

## Cross-linguistic comparison and the development of grammatical meaning

The prime methodology in historical linguistics is the comparison of languages and dialects with close genetic relations.\* We propose in this paper to use the comparison of genetically and areally unrelated languages in the study of universals of semantic change, in particular semantic change that leads to the development of grammatical meaning. In this paper we propose a characterization of the notion of semantic generalization in grammatical meaning for certain aspectual and modality categories. We show that certain correlations between the degree of formal grammaticization and semantic generalization can be found in a large sample of unrelated languages. Finally, we outline briefly a theory of semantic change that accounts for the development of lexical material into grammatical material, illustrating with the example of obligation and future markers that develop from verbs of possession.

Most of the data used to test the hypotheses discussed in this paper are taken from a stratified probability sample of 50 genetically and areally unrelated languages representative of the languages of the world (Perkins 1980). Since the sample is relatively free of genetic and areal bias, it is possible to make inferences concerning the relative frequency of grammatical phenomena, inferences that are not possible with samples chosen for convenience. For earlier work (Bybee 1983, 1985) these languages were studied for their bound, inflectional verbal morphology. For the present work, we have also studied the non-bound grammatical markers of modality in a second, smaller set of languages.

### 1. Inflectional aspect

It is often observed that grammatical meaning develops out of lexical meaning by a process of generalization or weakening of

semantic content (Givón 1973, Fleischman 1982, and many others). It can be further hypothesized that the continued development of grammatical meaning is likewise by a process of generalization, and moreover that this semantic change is paralleled over a long period of time by phonetic erosion. Thus we would expect to find a certain correlation between the degree of semantic generalization of a grammatical morpheme and its degree of phonological reduction and fusion with other items (in the cases to be examined here, these other items are always verb stems), so that a morpheme with a highly generalized meaning will exhibit greater phonological reduction and fusion than a morpheme with a more specific meaning.

This hypothesis is only testable in cases where the notion of "generalized" meaning can be characterized explicitly. One way of establishing that one morpheme is more general than another is to show that the first covers all the functions of the second plus a further set of functions. In the realm of aspect, for example, there are in the languages of the world verbal inflections that might be labelled as continuous, habitual, and imperfective. In Comrie's 1976 analysis of aspect, continuous and habitual are treated as subdivisions of the imperfective. If a language has a marker for continuous, it will be used to describe situations that are ongoing at some temporal reference point. The habitual in such a language will be used to describe situations that are customary or repeated regularly. In contrast, a language that has an imperfective marker will use that marker to describe both situations that are continuous or ongoing, and those that are habitual or customary. We can say, then, that an imperfective morpheme is more general in meaning than either a continuous or habitual morpheme.

Given this semantic relationship between imperfective, habitual and continuous, and the hypothesis that grammatical meaning tends to generalize over time, we can predict that either continuous or habitual morphemes (or both) might develop into imperfective morphemes. Indeed, Comrie 1976 cites cases where a morpheme or construction that was originally restricted to the progressive<sup>1</sup> or continuous has changed its function to also include the habitual and has thus generalized to an imperfective. For instance, a Scots Gaelic construction using an originally locative preposition and a verbal noun at one time signalled only progressive aspect, but now "has replaced the other verbal forms, apart from those with perfective meaning, i. e. has become an Imperfective" (Comrie 1976: 100). Thus the sentence *tha e a' seinn* means either "he is

singing” or “he sings”. A similar change has apparently occurred in Welsh. Comrie also cites the extension of a progressive or continuous to habitual contexts in Yoruba and Igbo. Marchese 1979 describes a similar extension in Kuwaa, a language of the Kru family. These changes can all be characterized as generalizations, since the morphemes in question acquire a wider range of use.<sup>2</sup>

If the imperfective is more general — covers a wider span of meaning — than either the habitual or the continuous, and further, if the continuous can develop into an imperfective, then we would expect to find differences between the formal expression of imperfective versus the other two more specific meanings, differences that show the imperfective to have a higher degree of grammaticization. In our survey of inflectional morphology in fifty languages, we found that this was indeed the case. Two indicators of degree of grammaticization may be cited.

