomasello, Lieven, and their colleagues (e.g. Lieven et al. 2003, Savage et al. 2003, Tomasello 2003).

3. FINDINGS. As linguists turn their attention to natural language use, they find a fascinating new source of insights about language. One finding that seems to hold

across many studies and has captured the interest of researchers is that both written and spoken discourse are characterized by the high use of conventionalized word sequences, which include sequences that we might call formulaic language and idioms, but also conventionalized collocations (sometimes called 'prefabs'; Erman & Warren 2000). Idioms are conventionalized word sequences that usually contain ordinary words and predictable morphosyntax, but have extended meaning (usually of a metaphorical nature), as in these examples: *pull strings*, *level playing field*, *too many irons in the fire*. Idioms are acknowledged to need lexical representation because of the unpredictable aspects of their meaning, but as Nunberg and colleagues (1994) point out, they are not completely isolated from related words and constructions since many aspects of their meaning and form derive from more general constructions and the meaning of the component words in other contexts. Idioms provide evidence for organized storage in which sequences of words can have lexical representation while still being associated with other occurrences of the same words, as schematized in this diagram from Bybee 1998.[1]

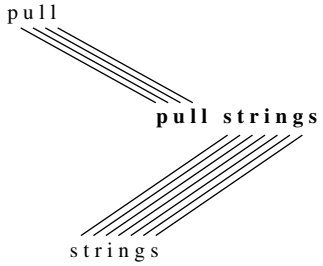

FIGURE 1. The relation of an idiom to its lexical components.

Idioms have a venerable history in linguistic study, but prefabs or collocations have attracted less attention through recent decades (but see Bolinger 1961, Pawley & Syder 1983, Sinclair 1991, Biber et al. 1999, Erman & Warren 2000, and Wray 2002). Prefabs are word sequences that are conventionalized, but predictable in other ways, for example, word sequences like *prominent role*, *mixed message*, *beyond repair*, and *to need help*. In addition, phrasal verbs (*finish up*, *burn down*) and verb-preposition pairings (*interested in*, *think of*, *think about*), which are pervasive in English as well as other languages, can be considered prefabs, though in some cases their semantic predictability could be called into question. These conventional collocations occur repeatedly in discourse and are known to represent the conventional way of expressing certain notions (Erman & Warren 2000, Sinclair 1991, Wray 2002). Erman and Warren (2000) found that what they call prefabricated word combinations constitute about 55% of both spoken and written discourse. Speakers recognize prefabs as familiar, which indicates that these sequences of words are stored in memory despite being largely predictable in form and meaning.

The line between idiom and prefab is not always clear since many prefabs require a metaphorical stretch for their interpretation. The following may be intermediate examples, where at least one of the words requires a more abstract interpretation: *break a habit*, *change hands*, *take charge of*, *give (someone/something) plenty of time*, *drive*

[1] See Barlow 2000 for an interesting discussion of the way a conventionalized expression can undergo permutations that demonstrate that its compositionality is also maintained.

(someone) crazy. I bring up these intermediate cases to demonstrate the gradient nature of these phenomena; the lack of a clear boundary between idioms and prefabs would also suggest that both types of expression are stored in memory.

What we see instantiated in language use is not so much abstract structures as specific instances of such structure that are used and reused to create novel utterances. This point has led Hopper (1987) to propose grammar as emergent from experience, mutable, and ever coming into being rather than static, categorical, and fixed. Viewed in this way, language is a complex dynamic system similar to complex systems that have been identified, for instance, in biology (Lindblom et al. 1984, Larsen-Freeman 1997). It does not have structure a priori, but rather the apparent structure emerges from the repetition of many local events (in this case speech events). I describe here some data that help us understand what some of the properties of an emergent, usage-based grammar might be.

4. GOALS OF THE ARTICLE. There are a number of important consequences of the fact that speakers are familiar with certain multiword units. For the present article I focus on the implications of the fact that the use of language is lexically particular; certain words tend to be used in certain collocations or constructions. My goal is to explore the implications of this fact for cognitive representation. I discuss a series of cases in which there is evidence that lexically particular instances of constructions or word sequences are stored in memory and accessed as a unit. I further discuss facts that show that the frequency of use of such lexically particular collocations must also be a part of the cognitive representation because frequency is a factor in certain types of change. I argue that in order to represent the facts of usage, as well as the facts of change that eventually emerge from this usage, we need to conceive of grammar as based on constructions and as having an exemplar representation in which specific instances of use affect representation. The model to be proposed, then, uses a type of exemplar representation with constructions as the basic unit of morphosyntax (see §§6–9 and 13).

After discussing further aspects of the approach taken, five types of evidence are discussed. First, evidence for the importance of frequency in the developing autonomy of new constructions in grammaticization is presented. Second, I discuss the effects of context and frequency of use on the development of conventionalized collocations and grammatical constructions. Third, I briefly treat phonological reduction in high-frequency phrases. Fourth, I turn to the organization of categories within constructions where it is seen that in some cases high-frequency exemplars serve as the central members of categories. Finally, the fact that high-frequency exemplars of constructions can resist change is taken as evidence that such exemplars have cognitive representation.

5. FREQUENCY EFFECTS ON PROCESSING AND STORAGE. Before turning to the evidence, I briefly review three effects of token frequency that have been established in recent literature.

First, high-frequency words and phrases undergo phonetic reduction at a faster rate than low- and mid-frequency sequences (Schuchardt 1885, Fidelholtz 1975, Hooper 1976, Bybee & Scheibman 1999, Bybee 2000b, 2001). This REDUCING EFFECT applies to phrases of extreme high frequency like *I don't know*, which shows the highest rate of *don't* reduction (Bybee & Scheibman 1999), and also to words of all frequency levels undergoing gradual sound change, such as English final t/d deletion or Spanish [ð] deletion, both of which affect high-frequency words earlier than low-frequency words (Bybee 2001, 2002, Gregory et al. 1999). The explanation for this effect is that the

articulatory representation of words and sequences of words is made up of neuromotor routines. When sequences of neuromotor routines are repeated, their execution becomes more fluent. This increased fluency is the result of the establishment of a new routine, as when a group of words comes to be processed as a single unit (Anderson 1993, Boyland 1996). In the new routine articulatory gestures reduce and overlap as the routine is repeated.

