2

LANGUAGE UNIVERSALS AND USAGE-BASED THEORY

JOAN BYBEE

2.1. Universals in a Theory of Language

The treatment of similarities and differences among languages has always been central to theorizing about language. As Givón (2002) points out, linguistic science has gone through cycles in which the similarity and diversity of languages are alternately emphasized. American structuralism worked with certain structural properties that could be described given a certain procedure (e.g., phones, phonemes, morphs, morphemes, etc.) but avoided claims about more substantive categories and encouraged researchers not to impose a European model on the world's languages (Sapir, 1921; Whorf, 1945). Martin Joos (1957, p. 96) writes that in the American tradition "languages could differ from each other without limit and in unpredictable ways." At that stage in the history of linguistics, the diversity in the world's languages was emphasized. This is one area in which Chomsky (1965) definitely broke with his predecessors: he situated language universals squarely within a linguistic theory and established the tradition that a linguistic theory is required to say something about universals.

Chomsky's (1965) theory links language universals to child language acquisition by claiming that the universal aspects of language are genetically determined, that is, innate in the child. The basic idea follows from Jakobson's (1941 [1968]) observation of similarities in children's acquisition of phonology across languages and preferred patterns of phoneme distribution across languages. The crucial link between child language and universals would presumably be language change: change in the grammar takes place in first language acquisition, and thereby universals become manifest in the language. However, language change is much less studied in the generative framework, so that an understanding of how this occurs has not been fully worked out (but see Lightfoot, 1979, 1991; Roberts & Roussou, 2003).

17

In contrast, the theory I will discuss here, usage-based theory, sees a very different relationship between language universals, language change, and child language. As a much more empirically based theory, the fact that there are actually very few synchronic universals of language in the strong sense, that is, features that all languages have in common, means that there is much less emphasis put on universals of grammar as *static constraints*.

The formulation and explanation of language universals within a usage-based framework is based on the theories implicit or explicit in the work of Joseph Greenberg (1969, 1978), taken up and elaborated by Givón (1979 and elsewhere) and other functionalists, such as Li (1975, 1976), Thompson (1988, 1998), and Croft (2001, 2003), just to name a few. The underlying idea is that languages conventionalize frequently used structures so that use directly shapes structure. If language is used in similar ways in different cultures, similar grammars will arise.

Given that a number of factors are involved in this process, a variety of outcomes is possible. Because the factors are local to the communicative situation and the repetition of these factors in real-time events leads to the creation of grammatical patterns, this view of language makes it qualify as a complex system (Holland, 1998). Thus, complexity theory applies directly to this view of language in which grammar is emergent. Language universals (in the weak sense of statistical tendencies) are also emergent rather than given a priori.

2.2. Features of Usage-Based Theory

It will not be possible to give a full account of usage-based theory here; instead, I will only mention some specific features relevant to language universals (but see Barlow & Kemmer, 2000; Bybee, 2001, 2006a, for discussion). In terms of grammatical description, usage-based theory takes constructions, which are direct form-meaning pairings, to be the basic units of grammar (Goldberg, 2006). Construction grammar and usage-based theory emphasize the specifics of grammar, grammar on a level that is not likely to be universal. For instance, the following sentences exemplifying constructions have been studied in construction grammar (Fillmore, Kay, & O'Connor, 1988; Israel, 1996).

(1) What's a nice girl like you doing in a place like this?
(2) The inmates dug their way out of the prison.
(3) The more he digs, the dirtier he gets.

In these cases, the specific construction determines the meaning of the expression. Of course, more generalized constructions have also been studied. Goldberg (1995,

2006) has been especially interested in the ditransitive construction (*Mary gave Jim a book*), and Croft (2001) has studied a wide range of general constructions across languages.

Construction grammar in a usage-based framework would also take account of the fact that certain instances of constructions are also conventionalized. Thus (1) is not just an example of the "what is X doing Y" construction, but also a conventionalized instance of it. Using an exemplar model, constructions as well as particular instances of constructions can be registered in memory (Bybee, 2006a). New findings in child language research show that children learn constructions by first mastering specific instances (with particular lexical items, such as the ditransitive with *give*) before going on to generalize and use the constructions productively with other lexical items (Lieven, Pine, & Baldwin, 1997; Tomasello, 2003).

Croft (2001) argues explicitly against the universality of constructions, maintaining instead that each language defines its own constructions and the categories within them. "Constructions are language specific, and there is an extraordinary range of structural diversity of constructions encoding similar functions across languages" (p. 183). Croft surveys the types of voice (active, passive, and inverse) constructions across languages and concludes (as have others) that there are no static synchronic universals of the expression of voice. There are, however, similarities that can be discovered and Croft, following the Greenbergian theory of universals, attributes these similarities to the diachronic paths of development for voice constructions. As in other areas of grammar, diachronic work has revealed a limited number of paths of change for voice constructions. Because change is gradual, constructions change their properties only very gradually, with the result that across languages, constructions in the same functional domain will have both similarities and differences.

Usage-based theory also emphasizes the effects of frequency of use on cognitive representations. One major effect of token frequency is the strengthening or entrenchment of structures (Bybee, 1985, 2006a; Langacker, 1987). With repetition, sequences of elements become automatized and are processed as a single unit. Thus, patterns that are repeated for communicative reasons can become automated and conventionalized as part of grammar (Givón, 1979) (see section 2.6). Other effects of frequency of use will be discussed below.

2.3. Situating Universals in a Linguistic Theory

A fundamental question for any linguistic theory to address is the nature of the human genetic endowment that makes language possible. There are various ways to approach this question. Perhaps the most fundamental consideration is whether

language similarities are to be attributed to domain-general or domain-specific processes and abilities. Domain-general abilities are those that are also used outside of language, in general cognition, and include categorization, use of symbols, use of inference, and so on. Domain-specific abilities would be those that are specific to language and not evidenced elsewhere. The ability to process speech auditorily may turn out to be quite specific to language and not a process used elsewhere. (See Chapter 7 for further discussion.)

Among the domain-specific abilities that have been proposed, one might distinguish between structural knowledge and processing abilities. The innate parameters of generative grammar would be structural knowledge—specific knowledge about how languages are structured. An example of a processing constraint that might be innate would be the parsing constraint discussed by Hawkins in Chapter 4). The structural knowledge would become manifest during the acquisition of language by children, but the processing constraint would affect choices of structures and thus influence grammar through usage.

Researchers have the right to make any sort of hypotheses they want; in effect, they can choose where they are going to look for universals. The most parsimonious of hypotheses would be that language is derived from general cognitive principles. Thus Lindblom, MacNeilage, and Studdert-Kennedy (1984, p. 187) urge us to "DERIVE LANGUAGE FROM NONLANGUAGE!" (emphasis in original). I agree that this should be the first line of attack, and we should hypothesize structures or abilities specific to language only when all other hypotheses fail.