The first is simple frequency of occurrence as an inflectional morpheme. While languages may employ various means of expressing aspectual notions, the more specific notions tend to be expressed by full lexical items (such as *begin* / *continue* / *be accustomed to talking*, and so forth), while more general meanings will have grammaticized expression, either auxiliary constructions, such as English *be talking*, or verbal inflections. Among grammaticized expression, those that are inflectional show the highest degree of development because they are bound to the verb (so that no open class items may intervene between the morpheme in question and the verb).<sup>3</sup> Thus we would expect that among meanings expressed by inflections, the most general meanings would be the most common. In the survey of verbal morphology in fifty languages, it was found that while perfective, imperfective, habitual and continuous are commonly expressed inflectionally, more specific meanings rarely occur.<sup>4</sup> Among these inflectional markers, we find a heavy bias towards the more general meaning of imperfective over the more specific habitual and continuous. In the sample, fourteen languages have a general marker of imperfective that contrasts with a perfective: Basque, Burushaski, Georgian, Iatmul, Kiwai, Logbara, Nahuatl, Pawnee, Sierra Miwok, Senoi, Serbian, Touareg, Yanomama, and Yukaghir. In half that number of languages, an inflectional continuous contrasts with an habitual: Kiwai, Maasai, Nahuatl, Pawnee, Sierra Miwok, Tarascan, and Zapotec. Thus the more general meaning is twice as frequent as an inflection than the more specific one.

A further generalization may be made in the form of an implicational statement, as so often used by Jakobson and Greenberg. We have seen that imperfective, continuous, and habitual all occur as inflections, and that either the more specific continuous or the more general imperfective may occur in an auxiliary construction (cf. the Scots Gaelic example above). We can add that it is possible for a language that has a general imperfective as an inflection to also have a progressive or continuous expressed in an auxiliary constructions, as in Spanish, which has a progressive *estar* + Present Participle construction along with an inflectional Preterite/Imperfect contrast (as does Iatmul, a language of the sample). However, the converse situation, we predict, will not occur: that is a situation in which the more specific meaning is coded as an inflection, while the more general one occurs in a non-bound construction. Thus, the occurrence of an inflectional continuous or habitual morpheme in a language implies an inflectional imperfective, or no imperfective at all. This hypothesis has not been tested on our language sample, because to date we have only studied bound markers of aspect.

A second indicator of degree of grammaticization is the degree of fusion of a morpheme with the verb stem. Even among inflectional markers there are differences in the degree of fusion of stem and affix. The longer an affix has been attached to a stem, the more likely it is that phonetic processes of fusion and reduction will have affected the stem. If the perfective/imperfective distinction is at a more advanced stage of development than the habitual/continuous distinction, then markers of the former distinction should condition changes in the verb stem more often than markers of the latter. In our survey, we found that this was indeed true: stem changes conditioned by the perfective/imperfective distinction were found in Burushaski, Kiwai, Nahuatl, Pawnee, Sierra Miwok, Senoi, Serbian and Touareg. On the other hand, Sierra Miwok is the only language in the sample in which stem changes were conditioned by habitual or continuous markers. An implicational statement derivable here is that stem changes conditioned by habitual or continuous markers imply the existence of stem changes conditioned by perfective/imperfective markers.

These facts suggest a unidirectional relationship between more and less general meanings, such that the more general meaning is historically derived from, and shows more signs of formal grammaticization than, the less general meaning. This example was

chosen because it provides an instance of an explicit cross-linguistic characterization of the concept of generalization of meaning: if a morpheme may be used to express both habitualness and continuousness, then it is more general than a morpheme that is restricted to one or the other. The notion of generalization, it should be noted, is twofold. On the one hand, a more general morpheme has a more general distribution, since it can be used in more contexts, and on the other hand, it is more general in that it lacks certain specific features of meaning. A morpheme that signals continuousness very specifically signals that the situation continues or was continuing uninterrupted at some period of time. For such a morpheme to generalize to cover habitual meaning, it must lose the specific notion of temporal continuity, and retain only a notion of a temporal stretch whose boundaries are irrelevant to the utterance. Thus by generalization we do mean to imply that meanings are emptied of their specificities. However, this is not the whole story, and in section 6 we will return to a fuller discussion of the mechanisms of semantic change involved in grammaticization.

## 2. The expression of modality

We now turn to the results of a survey of modality notions expressed in non-bound constructions in some twenty-five languages<sup>5</sup>. We will consider here the modality notions that are most frequently expressed in non-bound constructions — ability, obligation, intention, desire, possibility/probability and prediction or future. These constructions are usually, but not always, classifiable as auxiliary verb constructions in that the auxiliaries have some of the properties of main verbs or show an etymological relation to a main verb. In our survey, only elements that showed some signs of grammaticization that distinguished them from main verbs were included.

We have divided these modality notions into two groups. In one group are the modalities that predicate conditions of either an internal or external nature on a willful agent: these are the notions of ability, obligation, desire and intention. We will refer to these notions as *agent-oriented modalities*.<sup>6</sup> The second group contains the notions of possibility, probability and prediction or future. These notions do not specifically predicate anything concerning the agent or subject, but rather have the whole proposition in their

scope and express the speaker's evaluation of the truth or potential truth of the proposition contained in the utterance. We will refer to this group of modalities as *epistemic* modalities. Examples of these types of modalities, together with a list of languages in which they occur in non-bound expression follows.