A second effect of token frequency (the CONSERVING EFFECT) relates to the morphosyntactic structure of a string. High-frequency sequences become more entrenched in their morphosyntactic structure and resist restructuring on the basis of productive patterns that might otherwise occur. Thus among English irregular verbs the low-frequency verbs are more likely to regularize (*weep*, *weeped*) while the high-frequency verbs maintain their irregularity (*keep*, *kept*). My proposal to explain this tendency (Hooper 1976, Bybee 1985) is that frequency strengthens the memory representations of words or phrases, making them easier to access whole and thus less likely to be subject to analogical reformation. This effect applies to syntactic sequences as well, allowing higher-frequency exemplars to maintain a more conservative structure (Bybee & Thompson 1997). In §15 the example of the maintenance of the older type of negation in English (*no*-negation) with high-frequency constructions is discussed.

The third effect (AUTONOMY) is related to the second one. Autonomy refers to the fact that morphologically complex forms (or strings of words) of high frequency can lose their internal structure as they become autonomous from etymologically related forms (Bybee 1985). This can be seen for example in the way that words with derivational affixes become less transparently related to their base forms as they become more frequent (Bybee 1985, Hay 2001). Hay (2001) argues that the semantic opacity of words like *dislocate* is due to the fact that their complex forms are more frequent than the bases from which they were originally derived. The effect applies to inflection only in cases of extreme high frequency, where it leads to suppletion. Thus *went* was formerly the past tense of *wend* but (for unknown reasons) it increased in frequency and moved away from *wend*, joining *go* to become the past tense of that verb. This effect also applies in grammaticization when sequences that are originally complex (such as *be going to*) lose their semantic and syntactic transparency and move away from other instances of the words *be*, *go*, and *to*.

In discussing these effects here and elsewhere, I refer to high and low frequency and to extreme high frequency without specifying exactly what these values mean in numerical terms. Thus, the conserving effect applies to high-frequency items but autonomy appears to affect only strings of extreme high frequency. The reducing effect appears to be graded in that the higher the frequency of the string, the greater its reduction. The phenomenon discussed in §14 in which higher-frequency items form the centers of categories requires that the item not be so high in frequency as to be autonomous. The impossibility at the moment of specifying ranges for extreme high, medium, and low is only a function of the state of our knowledge. As more empirical studies appear, absolute frequency ranges for each phenomena will eventually be specifiable.

6. CONSTRUCTION-BASED REPRESENTATIONS. For the phenomena to be examined here, cognitive representations based on constructions turn out to be highly effective. Several versions of grammar in terms of constructions have been discussed in the literature. Proposals have been made by Fillmore and Kay (e.g. Fillmore et al. 1988, Kay & Fillmore 1999), Goldberg (1995, 2003), Lakoff (1987), Langacker (1987), and Croft

(2001). All of these proposals agree on a basic point: Cognitive representations of grammar are organized into constructions which are partially schematic, conventionalized sequences of morphemes with a direct semantic representation. According to Goldberg, all of the following constitute constructions: (i) idioms with fixed lexical content: *go great guns*; (ii) idioms that are partially filled: *jog* <someone's> *memory*; (iii) constructions with some fixed material: *he made his way through the crowd*; and (iv) fully abstract constructions: *they gave him an award*.

It is interesting to note that almost all constructions contain some explicit morphological material, tying them fairly concretely to specific words or morphemes (e.g. *way* and the possessive pronoun in (iii)). The ditransitive construction in (iv) contains no specific phonological material that identifies it as the ditransitive. Only the word order signals this. However, it should be noted that only a small class of verbs can occur in this construction so that it also has a grounding in lexical items.

In fact, the continuum in (i) through (iv) shows examples from the most lexically explicit to the most schematic. Prefabs can also be considered to be instances of constructions that are lexically filled. Given the high use of prefabs and idioms in natural speech, it appears that a good deal of production (and perception) refers to sequences of prespecified lexical choices rather than to abstract grammar. For this reason, a model that builds a grammar from specific instances of language use, such as an exemplar model or a connectionist model, seems appropriate. For present purposes, I focus on representation in an exemplar model.

7. EXEMPLAR REPRESENTATION. Several versions of exemplar theory have been proposed in the psychology literature on categorization (Nosofsky 1988, Goldinger 1996). The version of exemplar theory adopted here has found its way into linguistics as a means of representing phonetic variation (K. Johnson 1997, Pierrehumbert 2001, 2002). In this model, every token of experience is classified and placed in a vast organizational network as a part of the decoding process. The major idea behind exemplar theory is that the matching process has an effect on the representations themselves; new tokens of experience are not decoded and then discarded, but rather they impact memory representations. In particular, a token of linguistic experience that is identical to an existing exemplar is mapped onto that exemplar, strengthening it. Tokens that are similar but not identical (differing in slight ways in meaning, phonetic shape, pragmatics) to existing exemplars are represented as exemplars themselves and are stored near similar exemplars to constitute clusters or categories. Thus the phonetic shape of a word might consist of a set of phonetic exemplars that are very similar to one another.[2]

Exemplar clusters can also be arranged hierarchically. A set of exemplars that are judged to be similar phonetically and represent the same meaning are clustered together and are represented as a word or phrase. Constructions emerge when phrases that bear some formal similarity as well as some semantic coherence are stored close to one another.

According to K. Johnson (1997), phonetic exemplars are tagged for an array of information about their occurrence: phonetic context, semantic and pragmatic information, other linguistic context, and social context. Thus an exemplar is an extremely

[2] In some versions of exemplar representation, exemplars are scattered randomly through space. Only when categorization of a new exemplar is necessary are they organized by similarity (Chandler 2002, Skousen 1989). Because linguistic categorization takes place so often I propose that linguistic categories (in the form of phonetic, morphosyntactic, semantic/pragmatic characteristics) are more entrenched in the sense that frequently used categorizations have an impact on neurological organization.

complex item. Not only does the phonetic side of a word or phrase take different forms and thus require multiple exemplars, but the semantic and contextual sides also encompass ranges of variation. It is necessary, then, to expand the theory to encompass exemplars that differ by any of the facets of a linguistic sign. That is, the particular semantic interpretations associated with tokens of use also contain details and nuances that lend themselves to exemplar representation. When meanings are the same, they are mapped onto the same exemplar, but when there are differences, separate exemplars are created. Similarly, the memory for contexts of use for words and constructions can be organized in exemplar clusters. These points are further illustrated in §13.