A problem arises, however, in making the distinction between general cognitive tendencies and specifically linguistic ones. The main problem is that our conceptual framework for understanding our experience and the semantic packaging we use when talking about it are often difficult to distinguish. For instance, Jackendoff (2002) formulates a principle he calls Agent First, which expresses a strong tendency found in languages to put the agent of the verb in first position in the clause. He regards this principle as part of the Universal Grammar (UG) "tool kit." In contrast, Goldberg (2006) presents evidence that the salience of agents (actors) is a general cognitive bias; their salience would give rise to the tendency to mention them first. I do not know how to resolve this debate. Perhaps the best solution would be to give a rather strict definition for what would qualify as a linguistic universal and then search in general cognition for linguistic factors that manifest themselves only as tendencies. This leads to considerations of the next section.

2.4. How Universal Are Universals?

As mentioned above, serious work on crosslinguistic patterns turns up very few abso-
lute universals. As someone who has been very interested in language universals and
who has invested a great deal in empirical research trying to discover language uni-
versals, it is something of a disappointment to have to conclude that there are very
few absolute synchronic universals of language. As reported in my book, *Morphology*,
I surveyed the verbal morphology of 50 unrelated languages and found statistical
patterns of great interest, but very few absolute universals, in the sense that one
can say "all languages have x." One finding was that inflectional affixes on verbs
appeared in a certain order with respect to the verb stem: aspect is the closest, then
tense, and then mood; person-number affixes are farthest from the stem. There are
exceptions to this ordering, making this only a tendency. The only absolute universal
I found is that all languages have at least some derivational morphology.

A second study (Bybee, Perkins, & Pagliuca, 1994) was directed more at uncov-
ering universal patterns of change, for these seemed to be the foundation for the
synchronic tendencies discovered earlier. In this study we included both inflectional
and periphrastic expressions associated with verbs in 76 languages. The type of syn-
chronic universals that emerged was implicational: One can say, for instance, that
if a language has any inflectional morphology at all, it will have a past or a perfec-
tive inflection. If it lacks inflection, it is likely, instead, to have a periphrastic marker,
perfect or anterior (two names for the same thing). The diachronic paths of change
uncovered were much more striking. This study focused on diachronic relations
between lexical expressions and grammatical ones, and found a number of revealing
similarities across unrelated languages indicating strong universals in the way new
grammatical markers evolve. As Greenberg and Givón have noted, we here have facts
of great potential for helping us understand the common basis upon which grammar
evolves and a way of understanding the similarities among languages. (For further
discussion, see sections 6.2 and 6.3, Chapter 6).

The paucity of true universals of synchronic language structure poses a great
problem for the innateness theory. Crosslinguistic diversity leads to claims that these
universals are very abstract and are disguised by other traits of languages. Newmeyer
(2005) discusses the problems with trying to build typology and universals into a
theory of grammar and concludes that processing constraints will account for many
crosslinguistic patterns. Another approach is to propose a universal and innate "tool
kit" that contains the possible grammatical devices that can be used (Jackendoff,
2002). A problem with this approach, as I see it, is that there is no account of how
languages "pick and choose" from this tool kit the devices they use. This proposal

needs a diachronic component before it can be evaluated. In the next section we consider how universal tendencies might emerge in specific languages.

2.5. How Do Universals Manifest Themselves?

As we have mentioned, in Chomskian theory universals emerge in child language acquisition. In two senses this approach has not been fully articulated. First, despite some similarities between preferred patterns in the languages of the world and in early child language, strict correspondences have been hard to locate, whether phonological, morphological, or syntactic. Indeed, trying to locate language universals empirically is not a major part of the generative research agenda. Instead, innate universals are taken as given, so any feature demonstrated to be present in a few languages can be considered universal. (See Newmeyer, 2005, for a discussion of the problems with this approach.)

Second, the actual link between child language and the properties of languages across the world has not been established. What is needed is an account of how children change language in such a way as to make the universals manifest. Although many writers assume that the child language acquisition process changes language (Halle, 1962; Kiparsky, 1968; Lightfoot, 1979; and many others both earlier and later; see Janda, 2001, for references), empirical evidence that this is actually the case is still lacking. Indeed, the few studies that compare language change with child language come up with as many differences as similarities. In phonology, Drachman (1978) and Vihman (1980) compare phonological alterations common in child language to sound changes found in the languages of the world and find great dissimilarities. For instance, whereas consonant harmony is common in child language (that is, a child tends to use the same consonant twice in a word, e.g., *dadi* for *doggie*), consonant harmony does not occur in the (adult) languages of the world. Rather, vowel harmony occurs in many languages, but not in child language. Hooper (1979) and Bybee and Slobin (1982) find both similarities and differences between the acquisition of morphology and morphological change. On the one hand, Hooper finds that children do learn basic or unmarked forms first and use them to make more complex forms, which mirrors some analogical changes. On the other hand, Bybee and Slobin report that some formations produced by young children are not continued by older children and adults. Slobin (1997) also argues that the semantic/pragmatic senses, such as epistemic meanings, produced by the grammaticization process are not available to young children. If child language acquisition were the vehicle for language change, one would expect a much closer correspondence between the formations caused by the two. In addition, sociolinguistic studies find that ongoing changes are most advanced in adolescents and preadolescents

rather than in children in the midst of the acquisition process (Labov, 1982). (See Croft, 2000, for further discussion.)

Research in the usage-based framework finds that crosslinguistic tendencies are manifested as language is used, and can be identified in actual instances of language use and language change. Through repetition of the patterns that manifest these tendencies, conventionalized structures are created. Section 2.6 will be devoted to explaining what we know about how this occurs. But first, let us consider some of the correspondences between child language and language universals.

The implicational universals of Jakobson and Greenberg are of special interest here because they seem to show a correspondence between child language and universals. In Chapter 3, Hurford, based on Jakobson (1941 [1968]), poses the hypothesis, "Given a universal: 'If a language has X, it always has Y,' then X cannot be acquired unless Y has been acquired first" as a way of stating the relation between child language and universals. Hurford proposes that the development of language in children recapitulates the development of languages over time. He does not suggest that children mold language toward universals except in the very long run.

