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22 Syntactic Change

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0 Introduction

Over historical time languages change at every level of structure: vocabulary, phonology, morphology and syntax. How and why such change occurs are the key questions addressed by the discipline of historical linguistics. From the perspective of modern generative grammar, language change is narrowly constrained by the requirement that all languages conform to the specifications of the human language faculty; but the fact of language change, like the brute fact of the structural diversity of the world's languages, marks a limit to the biological specification of language. Just how wide a range of variation biology allows is perhaps the major open question of theoretical linguistics; but whatever that range may be, it is the field on which historical developments play themselves out. The necessity for a richly specified Universal Grammar (UG) follows from the logical problem of language acquisition, so that the synchronic linguist considers as candidate analyses only learnable ones couched in theories that specify clearly what is to be learned and what is built in. The modern study of syntactic change, the topic of this chapter,[1] is also often couched in terms of learning; but, as we will see, the study of diachrony adds complexities of its own.

Language change is by definition a failure in the transmission across time of linguistic features. Such failures, in principle, could occur within groups of adult native speakers of language, who for some reason substitute one feature for another in their usage, as happens when new words are coined and substituted for old ones; but in the case of syntactic and other grammatical features, such innovation by monolingual adults is largely unattested. Instead, failures of transmission seem to occur in the course of language acquisition; that is, they are failures of learning. Since, in an instance of syntactic change, the feature that learners fail to acquire is learnable in principle, having been part of the grammar of the language in the immediate past, the cause of the failure must lie either in some change, perhaps subtle, in the character of the evidence

available to the learner, or in some difference in the learner, for example in the learner's age at acquisition, as in the case of change induced through second language acquisition by adults in situations of language contact. Our understanding of transmission failures is very limited, because our grasp of the relationship between the evidence presented to a learner and the grammar acquired is still imprecise. Studies of language acquisition generally take for granted that the evidence to which the learner is exposed is sufficient to ensure accurate learning by a competent language learner; that is, a child within the critical age period. This assumption is perfectly reasonable under normal circumstances but language change shows that there are limits to its validity. We do not know what these limits are, however, and it is not clear how to find them, given that experimentally manipulating the evidence presented to learners is neither practical nor ethical. In this context, documented cases of change have become interesting as natural experiments in language transmission. The interpretation of these experiments is, however, extremely difficult due to the limitations of the preserved evidence in quantity and sociolinguistic range and to the lack of native speaker informants. It is not surprising, therefore, that conclusive results have been hard to come by, and in what follows I will necessarily be describing as much or more the open questions and the research agenda of diachronic syntax as its established results.

1 Change and Stability

At the level of syntax, the amount of change that languages undergo over a given stretch of time varies tremendously, both from language to language and within the history of a single language. If, for example, we compare the syntax of English to that of Japanese from the medieval period to the present day, we find that English has changed enormously while Japanese has hardly changed at all. English has undergone three major word order changes: at the clause level, it has shifted from INFL-final to INFL-medial word order and from verb second to subject-verb order; and at the verb phrase level, it has changed from OV to VO order. Japanese, by contrast, has remained head final at all levels of structure. The existence of languages whose syntax has been stable over many centuries raises doubts as to the plausibility of theories of change that impute to syntax any inherent instability, and linguists differ on whether such instability exists. At the same time, syntactic change is a common phenomenon and may occur in the apparent absence of any external trigger. The English verb *do*, for example, seems to have developed spontaneously into an auxiliary from one of its main verb senses at some point in Middle English. The problem of why change occurs when and where it does is termed by Weinreich et al. (1968), in their foundational work on language change, the "actuation" problem; and it is, for all levels of structure including syntax, the biggest mystery in diachrony. The central issue here is whether languages are stable or unstable by nature; that is, leaving aside the effects

of language contact and other forms of social change, should we expect languages to manifest change or stasis? We do not know the answer to this question. It is important to recognize, moreover, that the answer may be different for different levels of linguistic structure. For instance, changes in pronunciation might arise spontaneously out of the well-known phonetic variability of speech, while endogenous changes at higher levels of structure might be rare or non-existent.