In applying this kind of model to linguistic data, it is important to bear in mind just which aspects of the model are helpful to our understanding of language. Thus I focus on the following factors because they help us understand how constructions come into being and change over time.

a. Exemplar representations allow specific information about instances of use to be retained in representation.
b. Exemplar representations provide a natural way to allow frequency of use to determine the strength of exemplars.
c. Exemplar clusters are categories that exhibit prototype effects. They are organized in terms of members that are more or less central to the category, rather than in terms of categorical features.

At first it might seem rather implausible to suppose that every token of language use encountered by a speaker/hearer has an effect on cognitive representation. Therefore it is important to consider how these notions can be applied to language.

First, we have to move beyond the goal of structural and generative linguistics to try to establish which features or forms are stored in the lexicon and which are not (cf. Langacker's rule/list fallacy (1987)) and take a more probabilistic view of representation. A phrase that is experienced only once by an adult is likely to have only a minute impact on representation compared to all of the accumulated exemplars already existing. Compare this to a young child whose experience is much more limited: each new token of experience has a greater impact on his/her representations. In addition, given a highly organized network of morphemes, words, phrases, and constructions, it will be difficult to distinguish between specific storage (storing the relatively low-frequency phrase such as *beige curtains* as a unit) and distributed storage (mapping the two words onto existing exemplars of these words) because both types of processing are occurring at the same time. Only when a sequence is repeated will access to it as a unit rather than by its parts become more efficient (Boyland 1996, Haiman 1994, Hay 2001). Thus the question of storage or nonstorage will always be a probabilistic one, based on the experience of the language user.

Second, human memory capacity is quite large. Nonlinguistic memories are detailed and extensive, suggesting a strong memory capacity for experienced phenomena (Goldinger 1996, K. Johnson 1997). In particular it is interesting to consider how memory for repeated experiences is represented, because an important feature of linguistic experience is the regular repetition of phonological strings, words, and constructions. Consider a repeated experience, such as walking from your office on campus to your classroom. You probably take much the same route each time, and although many of the perceptual details are not important, you register them anyway. Was there a pigeon on the path? Did you see your colleague coming from the other direction? These details are registered in memory so that if they are repeated, it is noted and eventually you

may come to expect to see a pigeon on the path or your colleague returning from his class. At the same time, memories decay over time. If in fact you never see your colleague again on that path, you may forget the one time you saw him/her there. Both of these properties of memory—the build up of strength in repeated memories and the loss of nonrepeated memories—are important for explaining linguistic phenomena.

Third, it is clear that linguistic memories represented as exemplars can undergo considerable reorganization, particularly when change is ongoing in a language. Examples of reorganization of constructions are presented in §§10–12, but for now I mention a phonetic example. Consider the case of a sound change occurring at a word boundary which sets up variation among the forms of a word, such as in the final syllable of a Spanish word ending in [s] in dialects where it is reduced to [h] before a consonant but maintained before a vowel. In a case like this, the phonetically conditioned variation is not maintained. Rather, the more frequent variant, the one used before a consonant, is extended to use before a vowel. This gives evidence for considerable reorganization within the exemplar cluster resulting in a smaller range of variation (Bybee 2000a, 2001). (For experiments that model category formation from exemplars, see Pierrehumbert 2001, 2002, Wedel 2004.)

The cases I discuss here provide evidence that linguistics needs a model that allows particular instances of use to affect representation. It is important to note that there are several models that have been computationally tested that have this property; for instance, connectionist models work on the principle that detailed information is the basis of more general patterns. Such models have been tested on a variety of cognitive phenomena, but it may be that language will present both the toughest testing ground for such theories and the best source of data for our understanding of categorization and memory, especially memory for repeated events.

8. EXEMPLAR REPRESENTATION OF CONSTRUCTIONS. As mentioned above, exemplars of words or phrases that are similar on different dimensions are grouped together in cognitive representation. From such a grouping a construction can emerge. For example, an exemplar representation of a partially filled construction would have experienced tokens mapping onto the constant parts of the construction exactly, strengthening these parts, while the open slots would not match exactly. If there are similarities (in particular, semantic similarities) among the items occurring in the open slot, a category for these items would begin to develop. Thus in a Spanish example that I discuss further in §14, adjectives following the verb *quedarse* 'to become', such as *quieto*, *tranquilo*, or *inmóvil*, would be categorized together due to their semantic coherence, and this category would then predict novel uses of *quedarse* + adjective (Bybee & Eddington 2006).

(1) Example: Spanish *quedarse* + ADJECTIVE 'become ADJ'

$$\text{quedarse} \left\{ \begin{array}{ll} \text{tranquilo} & \text{'tranquil'} \\ \text{quieto} & \text{'quiet, still'} \\ \text{inmóvil} & \text{'still, immobile'} \end{array} \right\}$$

Further details about the mapping of form and meaning in constructions is presented in §13.

9. EFFECTS OF REPETITION ON PARTICULAR INSTANCES OF CONSTRUCTIONS. The next three sections of this article contain a discussion of the effects of repetition and context of use on particular exemplars of constructions. The examples provided are intended as empirical evidence that specific instances (exemplars) of constructions are part of the cognitive representation of language and that frequency of use has an impact on

the nature of these representations. There are various degrees of effect, depending upon the extent of the frequency.

(i) low levels of repetition lead to conventionalization only (as in prefabs and idioms)
(ii) higher levels of repetition can lead to the establishment of a new construction with its own categories
(iii) extreme high frequency leads to the grammaticization of the new construction, the creation of grammatical morphemes, and changes in constituency

The discussion begins with grammaticization (listed third) because, as a phenomenon of linguistic change, its properties have been well studied.

10. GRAMMATICIZATION. The idea that frequency of use affects the formation of grammar has been explored in some detail in studies on grammaticization (Haiman 1994, Boyland 1996, Bybee 2003a). Grammaticization (or grammaticalization) is the creation of a new grammatical morpheme and a new construction out of a particular instance of an old construction (Heine et al. 1991, Hopper & Traugott 1993, Bybee et al. 1994). In particular, an existing construction with specific lexical items in it becomes more frequent, changes in various ways, and becomes a new construction. By examining how this process occurs we learn about the cognitive representation of constructions. The example to be discussed is the development of *be going to* as a marker first of intention and then of future in English (Danchev & Kytö 1994).