The first problem with moving directly from Jakobson's or Greenberg's implicational universals to child language is that there are many different types of relations stated as implications. For instance, the statement that if a language has nasal vowels it also has oral vowels ties together two phenomena that are related to one another: as we will see below, nasal vowels develop out of oral vowels. In contrast, the statement that if a language has person/number marked on the verb it will also have tense, aspect, or modality marked on the verb (Greenberg, 1963) relates categories of different types. One does not develop out of the other, but, rather, the two types of categories have different relations to the verb such that it is much more likely for tense, aspect, and modality to be marked on the verb than person/number. The statement that the presence of inflection in a language implies the presence of derivational morphemes also relates two phenomena that do not have a developmental relation to one another. There are only a very small number of cases in which it might be hypothesized that inflection became derivation and vice versa; in fact, derivation and inflection do not interact particularly in languages. Indeed, this statement is rather vacuous given that all languages have some derivational morphology. One could even say that if a language has nasal vowels, it has derivational morphology.

A second problem is that child language does not progress by the child learning all of one category before moving on to the next. Thus, it is difficult to know what exactly is meant by "acquisition" (see below). The third problem involves the relation between some of these implications and frequency. As Greenberg

(1966) has shown, unmarked categories (in phonology, morphology, and lexicon) are more frequent than marked ones in the languages in which they both occur. Thus, if children acquire unmarked categories earlier than marked ones, how do we know that it is not frequency in the input that determines the order of acquisition?

Let us consider some examples of implication universals to see what type of explanation they are amenable to. First, a phonological example: The following general statement about the distribution of oral and nasal vowels in the languages of the world seems to be true: The presence of nasal vowel phonemes in a language implies the existence of oral vowel phonemes. As predicted, it also appears to be true that children acquire some oral vowels before they acquire any nasal vowels, for instance, in French (Aicart-de Falco & Vion, 1987; Lalevée & Vilain, 2006). But when we consider how languages acquire nasal vowels, we see that it is in a completely different way than the way children acquire them. Nasal vowels develop from assimilation to a nasal consonant and subsequent loss of that consonant (Ferguson, 1963). Thus English words such as *camp*, *think*, and *went* have nasalized vowels owing to the presence of a following nasal consonant. Also, in English this nasal consonant is becoming shorter before a voiceless stop and may eventually disappear. When that happens, English will have phonemic nasal vowels. Because nasal vowels develop out of oral vowels, but only in certain contexts, in any language that has nasal vowels, they occur in fewer positions and thus less frequently than the oral ones (Ferguson, 1963). When children are acquiring vowels, they first use only oral vowels and substitute oral vowels for nasal ones. They do not develop the nasality only in the context of a nasal consonant. It is plausible that children learn oral vowels earlier because they are auditorily and articulatorily less complex, and they are also more frequent. So the relation between child language and language universals is actually quite indirect in this example.

Now consider the morphological tendency concerning tense, aspect, and mood versus person/number. To simplify the discussion, let us just consider aspect in relation to person/number agreement. In *Morphology: A Study of the Relation between Meaning and Form* (1985), I argued that aspectual meaning is more relevant to the meaning of the verb than person/number agreement because aspect modifies the perspective from which the situation described by the verb is viewed (Comrie, 1976). My argument is that because of the semantic affinity of aspect to the verb, markers of aspect that are grammaticalizing would be highly likely to fuse with the verb and form an affix (see the discussion in section 2.6). Personal pronouns can also reduce and fuse with the verb to form agreement inflections, but this is somewhat less likely because of the lower semantic relevance of person/number agreement to the inherent meaning of the verb. Thus, whereas aspectual markers can change a verb from meaning "to know" to mean "to find out" (e.g., the Spanish perfective forms of *saber*,

"to know," mean "to find out"), or can change the role of the situation described by the verb from ongoing to bounded, person/number agreement just indicates whether the arguments are first, second, or third person, and singular or plural. These latter indicators leave the meaning of the verb intact.

Aspect seems to be acquired before person/number, but some important qualifications are necessary. Children do not acquire the aspectual system in its entirety before moving on to person/number agreement. They may start with some aspectual marking at early stages, but before the entire system is mastered, person/number agreement has already begun to develop. In addition, the first aspectual markings only occur on certain verbs; children do not at first use the same verb with two different aspects (Bloom, Lifter, & Hafitz, 1980; Tomasello, 1992), suggesting that their use is not fully productive until later. Still, let us say that children begin to use some aspectual marking before they use person/number marking (see Simoes & Stoel-Gammon, 1979, for Brazilian Portuguese). Why would this be? Probably for the same reason that aspectual markers fuse with verbs in diachronic change— aspect has a direct effect on the verb's meaning. Thus, at first children are not separating out the aspectual meaning from the verb meaning. *Fell* and *spilled* are punctual actions with results, whereas *playing* and *talking* are continuing activities. It is also important that in adult language use certain verbs also favor certain aspects as well (Stefanowitsch & Gries, 2003). Part of the motivation for the early pairing of certain verbs with certain aspects may be in the input. In any case, at least one of the same factors is involved in both child language and language change. Yet, we will see in section 2.6 that this does not necessarily mean that children are the main vehicle by which aspectual affixes develop.

Is the fact that languages readily develop aspectual markers on verbs and children readily acquire them an indication of an innate linguistic universal, or is it based on a more general universal of human cognition? Again, this question is very difficult to answer. It is possible that the innate linguistic abilities of children predispose them to look for a specific marker of aspect; it is also possible that the general cognitive makeup of human beings directs us to conceptualize events or situations in such a way that notions such as the completion or continuation of a situation are important to our thinking and interactions.

These examples show that the relations between stated universals of language, language change, and child language development are not simple relations and do not provide clear evidence for innate universals. We must always bear in mind that crosslinguistic generalizations such as the implicational laws just discussed are generalizations over many cases in different languages, but the more explanatory factors have to be sought by examining the nature of the relation and how these relations arise (Bybee, 1988). In the next section we will see how patterns of change

that arise through language use can help us understand these generalizations across languages.

2.6. How Can Universals Derive from Usage?

2.6.1. Conventionalization

Languages are conventional, meaning that a community of speakers agrees upon the form-meaning correspondences of words and the patterns they occur in. The fact that *perro* in Spanish refers to approximately the same entities as *dog* in English is by convention. Similarly, the fact that the possessive phrase *Mary's dog* puts the possessor first and uses a clitic to mark possession, and Spanish *el perro de María* puts the possessor second and uses a preposition are conventions of the two languages. Even if these two ways of signaling possession are selected from a universal inventory or "tool kit," they still have to be conventionalized to enter a language and remain there.

Conventions can be established by fiat, as when someone names a baby or a pet or decides to call their new invention a *radio*. But none of this works unless other people also adopt the convention. In addition, a few rounds of repetition are necessary to lock the convention in place. Grammatical structures are also conventionalized, but they do not arise in the conscious manner in which naming takes place. They arise, instead, by the repetition of patterns or sequences of items that have proved useful within the context of conversational exchange.