Given the centrality of imperfect language acquisition to the actuation of change, we are forced, when thinking about diachrony, to go beyond the standard generative idealization of instantaneous acquisition by an ideal learner. Under the standard idealization, after all, if we have a speech community in which all of the adult members have learned grammar G for language L and this situation has been stable for at least one generation, the language can never change, for a child born into such a community must also learn G. If not, how did the child's parents learn G, given that, by hypothesis, they were exposed to L? In other words, there appears to be no room for endogenous language change, a point which has been recognized by generative theorists in recent years (Lightfoot 1991, 1999, Clark and Roberts 1993). Of course, if the conditions of linguistic transmission are altered, for example, by contact with another speech community, then change may well occur, since the linguistic experience of children of the community is likely to change. Since language change is ubiquitous, it might seem that the standard model must be overly simple in some crucial respect; and linguists have proposed various complications to allow for endogenous change. For syntax, the most obvious proposal is that change at other levels of structure, however caused, provokes grammatical reanalysis. For example, the loss of morphological case distinctions due to phonological weakening at the ends of words is generally thought to lead to rigidity of word order to compensate for the increase in ambiguity induced by the loss of case. Thus, Dutch and German differ in the rigidity of order of pre-verbal constituents in the expected way: Dutch has lost its case endings and has nearly fixed word order in the verb phrase while German, which has retained the four-case system of early Germanic, allows fairly free reordering of verb phrase constituents. Similarly, when we compare Latin to its daughter languages in the Romance family, we find that word order has in various respects become more rigid, concomitantly with the loss of case morphology.[2] There is a sense, however, in which syntactic changes induced by prior morphophonological ones are not endogenously caused. Aside from the question of what has triggered the morphophonological changes, such changes do not require that we postulate any inherent instabilities or tendencies toward change within the syntactic module of UG or the grammars of particular languages. Instead, the morphophonological changes induce syntactic change simply by altering the evidence available to the learner.

Believers in endogenous syntactic change have postulated different mechanisms that introduce instability of one form or another into the acquisition of syntax *per se*. One early generative proposal that makes room for such syntactic

change is that of Andersen (1973), who suggests that child language learners faced with the linguistic data of their environment may hypothesize a grammar different from that of the speakers from whom their input comes. If the new grammar differs in its output from the original grammar only slightly, the learner may not notice the difference and so fail to correct the mistake. In other words, the child learner has direct access only to the data of language use, not to the grammar(s) that speakers use in generating that data; and the inferential process by which the child draws grammatical conclusions from the data is subject to error. There is no doubt that language transmission is sometimes imperfect, adult second language learning being the clearest such case. But the abstract possibility of imperfect transmission tells little about what changes or how much change to expect, because we do not know how accurately children learn the grammars of the speakers around them or what sorts of error they might characteristically make and not correct with maturation. Indeed, the stability of many languages over long periods of time, even with regard to small details, suggests that ordinary language acquisition cannot in general be very inaccurate. Also, even if it were, some factor or factors would have to impute a direction to its inaccuracies or to their spread in the speech community in order for observable language change to result from them. Since the time of Andersen's article, moreover, generative theory has moved in the direction of a more highly specified theory of UG, which seems to leave less room for erroneous learning, since less is learned to begin with.

Lightfoot (1991, 1999) has proposed a somewhat different approach to the relationship between learning and change. He argues forcefully against the notion of tendencies toward change inherent to syntax and against the possibility of a theory of change that would explicate such tendencies. Grammars change, in his view, when there is sufficient change in the data used by the learner to set grammatical parameters. Otherwise, they are stably transmitted. Lightfoot's view rules out endogenous change in syntax, but this leaves him with a problem in accounting for any changes not derivable from external sources like language contact or changes in phonology/morphology. One might decide that there are no such changes; certainly the case for them can be questioned. But Lightfoot leaves room for the possibility that languages may change in the absence of grammar change through drifts in the frequencies with which various sentence types are used. Eventually, this skewing of frequencies becomes so pronounced that learners are not sufficiently exposed to crucial data and thus acquire a different grammar from that of previous generations. Lightfoot's proposal does not depend on erroneous learning but it still depends on a fragile assumption; namely, on the existence of directionally consistent drifts in usage over long periods of time that are unconnected to grammar change. The evidence for such drifts is, at the least, uncertain. The best-studied cases of long-term syntactic drift are most plausibly cases of grammar competition (that is, syntactic diglossia) in which the competing forms may differ in social register, with an unreflecting vernacular variant slowly driving a conservative written one out of use (see below). Where no such process is at