In the mid to late sixteenth century, English *be going to* was an example of a purpose construction sometimes used in the progressive, as shown in these examples from the works of William Shakespeare.

(2) Don Alphonso,
With other gentlemen of good esteem,
Are journeying to salute the emperor
And to commend their service to his will. (*Two gentlemen of Verona*, I.3)

(3) **I was sending to** use Lord Timon myself . . . (*Timons of Athens*, II.2)

The most frequent instance of this construction used *go* as the main verb. In the complete works of William Shakespeare there are only six instances of *be going to* in a purpose construction and only two instances with other verbs (2 and 3).[3] This construction gradually gained in frequency over subsequent centuries (Danchev & Kytö 1994).

(4) . . . the kings
and the princes, our kindred, **are going to** see the queen's picture.
(*Winter's tale*, V.2)

(5) Sir, the Germans desire to have three of your horses: the duke himself will be to-morrow at court, and they **are going to** meet him. (*Merry wives of Windsor*, IV.3)

[3] Shakespeare's works also contain a number of purpose clauses with *-ing* forms without a copula that function as subordinate clauses. It is possible that these uses contribute to the establishment of the intention interpretation for the *be going to* construction.

Besides, I met Lord Bigot and Lord Salisbury,
With eyes as red as new-enkindled fire,
And others more, **going to seek the grave**
Of Arthur, who they say is kill'd to-night
On your suggestion. (*King John*, IV.1)

Exemplars of the purpose clause construction were originally grouped together in cognitive representation.

(6) SUBJ [(BE) { traveling / journeying / returning / going } to VERB]
PURPOSE

As the sequence with the originally lexical verb *go* occurred (as it still does) more frequently, it gradually gained in strength (represented in 6 by its larger font size). There are several consequences of the strength of representation afforded by high frequency in experience, as is discussed below in greater detail. The general claim is that this more frequent sequence gradually moved away from its source construction, becoming more autonomous. Thus a new construction was created and, as I explain below, certain pragmatic inferences came to be associated with it.

(7) [SUBJECT + *be going* + *to* + VP]$_{\text{INTENTION, FUTURE}}$

It is also well known that this construction has been undergoing phonological reduction leading to the reduction of *going to* to [gənə], often spelled *gonna*.

As I argued in Bybee 2003a, the changes that take place in grammaticization are conditioned at least in part by high frequency of use. The following is a brief explanation of how frequency of use helps to condition the changes that took place in this construction. Note that all of these changes are intricately interrelated.

First, as I argued above, increased phonological reduction takes place when words and phrases are often repeated (the reducing effect). Thus the growing token frequency of *be going to* leads to the creation of a neuromotor routine that is processed as a single unit and can undergo phonological reduction, defined as a decrease in the magnitude of gestures and an increase in their overlap. Indeed, the highest frequency expression involving *be going to* is *I'm going to*, which is often produced as [aimənə].

Second, the autonomy of a new construction is conditioned by frequency as explained in §5. That is, as a particular string grows more frequent, it comes to be processed as a unit rather than through its individual parts. As it is accessed more and more as a unit, it grows autonomous from the construction that originally gave rise to it. It loses its association with the purpose construction and also with the other instances of the verb *go*.

Third, the loss of the specific meaning of movement in space and the addition of inferential meaning from the context also rely on frequency of use. The *be going to* construction in many contexts carried the pragmatic inference of intention, as shown in the following exchange from *Two gentlemen of Verona* as cited in Hopper & Traugott 1993.

(8) *Duke* Sir Valentine, whither away so fast?
Val. Please it your grace, there is a messenger
That stays in to bear my letters to my friends,
And I **am going to** deliver them.
(1595, Shakespeare, *Two gentlemen of Verona*, III.i.51)

In this example, the Duke's literal question is 'where are you going?'. Valentine's answer does not specify location, but rather intention. Interestingly, that is actually what the Duke wanted to know. As Traugott (1989) and Traugott and Dasher (2002) have argued, inferences arising frequently with a construction can become part of the

meaning of the construction (by the conventionalization of implicature; see Grice 1975, Horn 1985). Given that the inference of intention often accompanies the use of this construction, the result is that 'intention' becomes part of the meaning of the construction. As seen in §13, the meaning and contextual implications of a construction contribute to the formation of exemplar clusters much as the phonetic variants do. These clusters are susceptible to the same sort of reorganization discussed with respect to phonetics: high-frequency semantic/pragmatic exemplars come to dominate the cluster and lower-frequency exemplars may be lost, bringing about gradual semantic change.

Finally, because items that are used together frequently come to be processed together as a unit, changes in constituency and category take place. Thus *going to* as the constant part of this construction becomes a single unit not just phonologically, but also syntactically. As the construction acquires new nuances of meaning and loses its motion sense, the following verb is taken to be the main verb. This process, known as 'reanalysis', is viewed in a usage-based perspective as being gradual, that is, as consisting of a gradual change in the exemplar cluster (Haspelmath 1998) in contrast to the generative view that reanalysis is of necessity abrupt (Lightfoot 1979, 1991, Roberts & Roussou 2003).

Thus grammaticization, which is the major vehicle for the creation of new grammatical morphemes, demonstrates the need for the cognitive representation of instances of constructions, because if specific instances of the purpose construction (with *be going to*) were not registered in memory, the construction could not be subject to the processes that comprise grammaticization. In addition, the various effects that repetition has on an exemplar of a construction demonstrate that cognitive representations are affected by frequency or repetition.

11. NEW CONSTRUCTIONS WITHOUT GRAMMATICIZATION. In Bybee 2003a, I defined grammaticization as the creation of a new construction out of a particular instance of an existing construction (see also Traugott 2003). But in fact, this definition is not completely accurate because new constructions can arise without the hallmark of grammaticization, namely, the creation of a new grammatical morpheme. In this section I examine the cases of new constructions arising without grammaticization. The goal of this section is to present further evidence that particular instances of constructions that have been experienced by a speaker must be present in his or her cognitive representation of language.

It has already been noted that idioms with specific metaphorical meaning must have cognitive representation even though they are still related to the lexemes and construction from which they arose (Nunberg et al. 1994). Similarly, as noted earlier, prefabs, which are conventionalized but more transparent in meaning, must also have a representation (because they are conventional), but that representation is associated with the representations for their component parts.