The effects of repetition are interesting to consider. Haiman (1994, 1998) makes the point that repeated use leads to the development of linguistic patterns in a way that is parallel to the process of ritualization, which occurs with nonlinguistic patterns. Ritual gestures start out as functional, but as they are repeated and transmitted across generations, they undergo certain changes. For one thing, they become "emancipated" from their original function. Saluting as used in the military began in the Middle Ages when soldiers wore metal armor; when they greeted a fellow soldier, they lifted the faceplate to identify themselves as friendly. This originally functional act came to stand for a respectful greeting of a fellow soldier or officer; it became emancipated from its original function, and continues to be used even though metal armor is no longer worn. Because emancipation can also occur in the creation of grammatical structure, the direct functional motivation for these structures will not always still be operative synchronically.

Haiman also notes that repeated use leads to automation of the rituals and reduction in their form; again the salute is a good example. We will see below that in the process of grammaticalization, emancipation, automation, and reduction in form, all play an important role.

2.6.2. Grammaticalization Defined and Illustrated

The most pervasive process by which grammatical items and structures are created is the process of grammaticalization. Grammaticalization is usually defined as the process by which a lexical item or a sequence of items becomes a grammatical morpheme, changing its distribution and function in the process (Heine, Claudi, & Hünnemeyer, 1991; Heine & Reh, 1984; Hopper & Traugott, 1993; Lehmann, 1982 [1995]; Meillet, 1912). Thus English *going to* (with a finite form of *be*) becomes the intention/future marker, *gonna*. However, more recently it has been observed that it is important to add that grammaticalization of lexical items takes place within PARTICULAR CONSTRUCTIONS and, further, that grammaticalization creates new constructions (Bybee, 2003; Traugott, 2003). Thus, *going to* does not grammaticalize in the construction exemplified by *I'm going to the store* but only in the construction in which a verb follows *to*, as in *I'm going to help you*. The term is also used at times to include cases of change that do not involve specific morphemes, such as the creation of a grammatical word order pattern out of a commonly used discourse pattern.

Historical linguists have long been aware of grammaticalization as a way to create new grammatical morphemes, but it was research in the 1980s and 1990s that revealed the pervasiveness of grammaticalization. Crosslinguistic and historical documentation make it clear that grammaticalization is going on in all languages at all times and, further, that all aspects of grammar are affected. In addition, there is the further remarkable fact that across unrelated languages lexical items with very similar meanings enter into the process and give rise to grammatical morphemes with very similar meanings (Bybee et al., 1994; Bybee, 2006b). Consider these examples (and see Heine & Kuteva, 2002, for a wonderful catalog of such changes):

In many European languages, an indefinite article has developed out of the numeral "one": English *a/an*, German *ein*, French *un/une*, Spanish *un/una*, and Modern Greek *ena*. Although these are all Indo-European languages, in each case this development occurred after these languages had differentiated from one another and speakers were no longer in contact. Furthermore, the numeral "one" is used as an indefinite article in Moré, a Gur language of the Burkina Faso (Heine & Kuteva, 2002), in colloquial Hebrew (Semitic), and in the Dravidian languages Tamil and Kannada (Heine, 1997). Examples of demonstratives becoming definite articles are also common: English *that* became *the*; Latin *ille*, *illa* "that" became French definite articles *le*, *la* and Spanish *el*, *la*; in Vai (a Mande language of Liberia and Sierra Leone), the demonstrative *me* "this" became a suffixed definite article (Heine & Kuteva, 2002).

The English future auxiliary *will* came from an Old English verb meaning "to want." Parallel to this, a verb meaning "want" became a future marker in Bulgarian,

Rumanian, and Serbo-Croatian, as well as in the Bantu languages of Africa—Mabiha, Omyene, and Swahili (Bybee & Pagliuca, 1987; Heine & Kuteva, 2002). Parallel to English *can* from "to know," Baluchi (Indo-Iranian), Danish (Germanic), Motu (Papua Austronesian), Mwera (Bantu), and Nung (Tibeto-Burman) use a verb meaning "know" for the expression of ability (Bybee et al., 1994). Tok Pisin, a creole language of New Guinea, uses *kæn* (from English *can*) for *ability*, and also *savi* from the Portuguese *save*, "he knows," for ability. Latin *potere or *possum*, "to be able," gives French *pouvoir* and Spanish *poder*, both meaning "can" as auxiliaries and "power" as nouns. These words parallel English *may* (and past tense *might*), which earlier meant, "have the physical power to do something." Verbs or phrases indicating movement toward a goal (comparable to English *be going to*) frequently become future markers around the world not only in languages such as French and Spanish, but also in languages spoken in Africa, the Americas, Asia, and the Pacific (Bybee & Pagliuca, 1987; Bybee et al., 1994).

Of course, not all grammaticalization paths can be illustrated with English examples. There are also common developments that do not happen to occur in English. For instance, a completive or perfect marker meaning "have [just] done" develops from a verb meaning "finish" in Bantu languages, as well as in languages as diverse as Cocama and Tucano (both Andean-Equatorial), Koho (Mon-Khmer), Buli (Malayo-Polynesian), Tem and Engenni (both Niger-Congo), Lao (Kam-Tai), Haka and Lahu (Tibeto-Burman), Cantonese, and Tok Pisin (Bybee et al., 1994; Heine & Reh, 1984). In addition, the same development from the verb "finish" has been recorded for American Sign Language, showing that grammaticalization takes place in sign languages the same way as it does in spoken languages (Janzen, 1995).

For several of these developments I have cited the creole language, Tok Pisin, a variety of Melanesian Pidgin English, which is now the official language of Papua New Guinea. Pidgin languages are originally trade or plantation languages, which develop in situations where speakers of several different languages must interact though they share no common language. At first, pidgins have no grammatical constructions or categories, but as they are used in wider contexts and by more people more often, they begin to develop grammar. Once such languages come to be used by children as their first language, and thus are designated as creole languages, the development of grammar flowers even more. The fact that the grammars of pidgin and creole languages are very similar in form, even among pidgins that developed in geographically distant places by speakers of diverse languages, has been taken by Bickerton (1981) to be strong evidence for innate language universals. However, studies of the way in which grammar develops in such languages reveals that the process is the same as the grammaticalization process in more established languages

(Romaine, 1995; Sankoff, 1990). Tok Pisin in particular has had a long life as a second language before becoming the first language of a generation of children, and even while it was still a pidgin language has developed grammatical markers, such as *bai* for future from the English phrase *by and by*.