work, there is evidence that usage frequencies remain stable over long periods of time. Thus, one common explanation proferred for the shift from verb final to verb medial word order in the history of English is a gradual increase in the frequency of rightward extraposition of complements and adjuncts (Aitchison 1979, Stockwell 1977).[3] There is, however, no careful quantitative study of extraposition in English from a diachronic perspective that takes into account what is currently known about the syntax of the language, so the hypothesis remains a speculation. Moreover, there is a quantitative study of the required type for Yiddish, which underwent an evolution similar to that of English (Santorini 1993); and although Santorini's sample is too small to permit absolute certainty on the matter, her figures indicate that the overall frequency of extraposition, though varying considerably from text to text, neither increases nor decreases across the five centuries covered by her sample.

Another example of stability in usage where one might have expected drift is adverb placement in English. We discuss below the loss of verb to INFL (V-to-I) movement in late Middle English, for which one piece of evidence is a change in the apparent placement of pre-verbal adverbs. The canonical position of such adverbs in Modern English is between the auxiliary verb and the main verb in sentences where both are present, as in (1):

(1) Mary has always preferred lemons to limes.

In finite clauses, the adverb appears after the tensed verb when it is an auxiliary and before it when it is a main verb, as illustrated in (2):

(2) a. Lemons are always preferred to limes.
    b. Mary always prefers lemons to limes.

As is well known, Middle English manifested a different placement of the adverb in sentences like (2b). Instead of appearing before the verb, it appeared immediately postverbally:

(3) Quene Ester looked never with swich an eye. (cited in Kroch 1989b)

The difference between the order in (2b) and (3) is standardly attributed to the loss, in early Modern English, of verb movement to a functional head, INFL, which hosts tense and agreement information.[4] In Middle English, as in Modern French and many other modern European languages, verb movement, which serves to license the tense and agreement features, is visible on the surface, in the case under discussion through the change in the relative position of the main verb and adverb in (3) relative to (2b). In Modern English, by contrast, this overt movement has been replaced, for main verbs but not for auxiliaries, by a grammatically equivalent covert process. Less often discussed than the above examples is the adverb placement possibility in (4):

(4) Mary always has preferred lemons to limes.

The word order here is less common than that in (1), but it is grammatical and occurs as a regular minority pattern in both modern and Middle English texts. It is notable that the grammaticality of (4) implies that (2b) is structurally ambiguous in Modern English, but not in Middle English. Because (2b) contains only one verb and because that verb does not move in Modern English, we cannot tell whether the adverb is in the pre-INFL position or in the position between INFL and the main verb. The two possibilities can be represented as follows:

(5) a. [IP Mary always [I ϕ] [VP prefers lemons to limes]]
b. [IP Mary [I ϕ] always [VP prefers lemons to limes]]

In Middle English, the verb always moves to INFL, so that the word order in (2b) implies a pre-INFL position for the adverb; that is, the analysis in (6):

(6) [IP Mary always [I prefers$_i$] [VP t$_i$ lemons to limes]]

Given this situation, we might have expected the following diachronic scenario in early Modern English: the gradual loss of V-to-I movement increased the frequency of examples like (2b); and since these examples were ambiguous, speakers concluded that, along with the loss of V-to-I movement for main verbs, the pre-INFL position for adverbs was becoming more frequent. This would then result in a rise in the frequency of examples like (4), where the pre-INFL position of the adverb is visible. However, no such increase occurs. On the contrary, corpus based estimates of the frequency of such examples show no change between late Middle English and today. It remains constant at about 15 per cent, with little variation from sample to sample (Kroch 1989b). Apparently, even where surface frequencies are changing, speakers are able to correctly associate such changes with their underlying grammatical cause, and they do not alter their rate of use of other structures which are string-wise but not structurally identical to those undergoing the change.