The case I focus on here is the creation of constructions that carry specific pragmatic implications while still maintaining at least a surface resemblance to the construction from which they arose. The example is a construction discussed by Kay and Fillmore (1999) and by C. Johnson (1997). Kay and Fillmore provide the following dialogue from a popular joke.

(9) Diner: Waiter, **what's this fly doing in my soup**?
Waiter: Why, madam, I believe that's the backstroke. (Kay & Fillmore 1999)

The joke shows the possible ambiguity of the highlighted sequence. As Kay and Fillmore point out, the usual interpretation of 'what is X doing Y' is one of surprise at

incongruity accompanied by more than a hint of disapproval (i.e. a negative subjective interpretation). Because it is syntactically indistinct from the information question construction from which it presumably arose, it gives the clever waiter license to interpret it as a literal question about what the fly is doing.

Since there is nothing in the form or content to suggest a meaning of incongruity, how did an ordinary WH-question with *doing* and a locative phrase acquire these implications? C. Johnson (1997:17) points out that certain locative expressions have an ambiguity such that they can either apply to an activity or an individual participant in that activity.

(10) What are you doing with that knife? = 'why do you have that knife?'
or the literal meaning = 'what are you **doing** with it?'

In many contexts either interpretation is acceptable.

The generalized implication of incongruity, often accompanied by disapproval, which is so strong with this construction now, must have come from multiple instances of use in contexts in which these subjective evaluations were present by inference. In fact, these implications have been around for several centuries with little apparent change (C. Johnson, p.c.). A search of the quotations in the *Oxford English Dictionary* shows a construction with *do* in the simple present with these implications beginning in the fourteenth century. The example in 11 shows that the question is more about location than about doing.

(11) *c1430 Syr Tryam*. 431 **What do** ye here, madam? Fro whens come ye?

The example in 12 shows lingering ambiguity of the construction.

(12) *1470–85 MALORY Arthur* XIV. v,
What dost thow here? He ansuerd I doo neyther good nor grete ylle.
'What are you doing here? He answered I do neither good nor great ill.'

Clear implications of disapproval are evident later on.

(13) *1656 COWLEY Misc*., *Swallow* 3
Foolish Prater, **what do**'st thou
So early at my window **do**
With thy tuneless Serenade?

As C. Johnson points out, despite its close relation to regular WH-questions, the construction has developed special implications that have been passed down for centuries. Let us examine the question of how these implications come to be attached to this particular string of words. (For an analysis of how children acquire the implications that go with this construction, see C. Johnson 1997.)

The implication of disapproval becomes conventionalized with a WH-question with *do* and a locative phrase because of the ambiguity mentioned earlier and the fact that the construction with *do* happens to occur often in a context where the question implies disapproval. It appears that listeners and speakers follow and keep track of the implications that occur in particular contexts. In order to know that a certain implication has occurred frequently and is associated with a certain string of words, speakers must register the context and the implications from the very first exposure. They could not wait until they had heard the expression frequently in a certain context to register this in memory, because if they did not remember each time, they would not know that they had heard it before. Thus it seems clear that in order for this construction to acquire its special meaning, the learner/hearer must record in memory the implication of incongruity and disapproval from the very first exposure. Because this construction was earlier just a special instance of a more general construction, the changes it has

undergone indicate that particular instances of constructions are registered in linguistic memory indexed with their implications and contexts of use.

A further note of some interest is that in the eighteenth century, the construction appears to have been reconstituted with the progressive. That is, as the progressive becomes more established in English, the construction appears in the progressive, with all the same implications it had before.

(14) *1835 Aristophanes' Clouds* in *Blackw. Mag.* XXXVIII. 520
Str. Pray who's that in the basket hung up in the air? . . . Do tell me, I pray, **what** you're **doing** up there.
Soc. Aerobating—sun-musing, pacing air.

This reformation with the progressive suggests that the construction was not frequent enough nor autonomous enough to maintain the old form with simple *do*. As Johnson has argued, this special construction maintains its relation with the more general WH-question. Compare this to the high-frequency greeting *How do you do?* which has retained the simple present form alongside the progressive *How are you doing?*. In addition, it can be noted that the progressive, as a more recent grammaticization, maintains a fairly strong sense of action in progress and has other uses with negative affect (e.g. *Why are you standing there?*, *Why are you bothering me?*) (Murray 1989).[4] The reformation affirms that particular instances of general constructions can have their own representation while still being associated with the general construction.

12. SPECIAL PHONOLOGICAL REDUCTION. Just as phrases or instances of constructions can have special implications and special meaning, particular instances of constructions can also develop special phonology through frequency of use (Bybee & Scheibman 1999). Frequent phrases such as *I don't know*, *I don't think*, and many others show phonological reduction in excess of that which could be attributed to on-line reduction processes, such as that evident in other tokens of *don't*, as in *I don't inhale*, indicating that such reduction has accumulated in representation. High-frequency words and phrases have larger exemplar clusters and greater ranges of variation than low-frequency words and phrases. As phonological reduction occurs in production, high-frequency words and phrases have more opportunity to undergo reduction. When an already reduced exemplar is selected for production, it may undergo further reduction, leading to more advanced reduction in high-frequency phrases (Bybee 2000b, 2001, 2002, Pierrehumbert 2001). Note that in order for special phonological reduction to build up for frequent phrases the whole phrase has to have a representation.

The traditional proposal for what is stored in memory is that only forms with idiosyncratic phonology, semantics, or morphosyntax would be stored. From a diachronic point of view, however, it is clear that in order for a form to acquire special phonology, semantics, or morphosyntax, it must already be stored in memory. Thus exemplar

[4] When this article was delivered as the Presidential Address in 2005, Ray Jackendoff asked why this particular construction reformed with the progressive, while other formulaic constructions maintain older morphological forms, such as the phrase *far be it from me*. He asked why one reforms and the other does not. This is partly explained as noted in the text by the fact that the progressive, as a newly grammaticized form with its 'in progress' semantics, is particularly appropriate for the 'what's X doing Y' construction, while changing the subjunctive to indicative in the *far be it from me* case has no particular advantage. Also, *far be it from me* is a discourse marker that does not have open slots for other lexical items and is primarily if not exclusively used with the first person singular. That is, it is much more fixed than the 'what's X doing Y' construction.

representation is necessary to account for the emergence of new constructions, the development of special phonology or pragmatic implications in particular instances of constructions, and the existence of familiar prefabs.