A grammatical element signalling ability has the reading of either physical or mental ability, as in the reading of English *can* in *Carol can read cuneiform*.<sup>7</sup> Non-bound grammatical elements signalling ability are found in English, Haitian, Maasai, Mandarin, Palaung and Thai.

Often it is possible to distinguish strong and weak obligation, as in the following English examples: *Everyone must / has to pay taxes* (strong obligation), and *Everyone should contribute to the campaign fund* (weak obligation) (Horn 1972, Steele 1975, Lyons 1977, Coates 1983). For present purposes, however, the two degrees of obligation will be treated together. Languages with non-bound markers of obligation are Ainu, Basque, Cambodian (Khmer), Diegueño, English, Georgian, Haitian, Kiwai, Maasai, Mandarin, and Palaung.

The agent-oriented modality of desire should be kept distinct from a volitional mood, which expresses the speaker's desires, as in *Would that he were here*. The English phrase *want to* or *wanna* expresses desiderative modality: *They wanna take their share and go*. Non-bound grammatical elements expressing desire are found in Ainu, Haitian, Iatmul, and Navaho.

Less frequent perhaps are non-bound markers of intention. The English equivalent is the intention reading of the *gonna* construction, which is easiest to illustrate in the past tense: *He was gonna give it to me, but he forgot*. Markers of intention in non-bound expression are found in Cambodian (Khmer), Car, English, and Haitian.

The epistemic modalities do not appear to be quite as frequent in non-bound constructions as the agent-oriented modalities. We found auxiliary constructions for future or prediction, as in the English *The exhibit will open on Thursday*, in Ainu, Mandarin, Thai and Serbian. However, we also found future expressed in combination with a sense of probability in non-bound constructions in Kiwai and Ainu. A notion of probability not restricted to the future is expressed in non-bound constructions in English (*It may rain, it may have rained*), Palaung, and in Ainu, with a different form from the two mentioned above. Possibility and probability are both covered by the same non-bound marker in Luiseño, Navaho and Georgian.

It is well known that a single modal in English may have both an agent-oriented and an epistemic reading (Horn 1972, Lyons 1977, Coates 1983). Furthermore, Steele 1975 has noted both deontic and epistemic uses (such as those illustrated in the following sentences) for markers of obligation and permission in a variety of languages:

1. *The students may check books out of the library at any time.* (permission)
2. *The storm may clear by tomorrow.* (possibility)
3. *The students should bring a notebook.* (obligation)
4. *The storm should clear by tomorrow.* (probability)

The difference between the deontic and epistemic uses of *may* and *should* above is that the deontic use predicates certain conditions on a willful agent, whereas the epistemic use does not require a willful agent, rather, the modal has the whole proposition in its scope, and qualifies the extent to which the speaker is asserting the proposition to be true. In the corpus of spoken and written British English examined in Coates 1983, she found epistemic readings for all the modals of obligation — *must*, *should*, *ought*, *have got to*, and *have to* — although epistemic readings for the last two were very rare. The existence of both agent-oriented and epistemic readings for modals is not restricted to deontic modalities, however, since other modalities display a very similar double use.<sup>8</sup> Thus, ability markers are often used to express possibility. Compare English:

5. *Carol can read cuneiform.* (ability)
6. *I think there's a place where I can get a cheap kettle.* (possibility)

Such double use of markers of ability also occurs in Basque, Haitian, Khmer and Luiseño. Note that the difference between the two readings is very similar to the difference noted above for obligation and permission: the ability reading requires an active or animate agent, the possibility reading does not. The ability reading attributes an internal condition to that agent, while the possibility reading states that general conditions are such that the proposition is true, but no particular internal qualities are attributed to the subject.<sup>9</sup> *Could* has an ability sense in the past tense (*Claire could skate better than anyone*), as well as its epistemic reading, and *may* and *might*, though no longer used in an ability sense, were formerly used in this way.

Intention is an agent-oriented notion that is related to future, which is the epistemic modality of prediction. The English phrase

*be going to* is used to express the subject's intention, as in (7), or to express the speaker's prediction, as in (8):

7. *I'm going to paint the garage as soon as the weather is warm enough.*
8. *That cup of coffee's going to spill if you aren't careful.*

The same non-bound marker may be used for intention and future in Haitian, Spanish, French and several Kru dialects. In all of these cases, the marker is historically derived from the verb "to go".