Although they do not settle the matter, the cases we have presented cast considerable doubt on the idea that the usage frequencies of syntactic options not connected to an ongoing grammatical change ever drift in the way that Lightfoot suggests. But before we leave the issue, we should consider another case, one where Lightfoot and others have documented an undoubted long-term historical evolution which might be considered an instance of drift. The case is that of the English modals, which began as morphosyntactically normal verbs in Old English and over centuries turned into a special class of words with distinct syntactic properties, crucially the failure to occur in non-finite contexts (Lightfoot 1979, Planck 1984, Warner 1983, 1993). Here the developments are complex and involve several distinct grammatical changes. To begin with, the modals came to be unique among verbs in lacking the third person singular ending (*-s* in Modern English). This happened because they belonged to the Germanic morphological class of "preterit-present" verbs, whose present

tense is historically a past form. In Old English there were several non-modal verbs of this class, but they all fell out of the language in early Middle English. A consequence of this development was that, as the second person singular *thou* with its corresponding *-st* verbal ending was replaced by *you* plus a zero inflection in early Modern English, the modals became unique among verbs in being totally uninflected. Second, the modal verbs generally resisted co-occurrence with the *to* infinitive as it spread in Middle English, while most other verbs adopted it. Thirdly, the past tense forms of the modals (*might, could, would*, and so forth) stopped signaling past tense in the course of Middle English and became instead indicators of subjunctive or conditional mood, as the morphological marking of mood on English verbs dropped out of use. Finally, the modals lost the ability to take noun phrase direct objects, the last clear signal that they were ordinary verbs. Lightfoot (1979) argues that once this last change occurred, learners no longer had sufficient evidence to categorize the modals as verbs and instead assigned them to a separate class, which could only occur under INFL. At this point, they became restricted to the position of the tensed auxiliary. There is no doubt that the drift described by Lightfoot is real, but its significance as a paradigm for diachronic evolution is doubtful. Warner (1983) has shown that what Lightfoot considers the signal of the reanalysis of the modals, their mid-sixteenth-century disappearance from non-finite contexts, actually occurs simultaneously with one of the changes that Lightfoot treats as a precondition for the reanalysis, the loss of direct objects, and before another putative precondition, the complete loss of verbal inflection. The loss of the second person singular occurs in the course of the seventeenth century, so the reanalysis must have taken place despite the evidence from this inflection. Furthermore, there are modern English auxiliaries – for example, auxiliary *do*[5] and the copula of the *is to V* construction – which have verbal inflection but cannot occur in non-finite contexts. Warner also points out that different modals appear to have lost their non-finite uses at different times, with *must* and *shall* far in advance of *can, may*, and *will*. Lightfoot (1991) accepts Warner's factual emendations but denies that they affect his conclusion that there was a reanalysis of the modals, that it occurred in the sixteenth century (though perhaps earlier for *must* and *shall*) and that it was an accumulation of exceptional properties that triggered the reanalysis. The alternative, however, is that the modals remain verbs, just with an increasing number of exceptional features. The more general point here is that no one has given a causal account of the drift that led to the modern situation, whether it ends in grammatical reanalysis or not. We would like to know whether the history of the modals is just a series of accidents or whether some directive force is involved, but we do not. Hence, even in this well-studied case, skepticism about long-term tendencies in syntactic change remains warranted.

The single most widely cited case for long-term tendencies in syntax is that of cross-category harmony. In his wide-ranging typological studies, Greenberg established certain very general correlations among linguistic features, which linguists have ever since tried to explain. In syntax, the most important of