2.6.3. How Grammaticalization Occurs

The grammaticalization process occurs during language use. A number of factors come into play, and these factors have been discussed in the literature cited above. For present purposes, let us think of grammaticalization, as Haiman does (1994, 1998), as a process of ritualization. This allows us to think of it in domain-general terms. We have already noted that ritualization requires repetition. In fact, one of the changes that occurs in grammaticalization is an extreme increase in frequency of use of the grammaticalizing construction. Besides being one the factors that changes, frequency itself is an important catalyst in many of the other changes that occur.

Like other repeated instances of behavior, grammaticalizing sequences reduce phonetically. I have already mentioned *going to* reducing to *gonna*. We also have ongoing reduction in phrases such as *want to*, *have to*, *supposed to*. Looking back to the past, we find that English *-ed* is the reduction of *dyde*, "did"; Spanish first person singular future suffix *-é* is the reduced form of the Latin auxiliary *habeo*. Such reduction is due to the automatization of the phonetic gestures in these sequences; as these strings are repeated, they become more fluent with more overlap and reduction of gestures.

Automatization also leads to sequences of morphemes being processed as units (Boyland, 1996). The internal units of the grammaticalizing expression become less transparently analyzable and more independent of other instances of the same units. Thus *have* in *have to* becomes more distant from the *have* in another grammatical expression, the Perfect. The forms of *have* in the Perfect contract with the subject (*I've seen, he's taken*, etc.), but the forms of *have* in *have to* do not (**I've to go*). Of course, this is driven in part by the semantic changes that occur.

Semantic change occurs gradually and involves various types of change. On the one hand, components of meaning appear to be lost. Thus *gonna* no longer indicates movement in space; *will* no longer indicates "wanting to"; *can* no longer means "know" or "know how to," but only ability or possibility; *a/an* is still singular, but does not explicitly specify "one." This type of change has been called "bleaching." It comes about as these expressions increase the contexts in which they are used. Even though *can* still indicates the subject has the knowledge to tell truthfully in *I can tell you that she has gone with her uncle*, it does not indicate anything at all about knowledge in *walk as quietly as you can*.

However, not all semantic change involves loss of meaning (Traugott, 1989). In change by pragmatic inference, meanings that are frequently implied by the accompanying context are conventionalized as part of the meaning of the expression. Frequent contexts of use for *be going to*, such as *I am going to deliver this letter*, imply intention, and as a result intention to act has become an important part of the meaning of the *be going to* expression.

In this short sketch, I have identified several mechanisms of change, all of which are driven by increased usage: phonetic reduction, automatization, increasing autonomy, semantic bleaching, and pragmatic inference. These are the basic mechanisms of change that can act on any grammaticalizing material and render it part of the grammar. These same processes are at work in very common grammaticalizations, such as the *go* futures, and also in the rarer ones, such as futures from temporal adverbs (such as Tok Pisin *bai*). Although these processes explain similarities across languages, they also allow for and create differences: a future from *go* will have different semantic nuances than a future from *want*; a future that has recently grammaticalized will have a strong intention reading, whereas a future that has undergone more development may have no intention uses at all (Bybee et al., 1994). Thus, grammaticalization has great potential for explaining the similarities as well as the differences among languages.

2.6.4. *Grammatical Properties Arising from Language Use in Interaction*

Thompson and colleagues have explored a number of constructions as used in natural conversation with an eye toward explaining their crosslinguistic properties in terms of the interactions in which they occur. Let us consider as our example the crosslinguistic analysis of interrogation in Thompson (1998). Thompson explores interrogation and negation together as being somewhat comparable in that they have been analyzed as expressing clause-level operators, and all languages provide some means for asking questions and expressing negation. She finds that the crosslinguistic properties of questions, especially as compared to negatives, result from of the way they are used in conversation.

Crosslinguistically there are five strategies for marking interrogatives (Ultan, 1978):

a. Intonation changes from declarative utterances
b. Interrogative morphemes that occur at or very near the beginning of the utterance or at the end
c. Tag questions following a statement
d. Nonintonational phonological marking at the end of the utterance
e. Inversion of the verb with the first element in the utterance

Thompson (1998, p. 313) points out that all of these strategies "involve special marking either at the beginning or end of the clause/sentence/utterance, or involve prosodic patterns that characterize the entire clause/sentence/utterance." She goes on to consider the nature of the unit over which the interrogation strategy operates, noting that many descriptions use the term *utterance* because units smaller than a clause (such as a noun phrase) can be questioned. In the cases where better data is available, it is clear that the locus of operation for the interrogation marker is a prosodic unit such as the intonation unit. In contrast, sentence negation always involves a particle, affix, or special word that is positioned with respect to the predicate rather than a prosodic unit or utterance.

Thompson sees these special properties of the grammar of interrogation to be linked to the way questions occur in conversation. Questions seek information, and in natural conversation they typically occur as the first part of an adjacency pair (Schegloff, 1968; Schegloff & Sacks, 1973). The first part of a pair establishes the nature of what follows; if a question is posed, conversational conventions require that a new turn (from a different speaker) follow, and this turn should be relevant to the information sought by the question.

A major factor in turn, transition in conversation, is the prosodic structure of the utterance. Thus the grammatical marking of interrogation develops out of conversational pairings in which the prosodic unit is modified by strategies that elicit a response from the hearer. As mentioned above, these include modification of the prosodic or intonation unit itself, adding something to it at the beginning or end, or modifying the beginning or end. When such strategies are repeated, they become conventionalized and part of the grammar.

To continue the comparison with negation, negative clauses do not occur in conversation as parts of adjacency pairs with any frequency. Negative sentences can deny propositions internal to the conversation or completely external to it. They can offer new information, or they can remark on old information. Thus, their grammar does not reflect any turn-taking markers.

2.6.5. The Development of Discourse Markers

It appears likely that all grammatical structures arise from use in conversation, including the various structures discussed in section 2.6.2. Particularly clear examples are discourse markers. Discourse markers are not universal, but the way they develop is, according to Traugott and Dasher (2002). Discourse markers such as *indeed, in fact, actually,* and comparable markers in other languages start out with concrete semantic content and function as part of the propositional meaning of the clause. The original meanings of the three English adverbs mentioned just above are still clear to native speakers. *Indeed* came from Old English *in dede*, meaning "in

action," as in the expression, "in word and in deed." As Traugott and Dasher explain, actions are observable, and the common inference is made that what is seen is true. Thus *in dede* came to be used to express "in actuality," as in this example from 1388:

(4)   ofte in storial mateer scripture rehersith the commune opynyoun of men, and affirmith not, that it was so *in dede*.
"often where matters of history are concerned, scripture repeats men's common opinion, but does not affirm that it was so in actuality."