Sections 14 and 15 discuss two cases that demonstrate that particular exemplars of constructions accrue strength in cognitive representation through repetition or frequency. Before turning to those cases, however, an examination of the way an exemplar model can account for the phonological and semantic changes discussed in the preceding sections is necessary. The following section contains an expansion of exemplar models that allows exemplar reorganization to take place on both the form and meaning sides of a linguistic sign.

13. EXEMPLAR REPRESENTATION OF THE LINGUISTIC SIGN. Illustrations of exemplar models of linguistic phenomena to date have been one-dimensional, focusing only on the phonetic representation of words and phrases. In the examples of grammaticization and the development of new constructions discussed in §§11 and 12, however, we have also seen that a model with exemplar representations is necessary for capturing the meaning and pragmatic context of constructions and how these change over time. Indeed, a linguistic sign (either a word or a construction) has both a form and a meaning. In addition, it requires an association between the form and the meaning. Using these examples of linguistic change, let us consider the nature of an exemplar representation of a linguistic sign.

We know that specific phonetic forms are associated cognitively with specific meanings and contexts because in grammaticization phonological reduction occurs only in the grammaticizing construction. Thus the form *gonna* is associated with the intention/future meaning and not with the movement-in-space or purpose meaning. In fact, there is currently much variation in both form and meaning for the *be going to* expression. For example, the full form can be used with intention or future meaning, as can the various reduced forms. Because both form and meaning contribute to exemplars, and because more frequent exemplars have stronger representations, the form/meaning pairings that occur most frequently have strong representations and the less frequent pairings could eventually disappear from use. Figure 2 shows an idealized pairing of meaning and form in which each phonetic variant (represented by the circles on the left) is uniquely associated with one semantic interpretation (represented by the circles on the right).

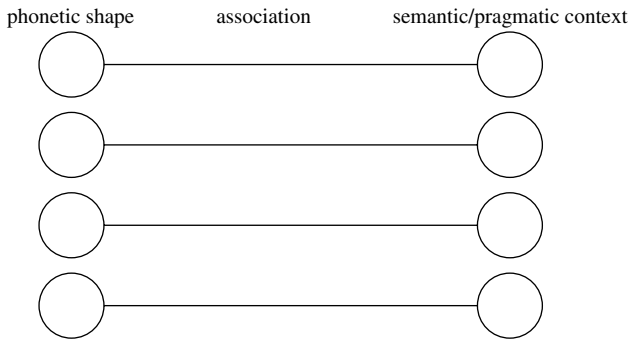

FIGURE 2. Four exemplars with phonetic shape associated uniquely with meaning and context.

Of course, in the variable phase of change, the situation is not so neat. As in the case of *be going to* some meanings will be associated with more than one phonetic shape and some phonetic shapes with more than one meaning, as shown in Figure 3.

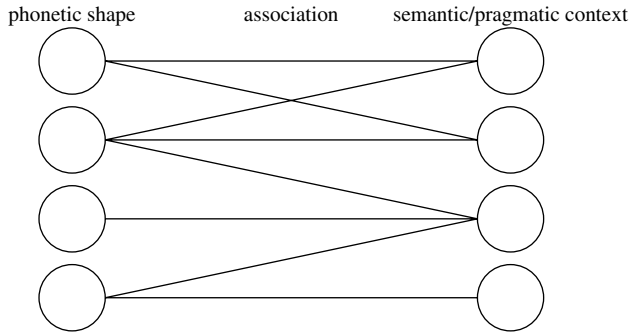

FIGURE 3. Variable associations of form and meaning in a linguistic sign.

I have already noted that a cluster of phonetic exemplars may undergo reorganization with the more frequent exemplar taking over in cases where it was not originally conditioned by the phonetic environment (Bybee 2000a, Pierrehumbert 2002, Wedel 2004). The same can occur with the semantic/pragmatic exemplars. If a particular pragmatic inference, such as intention in the *be going to* example, occurs very frequently in the semantic cluster of exemplars with a particular form, that meaning can become firmly associated with the form and cause it to show up in new contexts, such as those in which intention, but no movement in space, is signified.

Similarly, the associations between form and meaning may also reorganize, with the most frequent associations becoming fixed and conventionalized. For example, in the study of the reduction of *don't*, we found that forms with a full vowel in *I don't know* had a greater chance of occurring in a context where the meaning was literal or transparent, rather than contexts in which the phrase was used in a pragmatic sense as a conversational hedge or turn organizer (Bybee & Scheibman 1999, Scheibman 2000). However, the correspondence was not perfect: both the reduced and nonreduced vowel occurred in the transparent and pragmatic uses, as shown in Table 1.[5] Given the strong tendency of the full vowel to occur with the transparent meaning, one could easily imagine a point in the future in which the two uses are distinguished phonologically.

	FULL VOWEL	REDUCED VOWEL
transparent use	7	12
pragmatic use	1	17

TABLE 1. The relation between transparent versus pragmatic uses of *I don't know* and full vs. reduced vowel variants.

Using the type of diagram shown in Figs. 2 and 3, the associations between the reduced form of *don't* in the phrase *I don't know* and the transparent vs. pragmatic uses would appear as in Figure 4. The size of the circles corresponds to the frequency

[5] See Scheibman 2000 for further details. The 'turn organizer' use seems to be only associated with the reduced form.

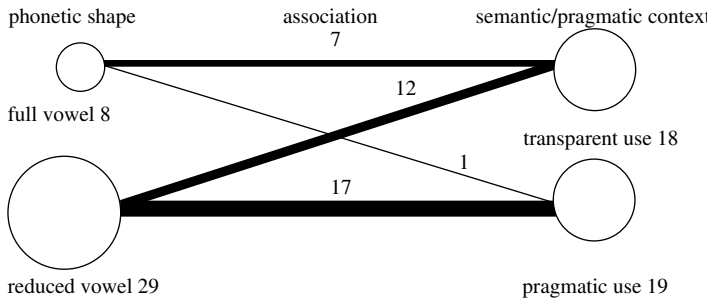

FIGURE 4. Phonetic and semantic associations in exemplars of *I don't know* (data from Bybee & Scheibman 1999).

of the exemplar. The thickness of lines indicates the strength of the association, based on the numbers in Table 1.