these have been word order correlations across constituent types, which can be summarized as follows (Greenberg 1966): VO languages tend also to place adjectival and genitive modifiers after their head nouns and to be prepositional. OV languages tend to have prenominal adjectival and genitive modifiers and to be postpositional. If modifiers and complements are grouped together in opposition to heads,[6] these correlations can be seen to define two ideal word order types: head initial and head final. It has been claimed repeatedly that there is an overarching tendency in long-term linguistic evolution for languages to move in the direction of one or the other of these types because something in syntax favors cross-category harmony in directionality (Hawkins 1979, 1983). One immediate problem with this idea is that although a few languages, like Japanese or Irish, are consistently head final or head initial, most are inconsistent. For instance, English is VO and prepositional but has prenominal adjectives and genitives, while classical Latin and Farsi are OV but prepositional. Other languages, like Chinese or Yiddish, show an apparent mix of headedness at the clausal level, so that there is even controversy over whether they are VO or OV. The lack of consistency in directionality in most languages raises questions of how strong the pressure for harmony could possibly be and where in the system it could be located. Lightfoot (1979) points out that in learning a language children can have no access to any long-term tendency toward consistency. They simply learn the language to which they are exposed. Given this overwhelming fact, it is hard to see what causal force consistency could have.

Vincent (1976), relying on the work of Kuno (1974), has proposed a partial solution to finding the causal force behind cross-category harmony, based on the idea that harmony reduces perceptual complexity. As is well known, center embedded constructions are difficult to process, so much so that recursive center embedding often leads to a breakdown, as in the following standard example:

(7) a. The dog that the rat bit chased the cat.
    b. *The cat that the dog that the rat bit chased died.

Kuno shows that in SOV languages like Japanese there would be many more cases of center embedding with postnominal relative clauses than there are with the actual prenominal ones, while in VSO languages the reverse holds. Within the noun phrase, there is a similar correlation. If noun phrases are head final, center embedding will be induced when a noun takes a prepositional complement/adjunct, but not when it takes a postpositional one. If noun phrases are head initial, the situation is again exactly reversed. Thus, the tendency toward harmony may be driven by a pressure to minimize center embedding. Of course, there is at least one other way of avoiding center embedding; namely, extraposition of the offending constituent. Thus, German, though an SOV language, has postnominal relatives; but these are often extraposed to the right of the verb:

(8) a. . . . daß wir die Studenten [die der Professor uns vorgestellt
. . . that we the students whom the professor to-us introduced
hat] besucht haben
has visited have
"that we visited the students whom the professor introduced to us"
b. . . . daß wir die Studenten besucht haben [die der Professor
. . . that we the students visited have whom the professor
uns vorgestellt hat]
to-us introduced has

Repeated application of extraposition eliminates recursive center embedding:

(9) a. *. . . daß wir die Studenten [die der Professor [der Anglistik
. . . that we the students whom the professor who English
lehrt] uns vorgestellt hat] besucht haben
teaches to-us introduced has visited have
"that we visited the students whom the professor who teaches English introduced to us"
b. . . . daß wir die Studenten besucht haben [die der Professor
. . . that we the students visited have whom the professor
uns vorgestellt hat] [der Anglistik lehrt]
to-us introduced has who English teaches

Now, some SOV languages, Japanese among them, do not allow the sort of extraposition found in German, but it is not clear why different languages use different devices to mitigate the effects of center embedding. The basic problem here is that no causal mechanism is proposed that directly relates the processing problem posed by center embedding to language change. Until such a mechanism has been proposed, the putative connection between processing and change cannot be evaluated (see McMahon 1994 for further discussion).

In recent work on the history of Germanic, Kiparsky (1996) proposes a mixed model of the shift from OV to VO in those languages where it occurred. He suggests that the pressure for cross-category harmony or a similar endogenous pressure toward optimization[7] was the underlying ("effective") cause of the shift but that there was also an enabling cause, namely the rise of verb second (or perhaps INFL-medial) word order in subordinate clauses. Since the initial constituent of such a verb medial subordinate clause was almost always a subject, the surface word order in these clauses would be SVO whenever there was no auxiliary verb. Of course, the presence of an auxiliary would lead to S-Aux-OV order, unless the object was extraposed, which was also possible. In any case, Kiparsky says that due to the underlying preference for harmony, the languages shifted when the rise of verb second order in subordinate clauses reached the point where the pressure for harmony could overcome the remaining evidence in the input. He points out that learners are ordinarily very