<div align="right">(c. 1388 Purvey, Wycliffe, p. 56)</div>

As a further development, *in dede* takes on an epistemic function, meaning "in truth," as in the following example from 1452:

(5)   The men of βe town had suspecion to hem, βat her tydyngis were lyes (as it was in dede), risen.
"The men of the town, being suspicious that their reports were lies (as was certainly true), rose"

<div align="right">(1452, Chronical Capgrave, p. 216)</div>

In this example, *in dede* has scope over the whole clause "that their reports were lies" and comments on its truth, thereby making an epistemic evaluation.

From this epistemic function, *indeed* developed several discourse-related functions, by which it came to express the relations among clauses, as the speaker intends them. One of these was an adversative function, which contrasts the assertion with *indeed* with the previous assertion:

(6)   [teachers] sometime purposely suffering ["allowing"] the more noble children to vainquysshe, and, as it were, gyuying ["giving"] to them place and soueraintie, thoughe *in dede* the inferiour children haue more lernyng.

<div align="right">(1531, Elyot, p. 21)</div>

Another such function, commonly used today, is additive:

(7)   any a one that is not well, comes farre and neere in hope to be made well: *indeed* I did heare that it had done much good, and that it hath a rare operation to expell or kill diuers maladies.

<div align="right">(1630 Taylor, Penniless Pilgrimage, p. 131C1)</div>

The adversative and additive functions, then, have scope over entire clauses, and serve to express the relation between assertions.

Traugott and Dasher review the development of a number of such discourse adverbs in English and Japanese, and make the following generalization (see also Company Company, 2006, for comparable examples and analysis of Spanish discourse markers): The functional development is from verb modifier to clause modifier, from scope within the clause to scope over the whole clause, from relatively

concrete senses to more abstract and nonreferential senses, and from contentful function to procedural function, which expresses the speaker's attitudes to the content of the discourse and the participants in it. These paths of development can be considered universals, because changes always follow the directions cited here and not the reverse. Note, however, that no synchronic universals of language result. These examples, along with the other examples of grammaticalization cited earlier, demonstrate that searching only for universals of synchronic structure is far too limiting.

What we learn from these examples is that when people use language, they are interested in much more than the content that the speaker has made explicit; as people converse, they are constantly making inferences about the speaker's attitude toward the truth of his/her statements, about the intentions of the speaker, and about relations the speaker is proposing among clauses. This online process of inferencing imbues words and constructions with meanings they may not have originally had, but note, meanings of certain restricted types. For this reason, Traugott and Dasher are able to state generalizations about the directions of change.

2.6.6. Processing Preferences

Another way that language use can give rise to certain kinds of structures is by the repetition of structures that are easier to process at the expense of structures that are more difficult to process. Hawkins (2004; Chapter 4) proposes the Performance-Grammar Correspondence Hypothesis: "Grammars have conventionalized syntactic structures in proportion to their degree of preference in performance, as evidenced by patterns of selection in corpora and by ease of processing in psycholinguistic experiments."

One of the processing preferences that Hawkins discusses is evident in the following two sentences:

(8)   The man waited for his son in the cold but not unpleasant wind.
(9)   The man waited in the cold but not unpleasant wind for his son.

In languages such as English, sentences with the longer phrase at the end (8) occur more often than those with the longer phrase internal to the clause (9). Hawkins argues that sentences of the type (8) are preferred because they allow all the constituents to be identified earlier than the type in (9), where the long phrase defers the second PP. So, this case constitutes another way in which actual language use feeds into grammar.

We might want to go even further than Hawkins in explaining how sentence structure arises. Hawkins assumes the existence of constituent structure as a universal, but does not comment on where it might come from. In Bybee (2002) I argue

that constituent structure is also emergent from language use in that words that are commonly used together come to be processed together. As mentioned earlier, a well-known feature of neuromotor processing is that sequences of actions that are often used become processed as single units (Boyland, 1996). Words within constituents occur together more often than words across constituent boundaries; thus the constituents themselves can be conventionalized patterns based on language use. Because words within constituents are related semantically to one another, the starting point for this explanation is a strong tendency to put semantically related items together in an utterance. Then, with repetition and conventionalization, constituents will emerge.

2.7. Conclusion: Similarities and Differences

As noted earlier, the basic structure of the usage-based approach to universals is first articulated in Greenberg (1969). Greenberg identifies several "dynamic selective tendencies," or diachronic processes, that create language states. He says (1969, p. 186),

> Synchronic regularities are merely the consequences of such forces. It is not so much again that "exceptions" are explained historically, but that the true regularity is contained in the dynamic principles themselves.

This theory, then, aims to explain both the similarities and the differences among languages. Rather than having one source for similarities (universals) and one source for language-specific properties, all grammatical patterns are created by the same set of processes, whether the patterns are highly common or very rare. It is in this sense, then, that the universals underlying the structure of language are to be found in the processes that govern the way speakers choose structures online and the processes that are set in motion by repetition of the same patterns over and over again. Some of these processes are likely to be domain-general processes, as argued here. I propose (with many others) that we look first to domain-general processes before turning to language-specific processes. It should be borne in mind that the processes that create grammar in the languages of the world interact in complex ways; online processing, conversational interactions, repetition leading to conventionalization, and language acquisition will all play a role in our final understanding of the general and specific properties of human languages.

Key Further Readings

Croft (2003) is an introduction to the Greenbergian approach to typology and universals with an emphasis on morphosyntax. Some of the original works by

Greenberg are accessible and certainly worth reading. Greenberg (1963) contains the proposals for word order universals as well as a number of implicational universals of morphology. Greenberg (1966) demonstrates the importance of frequency of use in understanding the properties of marked and unmarked members of categories.

In phonology, Blevins (2004) presents her "evolutionary" approach to crosslinguistic distributional patterns, which she demonstrates to be based on diachronic universals. Bybee (2008) demonstrates that a structural tendency of languages (Structure Preservation), which results in only contrastive features being used in lexical alternations, can be explained by the convergence of several well-attested paths of diachronic change.

It is interesting also to read more about grammaticalization (also called grammaticization) in a crosslinguistic context. Bybee et al. (1994) is a study of the grammaticalization of tense, aspect, and modality in a sample of 76 unrelated languages. Heine and Kuteva (2002) compile from myriad sources across languages all the documented paths of change that create grammatical morphemes. This is a wonderful reference and work, and a fun book to browse in. John Haiman's 1994 article and 1998 book are both highly readable and extremely thought provoking; they examine the role of repetition in rituals and in language.