Markers of desire or volition on the part of the subject have as their epistemic function the speaker's prediction or future tense. The English future auxiliary *will* developed out a verb signalling the subject's desire or volition. This use can still be seen in certain specialized contexts, such as questions and negatives:

9. *Will you go to a movie with me?*
10. *She will not set foot in that house.*

In these sentences, *will* does not have a sense of prediction, but rather of volition or willingness. This is perhaps a somewhat weaker notion of volition than that found in the main verb *want*, but it is not prediction. A more transparent overlap in function is found in Serbian, where the future auxiliary is a reduced form of the main verb "to want" *ht(j)eti*.

### 3. The evolution of modality

The preceding examples are intended to illustrate the dual function of modals as markers of both agent-oriented and epistemic modality. All of the historical evidence available on the semantic development of modals points to the unidirectional evolution of agent-oriented modalities into epistemic modalities. Indeed, we are hypothesizing that the opposite direction of development is not possible. The reasoning behind this hypothesis will be developed in the next section. For now, we will briefly review some of the historical evidence.

The English modal *must* was used in the sense of obligation in the earliest written documents, but only took on the epistemic sense of inferred or presumed certainty in the 17th century, according to the OED. Similarly, *should* is the past tense of *shall*, which meant "to owe" in the earliest records, and *ought* is the past tense of *owe*.



The epistemic uses of these modals are also later developments.<sup>10</sup> As we mentioned before, the more recently developed phrases indicating obligation — *have to* and *have got to* — are used epistemically only very rarely, according to Coates 1983; their principal use is to express strong obligation. *Shall* was also originally a modal of strong obligation, but it has now developed into an epistemic marker of prediction or future, and retains its use as a modal of obligation only in official language (Coates 1983). The Romance *haber* + infinitive future (Fleischman 1982), the Ukrainian formed with “have” (Ard n. d.), and some futures in Kru dialects (Marchese 1979) probably followed a similar development.

Using English examples again, we find that the modals *can* and *could*, which earlier were restricted to mental ability, and *may* and *might*, which referred to physical ability or power, all develop into markers of possibility (see above). Similarly, the Haitian form *cap*, which signals both ability and possibility, has developed from the French *capable*, “able”.

Morphemes indicating desire develop into markers of future in English, where *will* earlier meant “to want”; in other Germanic languages; in Serbian; and in Sierra Miwok, where morphological desideratives have developed immediate future readings. Ultan 1978 further cites Old Church Slavic, Modern Greek, Rumanian, Arabic, Somali, and Tagalog as having future auxiliaries that developed from verbs meaning “to want”.

#### 4. Semantic generalization

As the historical record indicates, the common trend is for agent-oriented modalities to develop epistemic meaning. This particular step in the development of modals (whose longer history we will discuss in section 6) can be seen as a semantic generalization parallel to that discussed earlier in connection with aspect. If a morpheme covers both agent-oriented and epistemic uses, it is necessarily more general in applicability than a morpheme limited to agent-oriented functions. When a morpheme changes in this way, it will necessarily lose some of the contextual restrictions on its occurrence. The agent-oriented modalities are restricted to occurring in sentences in which the subject is animate and willful, but this restriction is lost when epistemic uses develop.

We can further argue that the epistemic meaning is itself more general than the agent-oriented meaning, and that the continued development of morphemes into purely epistemic modals is a further generalization of the meaning.<sup>11</sup> First, note that agent-oriented modals attribute certain conditions to an agent, whereas epistemic modals have the whole proposition in their scope. This scope difference constitutes a difference in generality of meaning. We would not propose that any morpheme that has wide scope is more general than any morpheme with narrower scope. Rather, we propose that if two morphemes share a significant number of semantic features but differ in scope, then the one with wider scope has the more general meaning. Again, this generality will correspond to a larger number of contexts in which the morpheme can be used.

Second, note that the evolution of a morpheme into an epistemic modal from an agent-oriented modal necessarily involves the loss of certain specificities in its meaning, in particular, the specific conditions it attributes to the agent. Consider, for example, the evolution of a marker of ability into a marker of possibility. Modals such as *may* or *can* formerly expressed certain physical or mental attributes of an animate subject, attributes which allow the completion of the activity described by the main verb. The development of root possibility involves the loss of the restriction that these be physical or mental conditions, and encompasses any sort of conditions, such as social conditions, to be included in the allowing conditions (hence the permission reading). It further involves the loss of the restriction that these conditions be attributed to a willful agent, and allows the modal to develop the sense of allowing conditions even where a willful agent is not involved. In each step some specificities in the original semantic content are being reduced. The same sort of analysis is applicable to other agent-oriented modalities.