Given the fact that infrequent exemplars tend to be lost, we might predict that the use of the full form in the pragmatic sense, which is already very unlikely, would eventually become nonexistent. In this way variable situations can be resolved toward a situation in which an innovative phonetic form has a specific sense. Of course, this is precisely what occurs in the process of grammaticization.

14. FREQUENCY EFFECTS: CATEGORY FORMATION. Continuing now with evidence that particular instances of constructions are stored in memory representations, I consider in this section and the next two other effects of frequency of particular exemplars of constructions. The first case concerns the nature of the category formed by the lexical items that are used in the open slot in constructions. Sometimes this slot is highly generalized, for example, taking all nouns or all verbs of the language. At other times, this slot is semantically constrained. In a study of the use of adjectives and other modifying expressions after certain verbs of 'becoming' in Spanish, Bybee and Eddington (2006) found evidence that high-frequency lexical instances of constructions can act as the central members of the category formed by members of the open slot in a construction. For two of the four verbs used in the study, the adjectives that were found with the particular verbs form an exemplar category with the most frequent member as the central member.

The study involved four Spanish verbs of 'becoming' used with human subjects and adjectives.

(15) quedarse + ADJECTIVE 'to become (lit. to remain + refl.)'
ponerse + ADJECTIVE 'to become (lit. to put oneself)'
hacerse + ADJECTIVE 'to become (lit. to make oneself)'
volverse + ADJECTIVE 'to become (lit. to turn oneself)'

The question addressed in many studies of these verbs in Spanish is how to determine which verb to use with a given adjective. Previous analyses have attempted to find general features that characterize the adjectives used with each verb (Crespo 1949, Fente 1970): for example, is the change fast or slow, is the subject passive or active, is the result permanent or temporary?

Eddington (1999) studied these verbs in a large corpus that included both spoken and written materials. His results show that the features proposed by other researchers fail to distinguish the corpus examples of *quedarse*, *ponerse*, and *volverse*, all of which tend to be used with changes that are fast, passive, and temporary.

Looking again at the distribution of verb + adjective combinations in the corpus, Bybee and Eddington find that certain verb + adjective combinations have a high token frequency and can therefore qualify as prefabs; for example, consider those, given in 16, with their token frequencies per approximately two million words.

(16) ponerse nervioso (17) 'to get nervous'
quedarse solo (28) 'to end up alone'
quedarse inmóvil (17) 'to be immobile'

For *quedarse* and *ponerse*, many other collocations were very similar to these semantically. For example, *quedarse inmóvil* occurred seventeen times in the corpus material (mostly in the written material), and its use as a prefab seems to have spawned many similar uses with other adjectives. In the corpus, there were fifteen other adjectives or modifying expressions with meanings similar to *inmóvil* that were used only one to three times. These adjectives form a category with prototype effects: the most frequent member is central and the other members are more marginal. Other members included adjectives that are basically synonymous with *inmóvil* such as *parado* 'stopped, standing'; expressions that are figurative/metaphorical such as *de piedra* 'of stone'; and those that share the 'motionless' feature but add other features, such as *atrapado* 'trapped'. Thus we argue for a category with the high-frequency member as the center of the category.

Rather than attempting to find abstract semantic features that characterize all the adjectives used with a particular verb, Bybee and Eddington propose that the verbs *quedarse* and *ponerse* each have a number of such clusters of adjectives. For example, central members of categories for *quedarse* besides the two mentioned above are the following, which are semantically related to *quedarse inmóvil*: *quedarse quieto* 'to become still', *quedarse tranquilo* 'to calm down', *quedarse callado* 'to quiet down, become silent', *quedarse dormido* 'to fall asleep', and two other categories that are unrelated, *quedarse sorprendido* 'to be surprised' and *quedarse embarazada* 'to get pregnant'. See Bybee & Eddington 2006 for further details.

Three types of evidence suggest that the most frequent member is central to the category. First, the larger, more productive categories (that is, those with the highest type frequency) are organized around a frequent member, suggesting that productive uses of the verb occur on the basis of reference to semantic similarity to a frequent member. The groups of adjectives that occurred with the verbs that were less productive did not have a high-frequency member. Of the four verbs studied, only two, *quedarse* and *ponerse*, showed categories organized around high-frequency exemplars. The other two verbs, which are much less frequent with animate subjects, had a much more scattered and miscellaneous distribution with adjectives.

Second, family resemblance structure uses the most frequent expression as central. For example, the chain in 17 takes *inmóvil* with its meaning of motionlessness as the link between the other two adjectives.

(17) petrificado — **inmóvil** — atrapado
'turned to stone' 'immobile' 'trapped'

Third, we conducted an experiment on the acceptability of verb + adjective combinations. We asked forty-eight peninsular Spanish speakers to rate the acceptability of sentences we took from the corpus. All stimuli were naturally occurring utterances of Spanish. The subjects were asked to rate the stimuli on a five-point scale from *perfectamente bien* 'perfectly fine' to *raro* 'strange/rare'. There were three groups of stimuli: (i) high-frequency phrases (*quedarse inmóvil*); (ii) low-frequency phrases with a close

semantic affinity to a high-frequency phrase (*quedarse parado*); and (iii) low-frequency phrases with no semantic connection to a high-frequency phrase (*quedarse orgullosísimo* 'become very proud'). The results for *quedarse* are shown in Figure 5.

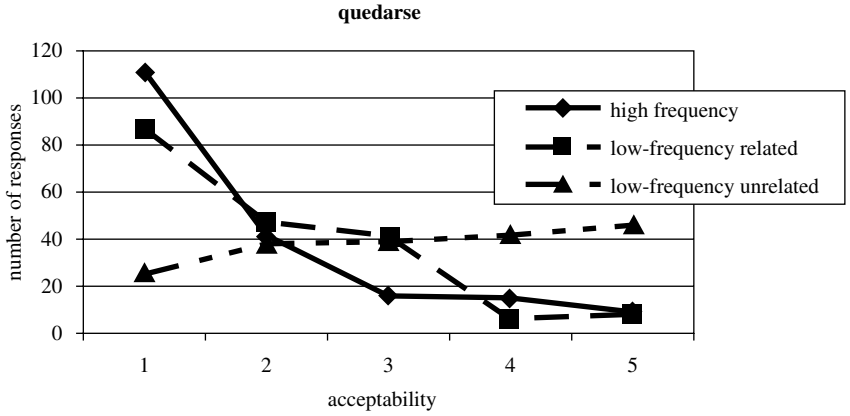

FIGURE 5. Acceptability judgments. '1' is high acceptability and '5' is low.