References

Aicart-de Falco, S., & Vion, M. (1987). La mise en place du système phonologique du francais chez les enfants entre 3 et 6 ans: Une étude de production. *Cahiers de psychologie cognitive, 3*, 247–266.

Barlow, M., & Kemmer, S. (Eds.). (2000). *Usage-based models of language*. Stanford: CSLI.

Bickerton, D. (1981). *Roots of language*. Ann Arbor: Karoma.

Blevins, J. (2004). *Evolutionary phonology: The emergence of sound patterns*. Cambridge: Cambridge University Press.

Bloom, L., Lifter, K., & Hafitz, J. (1980). The semantics of verbs and the development of verb inflections in child language. *Language, 56*, 386–412.

Boyland, J. T. (1996). *Morphosyntactic change in progress: A psycholinguistic approach*. Dissertation: University of California at Berkeley.

Bybee, J. L. (1985). *Morphology: A study of the relation between meaning and form*. Philadelphia: John Benjamins.

Bybee, J. L. (1988). The diachronic dimension in explanation. In J. A. Hawkins (Ed.), *Explaining language universals* (pp. 350–379). New York: Basil Blackwell.

Bybee, J. L. (2001). *Phonology and language use*. Cambridge: Cambridge University Press.

Bybee, J. L. (2002). Sequentiality as the basis of constituent structure. In T. Givón & B. F. Malle (Eds.), *The evolution of language out of pre-language* (pp. 109–132). Amsterdam: John Benjamins. Reprinted in Bybee (2007), pp. 313–335.

Bybee, J. L. (2003). Mechanisms of change in grammaticization: The role of frequency. In R. Janda & B. Joseph (Eds.), *Handbook of historical linguistics* (pp. 602–623). Oxford: Blackwell. Reprinted in Bybee (2007), pp. 336–357.

Bybee, J. L. (2006a). From usage to grammar: The mind's response to repetition. *Language, 82,* 529–551.

Bybee, J. L. (2006b). Language change and universals. In R. Mairal & J. Gil (Eds.), *Linguistic universals* (pp. 179–194). Cambridge: Cambridge University Press.

Bybee, J. L. (2007). *Frequency of use and the organization of language.* Oxford: Oxford University Press.

Bybee, J. L. (2008). Formal universals as emergent phenomena: The origins of structure preservation. In J. Good (Ed.), *Language universals and language change* (pp. 108–121). Oxford: Oxford University Press.

Bybee, J. L., & Pagliuca, W. (1987). The evolution of future meaning. In A. Giacalone Ramat, O. Carruba, & G. Bernini (Eds.), *Papers from the VIIth International Conference on Historical Linguistics* (pp. 109–122). Amsterdam: John Benjamins.

Bybee, J. L., Perkins, R., & Pagliuca, W. (1994). *The evolution of grammar: Tense, aspect, and modality in the languages of the world.* Chicago: University of Chicago Press.

Bybee, J. L., & Slobin, D. I. (1982). Why small children cannot change language on their own: Evidence from the English past tense. In A. Alqvist (Ed.), *Papers from the Fifth International Conference on Historical Linguistics* (pp. 29–37). Amsterdam: John Benjamins.

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

Company Company, C. (2006). Subjectification of verbs into discourse markers: Semantic-pragmatic change only? In B. Cornillie & N. Delbecque (Eds.), *Topics in subjectification and modalization* (pp. 97–121). Amsterdam: John Benjamins.

Comrie, B. (1976). *Aspect.* Cambridge: Cambridge University Press.

Croft, W. (2000). *Explaining language change: An evolutionary approach.* Harlow, England: Longman Linguistics Library.

Croft, W. (2001). *Radical construction grammar: Syntactic theory in typological perspective.* Oxford: Oxford University Press.

Croft, W. (2003). *Typology and universals* (2nd ed.). Cambridge: Cambridge University Press.

Drachman, G. (1978). Child language and language change: A conjecture and some refutations. In J. Fisiak (Ed.), *Recent development in historical phonology* (pp. 123–144). The Hague: Mouton.

Ferguson, C. A. (1963). Assumptions about nasals: A sample study in phonological universals. In J. H. Greenberg (Ed.), *Universals of language* (pp. 53–60). Cambridge, MA: MIT Press.

Fillmore, C. J., Kay, P., & O'Connor, M. C. (1988). Regularity and idiomaticity in grammatical constructions. *Language, 64,* 501–538.

Givón, T. (1979). *On understanding grammar.* New York: Academic Press.

Givón, T. (2002). *Bio-linguistics: The Santa Barbara lectures.* Amsterdam: John Benjamins.

Goldberg, A. E. (1995). *Constructions: A construction grammar approach to argument structure.* Chicago: University of Chicago Press.

Goldberg, A. E. (2006). *Constructions at work*: *The nature of generalization in language*. Oxford: Oxford University Press.

Greenberg, J. H. (1963). Some universals of grammar with particular reference to the order of meaningful elements. In J. H. Greenberg (Ed.), *Universals of language* (pp. 73–113). Cambridge, MA: MIT Press.

Greenberg, J. H. (1966). *Language universals*: *With special reference to feature hierarchies*. The Hague: Mouton.

Greenberg, J. H. (1969). Some methods of dynamic comparison in linguistics. In J. Puhvel (Ed.), *Substance and structure of language* (pp. 147–203). Berkeley: University of California Press.

Greenberg, J. H. (1978). Diachrony, synchrony and language universals. In J. H. Greenberg, C. A. Ferguson, & E. Moravcsik (Eds.), *Universals of human language, Vol. 1*: *Method and theory* (pp. 61–92). Stanford: Stanford University Press.

Haiman, J. (1994). Ritualization and the development of language. In W. Pagliuca (Ed.), *Perspectives on grammaticalization* (pp. 3–28). Amsterdam: John Benjamins.

Haiman, J. (1998). *Talk is cheap*. Oxford: Oxford University Press.

Halle, M. (1962). Phonology in generative grammar. *Word, 18*, 54–72.

Hawkins, J. A. (2004). *Efficiency and complexity in grammars*. Oxford: Oxford University Press.

Heine, B. (1997). *Cognitive foundations of grammar*. New York: Oxford University Press.

Heine, B., Claudi, U., & Hünnemeyer, F. (1991). *Grammaticalization: A conceptual framework*. Chicago: University of Chicago Press.

Heine, B., & Kuteva, T. (2002). *World lexicon of grammaticalization*. Cambridge: Cambridge University Press.

Heine, B., & Reh, M. (1984). *Grammaticalization and reanalysis in African languages*. Hamburg: Helmut Buske Verlag.

Holland, J. H. (1998). *Emergence: From chaos to order*. New York: Basic Books.