## 5. Semantic generalization as a universal

Although the evolution from one type of modality to another is gradual, and the steps must be outlined in detail (see section 6), on a very gross level – looking at arbitrary starting points and endpoints – we can say that agent-oriented modalities have more specific meaning than the corresponding epistemic modalities. If this direction of semantic development is universal, and further, if

this gradual semantic evolution is paralleled by a phonological evolution in which markers of modality gradually become reduced and fused with the verb (if other conditions are right), then we are able to explain a very peculiar fact about the cross-linguistic distribution of modality markers: While it is very common for agent-oriented modalities to be expressed by non-bound auxiliary or particle constructions, it is extremely rare to find agent-oriented modalities expressed by verbal inflection. Instead, inflectionally-marked modalities are almost always epistemic. We can demonstrate this with the data from our cross-linguistic survey.

As mentioned above, we have studied approximately twenty-five languages for their non-bound markers of modality. In addition, we have studied the 50 languages in the Perkins sample for their inflectional markers of modality or mood. The results show a striking correspondence between meaning and mode of expression. In the 25-language sample, we found five languages (listed in section 2) in which a non-bound marker signalled ability; in several cases the same marker signalled possibility. However, in the 50-language sample, there are no examples of an inflectional marker of ability, and only one example (Malayalam) of a bound marker that covers ability along with the more general notion of possibility.

A similar comparison can be made in the case of obligation, which occurs very frequently as a non-bound grammatical marker. In section 2 we listed the eleven languages of the 25-language sample with non-bound obligation markers. In the 50-language sample, however, only one case of an inflectional marker of obligation appeared (Tiwi).<sup>12</sup> We know of another case from outside the sample – the Turkish Necessitative, which marks an obligation on the part of the speaker.

Non-bound markers of desire are found in five languages of the 25-language sample, but only one language in the 50-sample (Sierra Miwok) has a bound desiderative marker of any generality, and this is also used as a marker of immediate future. Non-bound markers of intention occur in four languages (listed in section 2), but inflectional markers of intention occur only in Pawnee and Garo, and in both cases, these markers are also used as general future markers.

The rarity of agent-oriented modalities in inflection is in striking contrast to the frequency of epistemic modalities in inflection. As epistemic inflections we count inflections that occur freely in main clauses, and whose function it is to indicate the extent to which the

speaker is committing himself to an assertion. We exclude here inflections that are more common in subordinate clauses, that is, we are not counting subjunctives, or very specialized inflections such as conditionals, although their inclusion might be legitimate since the main clause epistemics we are interested in probably develop into subjunctives and hypotheticals (cf. English *would* and *should*). Inflections which indicate that there is only a possibility that the main proposition is true are found in eleven languages: Acoma, Diegueño, Garo, Kiwai, Korean, Malayalam, Ojibwa, Pawnee, Tarascan, Yukaghir and Zapotec; these are usually labeled "dubitative", "potential" or "suppositional". Thus 22% of the sample exhibits inflection for epistemic possibility. Given that the sample contains a number of languages with very little or no inflection, and that the most frequent inflectional distinction marked in the languages of the world — the indicative/imperative — is marked in only 48% of them, inflectional markers of epistemic possibility cannot be considered infrequent. It should also be borne in mind that the inflections that are counted as epistemics of possibility do not all have the same range of functions. What they have in common is that their major use is to signal epistemic possibility.

Inflectional markers of prediction — markers that have as their primary function the expression of the speaker's prediction that the event described in the proposition will take place in the future — are even more common. In the 50-language sample, 22, or 44%, have inflectional markers of future. This figure is just under that for imperatives, given above, which means that future inflections are extremely frequent. They are even more frequent in the sample than past inflections, which occur in 38% of the languages. This high frequency of futures should be emphasized in view of the expectations of linguists who suppose futures to be secondary compared to other tenses<sup>13</sup> and in view of the conclusions of Ultan 1978, who, operating with a large but biased (unrepresentative) cross-linguistic sample, states that futures are less often bound than other tenses. In fact, in our sample there are seven languages that have a future inflection but no past/present distinction expressed inflectionally.

To summarize the facts again, epistemic modalities are frequently expressed inflectionally, agent-oriented modalities only rarely. These facts can be predicted by the general hypothesis that agent-oriented modalities tend to develop into epistemic modalities. The result is that agent-oriented modalities do not usually occur in inflection,

which is the extreme form of grammaticization. We do not claim that there is a "constraint" against the occurrence of agent-oriented modalities as inflection — indeed, such inflections are possible, a point we will return to shortly. Rather, we claim that they will be rare, because during the time it takes for a morpheme to become reduced and fused to the verb, its meaning will have generalized so much as to have lost its agent-oriented properties.<sup>14</sup>