The results show that:

(i) The high-frequency phrases were judged most acceptable. ($\chi^2(1) = 51.4$, $p < 0.0001$)

(ii) A significant difference was found between the high-frequency phrases and the low-frequency phrases that were semantically similar to the high-frequency phrases. (For *quedarse* and *ponerse* together: $\chi^2(1) = 6.22$, $p < 0.013$.)

(iii) The strongest result was the significant difference between the low-frequency related items and the low-frequency unrelated items. ($\chi^2(1) = 32.9$, $p < 0.0001$)

Thus both frequency and semantic similarity to a frequent exemplar significantly influenced the subjects' judgments of acceptability. We can conclude that not only do speakers record specific exemplars of constructions in memory, but that frequency of use also has an impact on the strength of these exemplars and on category formation. A further conclusion is that acceptability judgments rely to some extent on familiarity: frequent word sequences and word sequences similar to frequent ones will be judged more acceptable than low-frequency, isolated combinations.

15. FREQUENCY EFFECTS: RESISTANCE TO CHANGE. Exemplars of morphosyntactic constructions, like morphologically complex words, are resistant to change if they are highly frequent. Just as irregular verbs that are of high frequency resist regularization, so also constructions with odd or irregular properties resist change in the particular exemplars that are of high frequency (see Ogura 1993, Bybee & Thompson 1997, Smith 2001).

Tottie (1991) studied the use of *not*-negation and *no*-negation (also called neg-incorporation) as in the examples in 18 and 19.

(18) He did not see anything. (*not*-negation)

(19) He saw nothing. (*no*-negation)

Diachronically, the usage with an incorporated negative occurred in Old English and therefore predates the construction with *not* by several centuries (Mossé 1952, Campbell 1959; see discussion in Tottie 1991). The more recently developed construction with

not is more productive and appears to be gradually increasing its usage. Thus we can predict that the *no*-negation construction would be maintained primarily in high-frequency constructions and collocations, while *not*-negation would be spreading to more contexts.

Tottie studied these two constructions in a large corpus of spoken and written British English. She extracted only those examples where the use of the alternate construction would have the same meaning and implications (as in 18 and 19). She found that certain constructions, especially existential *be* (as in 20), stative *have* (as in 21), and copular *be* (as in 22), have a higher use of *no*-negation than lexical verbs do, as shown in Table 2. This suggests that *no*-negation, rather than being an option for all sentences, has become associated with certain constructions.

(20) by the time they got to summer there was no more work to do
(21) the Fellowship had no funds
(22) as a nation we are not doing well enough. This is no new discovery

	SPOKEN		WRITTEN	
Existential *be*	34/38	89%	96/98	98%
Stative *have*	18/28	64%	41/42	98%
Copular *be*	12/20	60%	26/47	55%
Lexical verbs	20/76	26%	67/104	64%

TABLE 2. Proportion of *no*-negation (Tottie 1991).

These three constructions are fairly frequent, accounting together for more of the data than all of the lexical verbs combined. Their frequency could help explain the fact that they preserve the older construction; much like the old ablauting verbs of English (*break*, *broke*; *write*, *wrote*; etc.), their high frequency strengthens their representations and makes them less likely to be reformed on the more productive pattern. This suggests that a frequency effect might also be found among the lexical verbs.

In fact, certain frequent verbs, that is, *know*, *do*, *give*, and *make*, account for many of the examples of *no*-negation in the lexical examples.

(23) no, Marilyn does no teaching I imagine she's a research assistant
(24) I've done nothing except you know bring up a family since I left school
(25) I know nothing about his first wife

In addition, some lexical verbs occur in conventionalized expressions or prefabs that are mostly used in writing.

(26) the ballads make no mention of the trapping of rabbits
(27) Make no mistake about it, the divisions are very serious
(28) the split in the Conservative Party over Africa gives me no joy

These examples demonstrate that even after a construction has lost its productivity, specific exemplars of the construction may live on because they have accrued strength through repetition and so continue to be used.

16. CONCLUSION. The preceding discussion has presented a number of cases which argue, each one in a different way, for memory or cognitive storage of particular exemplars of constructions. This evidence includes the following facts:

(i) Speakers are familiar with certain word combinations (prefabs) which are in no way exceptional in meaning or form.
(ii) Special phonological reduction accrues to specific high-frequency phrases.
(iii) New constructions are created out of specific instances of old general constructions.

(iv) In grammaticization, changes in phonology, semantics, and structure occur in extremely high-frequency constructions.
(v) Certain higher-frequency exemplars of constructions dominate formation of categories of items within constructions.
(vi) High-frequency exemplars of constructions resist change on the basis of more productive constructions.

These facts all point to the conclusion that grammar is the cognitive organization of experience with language. Usage feeds into the creation of grammar just as much as grammar determines the shape of usage. Actual language use cannot be omitted from the study of grammar, because it constitutes a large part of the explanation for why languages have grammar and what form that grammar takes.

Grammar cannot be thought of as pure abstract structure that underlies language use: just as there can be no discrete separation of grammar and lexicon because there are so many cases in which specific lexical items go with and/or require certain grammatical structures, so also there can be no strict separation of grammar and usage. Grammar is built up from specific instances of use that marry lexical items with constructions; it is routinized and entrenched by repetition and schematized by the categorization of exemplars.

A conceptualization of grammar as pure structure fails to provide us with explanations for the nature of grammar. A theory based on usage, by contrast, which takes grammar to be the cognitive organization of language experience, can refer to general cognitive abilities: the importance of repetition in the entrenchment of neuromotor patterns, the use of similarity in categorization, and the construction of generalizations across similar patterns. These processes, combined with the functions of language in context, such as establishing reference, maintaining coherence, and signaling turn-taking, explain grammar as the ritualization of oft-repeated routines (Haiman 1994).

Language can be viewed as a complex system in which the processes that occur in individual usage events, such as those just mentioned, with high levels of repetition, not only lead to the establishment of a system within the individual, but also lead to the creation of grammar, its change, and its maintenance within a speech community.

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