Hooper, J. B. (1979). Child morphology and morphophonemic change. *Linguistics, 17*, 21–50.

Hopper, P., & Traugott, E. C. (1993). *Grammaticalization*. Cambridge: Cambridge University Press.

Israel, M. (1996). The way constructions grow. In A. E. Goldberg (Ed.), *Conceptual structure, discourse and language* (pp. 217–230). Stanford: CSLI Publications.

Jackendoff, R. (2002). *Foundations of language: Brain, meaning, grammar, evolution*. Oxford: Oxford University Press.

Jakobson, R. (1941 [1968]). *Child language, aphasia, and phonological universals*. The Hague: Mouton.

Janda, R. D. (2001). Beyond "pathways" and "unidirectionality": On the discontinuity of language transmission and the counterability of grammaticalization. In L. Campbell (Ed.), *Grammaticalization: A critical assessment*. Special issue of *Language Sciences, 23*(2–3), 265–340.

Janzen, T. (1995). The polygrammaticalization of FINISH in ASL. Masters' Thesis, University of Manitoba.

Joos, M. (1957). *Readings in linguistics I*. Chicago and London: University of Chicago Press.

Kiparsky, P. (1968). Linguistic universals and linguistic change. In E. Bach & R. Harms (Eds.), *Universals in linguistic theory* (pp. 171–202). New York: Holt, Rinehart and Winston.

Labov, W. (1982). Building on empirical foundations. In W. P. Lehmann & Y. Malkiel (Eds.), *Perspectives on historical linguistics* (pp. 17–92). Amsterdam: John Benjamins.

Lalevée, C., & Vilain, A. (2006). What does it take to make a first word? The development of speech motor control during the first year of life. In H. C. Yehia, D. Demolin, & R. Laboissiere (Eds.), *Proceedings of the 7th International Seminar on Speech Production* (pp. 83–90). Belo Horizonte, Brazil: Centro de Estudos da Fala, Acústica, Linguagem e Música.

Langacker, R. W. (1987). *Foundations of cognitive grammar, Volume 1: Theoretical prerequisites*. Stanford: Stanford University Press.

Lehmann, C. (1982 [1995]). *Thoughts on grammaticalization*. Munich: Lincom Europa.

Li, C. N. (Ed.). (1975). *Word order and word order change*. Austin: University of Texas Press.

Li, C. N. (Ed.). (1976). *Subject and topic*. New York: Academic Press.

Lieven, E. V., Pine, J. M., & Baldwin, G. (1997). Lexically based learning and early grammatical development. *Journal of Child Language, 24,* 187–219.

Lightfoot, D. (1979). *Principles of diachronic syntax*. Cambridge: Cambridge University Press.

Lightfoot, D. (1991). *How to set parameters: Arguments from language change*. Cambridge, MA: MIT Press.

Lindblom, B., MacNeilage, P., & Studdert-Kennedy, M. (1984). Self-organizing processes and the explanation of phonological universals. In B. Butterworth, B. Comrie, & Ö. Dahl (Eds.), *Explanations for language universals* (pp. 181–203). New York: Mouton.

Meillet, A. (1912). L'évolution des formes grammaticales. *Scientia* 12. Reprinted in A. Meillet, *Linguistique Historique et Linguistique Générale* (pp. 130–148). Paris: Edouard Champion, 1948.

Newmeyer, F. J. (2005). *Possible and probable languages*. Oxford: Oxford University Press.

Roberts, I., & Roussou, A. (2003). *Syntactic change: A Minimalist approach to grammaticalization*. Cambridge: Cambridge University Press.

Romaine, S. (1995). The grammaticalization of irrealis in Tok Pisin. In J. L. Bybee & S. Fleischman (Eds.), *Modality in grammar and discourse* (pp. 389–427). Amsterdam: John Benjamins.

Sankoff, G. (1990). The grammaticalization of tense and aspect in Tok Pisin and Sranan. *Language Variation and Change, 2,* 295–312.

Sapir, E. (1921). *Language: An introduction to the study of speech*. New York: Harcourt, Brace and World.

Schegloff, E. (1968). Sequencing in conversational openings. *American Anthropologist, 70*(6), 1075–1095.

Schegloff, E., & Sacks, H. (1973). Opening up closings. *Semiotica, 7,* 289–327.

Simões, M. C. P., & Stoel-Gammon, C. (1979). The acquisition of inflections in Portuguese: A study of the development of person markers on verbs. *Journal of Child Language, 6*(1), 53–67.

Slobin, D. I. (1997). The origins of grammaticizable notions: Beyond the individual mind. In D. I. Slobin (Ed.), *The crosslinguistic study of language acquisition, Vol. 5: Expanding the contexts* (pp. 1–39). Mahwah, NJ: Lawrence Erlbaum.

Stefanowitsch, A., & Gries, S. T. (2003). Collostructions: Investigating the interaction of words and constructions. *International Journal of Corpus Linguistics, 8*(2), 209–243.

Thompson, S. A. (1988). A discourse approach to the crosslinguistic category "adjective." In J. A. Hawkins (Ed.), *Explaining language universals* (pp. 167–185). Oxford: Basil Blackwell.

Thompson, S. A. (1998). A discourse explanation for the crosslinguistic differences in the grammar of interrogation and negation. In A. Siewierska & J. J. Song (Eds.), *Case, typology and grammar* (pp. 309–341). Amsterdam: John Benjamins.

Tomasello, M. (1992). *First verbs: A case study of early grammatical development.* Cambridge: Cambridge University Press.

Tomasello, M. (2003). *Constructing a language.* Cambridge, MA: Harvard University Press.

Traugott, E. C. (1989). On the rise of epistemic meanings in English: An example of subjectification in semantic change. *Language, 65*, 31–55.

Traugott, E. C. (2003). Constructions in grammaticalization. In R. Janda & B. Joseph (Eds.), *Handbook of historical linguistics* (pp. 624–647). Oxford: Blackwell.

Traugott, E. C., & Dasher, R. B. (2002). *Regularity in semantic change.* Cambridge: Cambridge University Press.

Ultan, R. (1978). Some general characteristics of interrogative systems. In J. H. Greenberg, C. A. Ferguson and E. Moravcsik (Ed.), *Universals of human language, Vol. 4: Syntax* (pp. 211–248). Stanford, CA: Stanford University Press.

Vihman, M. (1980). Sound change and child language. In E. C. Traugott, R. Labrum, & S. Shepherd (Eds.), *Papers from the Fourth International Conference on Historical Linguistics* (pp. 303–320). Amsterdam: John Benjamins.

Whorf, B. L. (1945). Grammatical categories. *Language, 21*, 1–11.