It is interesting to consider briefly those languages that do have agent-oriented modalities expressed as inflections: Tiwi and Turkish with obligation marked, Malayalam with ability and possibility, Pawnee and Garo with intention, and Sierra Miwok with desire. All of these languages have a large number of inflectionally-marked categories. Turkish and Garo are similar in that they are agglutinative languages in which a large number of morphemes may be rather loosely strung together. Tiwi and Pawnee are polysynthetic or incorporating languages in which it is quite common to have more than one lexical root per word. In all of these languages it is common to have a great deal of information packaged in a single word. Only Malayalam seems different. In this language, a verb is not likely to have multiple suffixes. However, it seems that the verbal suffixes in Malayalam are all relatively new, the verbal origin of the modal suffixes often being transparent. If different language types undergo fusion at different rates, then it is possible for some languages to have less general inflections than others. That would mean that languages with less general inflections will be those that have a large number of inflectional categories.

## 6. The development of grammatical meaning

In the preceding discussion we have given an explicit characterization of relative generality of meaning, and we have argued that increased generality of meaning corresponds to increased formal grammaticization. To this point, we have compared meaning only in widely-separated stages of development. We have not specified the mechanism of change involved in semantic generalization, nor have we considered how grammatical meaning develops out of lexical material. Although we cannot present a complete theory of grammaticization, in this section we would like to sketch the development of a verb of possession, such as *have*, into a marker

of obligation, and the further development of obligation markers into markers of prediction.

A period of lexical development precedes the onset of grammaticization, for a verb such as *have* is not suitable for grammatical uses unless it has already become sufficiently abstract and generalized. So we must begin our study with a main verb that has a concrete, physical denotation. *Have* originally meant “to hold in hand” according to the OED. The stages of the progressive generalization of this very active, concrete and specific meaning may roughly be set out as follows.

- a. “to hold in one’s hand” >
- b. “to have in one’s immediate personal possession (physically present)” >
- c. “to have or own as a possession (not physically present)” >
- d. “to have as an abstract possession, such as time, an idea, an education, a debt.”

The verb *to have* has generalized to cover all of these senses of “having” or “possessing”. The specific physical meaning has been lost, as demonstrated by the fact that if one wants to signal the more specific meanings, the verb *have* alone is insufficient — to specifically indicate meanings (a) or (b) one must add “in hand” or “with one”.

How does the generalization of lexical meaning take place? We propose that one of the important mechanisms in generalization is metaphorical extension. A concrete lexical item is recruited to express a more abstract concept, and while its use at first is understood as metaphorical, with continued use in abstract functions it is itself taken to encompass the abstract meaning. The more concrete meaning suffers as the uses of *have* that do not mean “in hand” become more frequent. Eventually, one no longer associates this specific semantic element with the verb. In this way, the specific and concrete semantic elements originally associated with the verb empty out, eventually leaving an extremely frequent and very general verb that is used for a large number of functions. We believe that this emptying of lexical content is a prerequisite to grammaticization because grammatical functions in themselves are necessarily abstract. It is no accident that in language after language one finds that the verbs used in auxiliary constructions are always verbs that had otherwise been of very frequent and general use.

So far we have only discussed *have* as a verb with a noun phrase object, proposing that this object is originally a concrete noun, but that gradually the use of *have* is extended to include abstract nouns. From abstract nouns another extension is possible — to objects that are verbal infinitives. This is also a metaphorical extension, but it differs from those leading to the emptying of semantic content, because at this point a new meaning is created. It is not *have* in itself that takes on a new meaning, but rather the whole construction — *have* plus an infinitive. The infinitive contributes the “non-past” sense of the construction, and, because it describes an activity, conveys the meaning of “having (in a very general sense) a non-completed activity”. There are two ways that one can “have” an activity: either one “has” an activity that one has completed, which can be expressed by the use of *have* with a verbal form that has a past sense, i. e. the past participle, where the combined meaning is one of a recently completed activity; or one “has” a non-past activity, which means that one still has it to do, either as a necessity (with an internal source), or as an obligation (with an external, social source).

The *have to* construction is rich in meaning, and its continued development is again a generalization, an emptying of meaning, which, we propose, takes place in a manner similar to the emptying of lexical meaning. One critical stage in this development is the appearance of an epistemic function. We propose that this is a metaphorical extension which gradually develops into a regular use. The obligation sense of *have to* predicates certain conditions on a willful agent: *x* is obliged to *y*. The epistemic sense is a metaphorical extension of obligation to apply to the truth of a proposition: *X* (a proposition) is obliged to be true. These uses have in common the presumption of external conditions creating the obligation. In the agent-oriented sense, the external conditions are usually social. In the epistemic sense, the external conditions are experiential — given a series of facts, the truth of *X* follows.

Evidence that an epistemic meaning is added via metaphorical extension rather than by a gradual weakening — to loss — of the obligation sense (cf. Fleischman 1982: 59), is that a sentence may be ambiguous between the two distinct readings, rather than just vague (Coates 1983). Consider, for example:

11. *Ingrid has to arrive before we do* (because she promised to help with the preparations).

12. *Ingrid has to arrive before we do* (because she set out an hour earlier).

The continuation of sentence (11) is compatible with an obligation reading, the continuation of (12) with an epistemic reading of prediction or confident inferral. Increasingly frequent use of the epistemic reading, which, since it does not require an animate subject, has fewer inherent contextual restrictions, leads to the gradual weakening of the specific meaning of obligation, comparable to the loss of the specific notion "in hand" originally belonging to the verb *have*. From here a future marker can develop, such as the *habere* future in Romance, or the *shall* future in English, which developed from an obligation modal.

We would like to emphasize the gradualness of the semantic generalization, and the tenacity of the agent-oriented reading, which can continue to survive (if only in a subtle form or in restricted contexts) long after the epistemic reading has apparently taken over. Thus the different nuances of meaning accompanying futures, and the possibility of more than one future marker existing in a language: Kiwai has three inflectional futures, Garo has four, and Zulu has two major future inflections. Though the grammars are often vague about the differences in usage between the various futures, we suppose that they might resemble the sorts of differences we find among the English futures *will*, *shall* and *be going to*, which are attributable to the different sources from which these futures developed. For instance, the obligation source of *shall* is clear, although in the spoken language an obligation sense is rarely used today. Indeed, *shall* is not frequently used at all any more, though it does occur in a prediction sense in Coates' 1983 corpus. In one major context in which it does survive, however, it still shows a contrast with *will*. Consider:

13. *Shall I fix you a sandwich?*  
 14. *Will I fix you a sandwich?*

The first question is paraphrasable by "Do you want me to fix you a sandwich?", while the second seems to be "Do I want to fix you a sandwich?", which is a very odd question. Coates labels the type of use in (13) addressee's volition, while (14) expresses the subject's volition. We suggest that the connotation of (13) is a remnant of the earlier obligation reading of *shall*. An obligation reading of *shall* in a first person question would ask if external conditions of a social



or physical nature are such that I should make a sandwich. In this case, the main condition is the addressee's volition. But another context can make the conditions more general:

15. *Shall I call a doctor for Harriet?*

Here it may not be anyone's volition but rather the physical condition of Harriet that is the obliging condition. *Will*, on the other hand, sometimes still expresses desire or volition, as we pointed out in section 2 with the examples *Will you go to a movie with me?* and *She will not set foot in his house*. Because *will* formerly expressed volition and not obligation, first person questions with *will* seem strange. Similarly, *be going to* sometimes expresses its former meaning of intention, and consequently first person questions are anomalous — cf. *Am I going to fix you a sandwich?* Yet *shall* formerly and *will* and *be going to* currently may express pure prediction or future without modal nuances in many contexts.

## 7. The motivation for grammaticization

Our cross-linguistic surveys lead us to the conclusion that there are universal paths of semantic change along which lexical meaning develops into grammatical meaning, and grammatical meaning further generalizes. Here we will consider briefly some questions concerning the motivation for the semantic change that leads to grammaticization.

First, we must dispose of the notion that communicative necessity motivates the development of grammatical categories. This cannot be so, because not all languages grammaticize the same categories. It does seem that all languages have the means to express all the aspectual and modal notions we have discussed in this paper, but many of them use full lexical items to express specific elements of modality and aspect, instead of developing generalized grammatical markers. Serbian, for instance, has no grammatical means of expressing obligation, but it does have several main verbs that are used for this purpose.

Rather than subscribe to the idea that grammatical evolution is driven by communicative necessity, we suggest that human language users have a natural propensity for making metaphorical extensions that lead to the increased use of certain items. The metaphorical extensions are cognitively based, and are similar across languages.

Thus the paths of development leading to grammatical meaning are predictable, given certain lexical material as a starting point. As the meaning generalizes and the range of uses widens, the frequency increases and this leads automatically to phonological reduction and perhaps fusion (Pagliuca 1982).

What is especially interesting, and especially difficult to explain, is the cross-linguistic agreement on the inflectional "endpoints" of grammatical development. There is a relatively small stock of semantic notions expressed inflectionally in the languages of the world (Bybee 1985), and these can develop out of a larger stock of lexical notions. For instance, we have seen that verbs meaning "want", "possess", "owe", or "go" can develop into grammatical markers of future or prediction.<sup>15</sup> Futures that develop from different sources will be slightly different from one another semantically because they may never fully lose all traces of their original lexical meaning, yet their primary function will be to mark the future. Why is it that so many different lexical meanings tend to reduce to a single grammatical meaning? Is there some sense in which *future* can be seen as a semantic prime at the grammatical level? Or is this simply the last stage of development in the sense that if the meaning reduces any further it will become functionless and be replaced by some other, richer, marker (as *will* replaced *shall*, and as the *go*-futures are replacing the *habere* futures in Romance)? These are the sorts of questions that need answers if we are to understand the nature, origins and evolution of grammatical meaning.

## Notes

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1. As Comrie uses the term "progressive", it is even more restricted than "continuous", since he uses it to describe a continuous aspect that is not used with stative verbs. A progressive would first be predicted to generalize to a continuous, and then to an imperfective.
2. Note that what would appear to be an equally likely generalization — that of a specifically habitual marker into a general imperfective — has not been mentioned in any of the sources we have consulted.
3. Inflection is distinguished from derivation in that the former is obligatory, in the sense that a finite clause requires some exponent of the category, and the absence of an explicit marker is in itself meaningful (Greenberg 1954).
4. For example, inceptive aspect is less than half as frequent as habitual as a general inflectional category, for it is usually restricted to a certain type of verb. Bybee (1985) has further details and discussion.

5. The 25, most of which are from the Perkins sample, are Ainu, Basque, Burushaski, Car, Diegueño, Dutch, English, Garo, Georgian, Haitian, Iatmul, Khmer, Kiwai, Kutenai, Luiseño, Maasai, Malayalam, Mandarin, Nahuatl, Navaho, Palaung, Serbian, Thai, Turkish, and Vietnamese. Some of these languages — in particular, English, Luiseño, Mandarin, Thai and Turkish — were chosen because we knew that they have interesting modality systems. Therefore, no reliable statistical analysis is possible with this sample.
6. Coates (1983) also groups these modal notions together, using the term Root Modalities to describe them. This is an extension of the term Root from its original use, which covered only obligation and permission, to include desire or volition and ability. We believe that the grouping proposed by Coates is appropriate cross-linguistically (although she has proposed it only for English), but regard the term “agent-oriented” to be more descriptive. Further, as we will see below, there are two types of possibility, an epistemic and a non-epistemic. We will use Coates’ term, Root Possibility, for the non-epistemic type. The classification that results is one in which Root Modality is a large class including all non-epistemic uses, and is further divisible into agent-oriented and non-agent-oriented modalities.
7. Of course, English *can* has a possibility reading as well, a point which we will discuss below.
8. While philosophers have grouped obligation and permission together as the deontic modalities, we have found that from a linguistic point of view the expression of permission is a rather minor function of modals. In examining a large number of reference grammars, we have found permission to be less frequently mentioned than the other modalities. Coates (1983) found permission to be the least frequently expressed of all modal notions in her sample of British English.
9. The kind of possibility expressed by *can*, however, is not true epistemic possibility. Coates calls it Root Possibility and contrasts it with the epistemic possibility expressed by *may*, *might*, and *could* in English sentences such as i. and ii.
  - i. *I could be a little late this evening.*
  - ii. *The keys might still be in the door.*
 In these sentences, the modal qualifies the speaker’s commitment to the truth of the proposition. *May*, *might*, or *could* can be substituted for the modal in these sentences with only small changes in meaning, but substituting *can* switches the meaning away from epistemic. The epistemic function of the modals in i. and ii. is also illustrated by comparing them with the nearly synonymous iii. and iv.:
  - iii. *I will perhaps be a little late this evening.*
  - iv. *The keys are perhaps still in the door.*
 A sentence with *can*, such as 6. in the text, however, is not paraphrasable with *perhaps*.
10. Many of these English developments are paralleled by developments in closely-related Germanic languages.
11. By “purely” epistemic modals we mean modals such as English *may*, *might*, and *will*, whose uses are almost always epistemic. However, because modals seem to retain some flavor of their original or former meanings in at least some contexts for a rather long time (cf. section 6), purely epistemic modals may be rare.
12. In Isthmus Zapotec, a language in the Perkins sample, the Potential inflection is sometimes translated by English *should* and *ought*. However, it is also used to express probable future, translated as “will probably” and “may”, and as a hortative. Thus its meaning appears to be rather general, and it is not clear whether the translations with *should* and *ought* indicate obligation readings.

13. For example, Fleischman (1982: 22) states that "only a relatively small percentage of the world's languages exhibit anything that might reasonably be described as a future tense."
14. Fleischman (1982) notes that the fusion of the Romance *habere* future coincided with the evolution of temporal functions. This is to be expected, given our hypothesis, but we want to point out that there is nothing inherent in the temporal meaning that in itself motivates a fusion.
15. Marchese (1979) also finds that verbs meaning "to come" can produce future auxiliaries in Kru dialects.

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