sensitive to the input, even to low-frequency evidence, so that, by itself, the rise of subordinate clause verb second word order would not have triggered the shift from OV to VO. In consequence, he believes that the preference for harmony was a necessary additional factor. It is difficult to tell how likely Kiparsky's scenario is to be correct. In the two cases for which we have the best evidence, English and Yiddish, there is some reason to believe that the change was triggered by language contact (Santorini 1989, Kroch and Taylor to appear); that is, by an exogenous rather than an endogenous cause. More generally, however, it is important to realize that Kiparsky does not give us an account of how a learner would evaluate the optimization pressure against the pressure to cover the input data. Just as with Vincent's proposal, we will simply not be in a position to evaluate Kiparsky's account until a more highly articulated causal model is proposed. To reach this point with respect either to Vincent's or to Kiparsky's proposal will require considerable advances in our knowledge of language processing and learning, respectively.

2 Syntactic Change and First Language Acquisition

Understanding the relationship between language acquisition and language change requires answering the question of exactly what conditions of learning lead to the acquisition of a given grammar and how much these conditions must change before a different grammar is learned. These issues are centrally addressed in the work of Lightfoot (1979, 1991, 1999), who has argued that learners do not pay attention to all of the syntactic features of the language they are acquiring. In essence, they are sensitive only to root clauses (they are "degree 0 learners" in Lightfoot's terminology)[8] and only to specific cues that provide unambiguous evidence for given parameter settings, which are triggered on exposure to those cues. Other approaches allow the learner access to properties of embedded clauses and allow the learner to entertain different parameter settings on the way to learning the correct ones (Clark 1992a). Lightfoot has argued that there is diachronic evidence in support of his model of acquisition; but while there is no doubt that diachronic developments often show the effects of changing input data on output grammars, it is less certain that such data can help us to choose among models. One case where the promise and problems of this enterprise are particularly evident is Lightfoot's (1991) analysis of the shift from OV to VO in English. His argument goes as follows: Old English was underlyingly verb final, like modern Dutch and German. Although the clearest evidence for this parameter setting is found in subordinate clause word order, child learners do not have access to this information, so they must have set the parameter on the basis of main clause evidence. The best kinds of main clause evidence were main clauses with verb final order, which were possible in Old English (unlike modern Dutch and German),

and the placement of separable prefixes, which were left behind when the verb moved leftward to INFL or COMP, as it generally did in main clauses. The following examples illustrate these cases:

(10) he Gode þancode (Lightfoot 1991: (24c))
he God thanked
"he thanked God"

(11) þa *sticode* him mon þa eagon *ut* (Lightfoot 1991: (18a))
then stuck him someone the eyes out
"then his eyes were put out"

Over time these indications of the underlying position of the verb declined in frequency until, by the end of the Old English period (the twelfth century), they were no longer frequent enough for children to recognize that their language was underlyingly verb final. Instead, they reanalyzed it in accordance with the medial surface position of the verb. At the time of this reanalysis, subordinate clauses were still predominantly verb final, so that if children had had access to them as input data for acquisition, the reanalysis would not have occurred. Since main clauses had become almost entirely verb medial by the time of the reanalysis, however, we might ask what evidence there is that any such reorganization has taken place. Lightfoot's answer is that there was a catastrophic decline in the frequency of verb final word order in subordinate clauses between the end of the eleventh century and the first quarter of the twelfth, as found in the Peterborough manuscript of the Anglo-Saxon Chronicle. The relevant frequency drops from more than 50 percent verb final to less than 10 percent, apparently in striking confirmation of the hypothesis that the grammatical parameter is set on the basis of main clause word order and that subordinate clauses shift suddenly at the point of reanalysis.

However, one can raise significant linguistic and sociolinguistic objections to Lightfoot's account. Pintzuk (1991, 1993) has shown that the gradual rise of verb medial (more properly INFL-medial) word order in Old English on which Lightfoot is relying occurs in both main and subordinate clauses and, moreover, that the rate of increase is the same in the two contexts. This is an instance of the Constant Rate Effect (see below), which seems to hold in cases of grammar competition; and Pintzuk argues that Old English exhibited such competition in underlying word order; that is, that the existence of verb final main clauses, along with other features, shows that verb medial order in Old English was not a transformational variant of underlying verb final order, as it is in modern Dutch and German, but an independent parametric option. If Pintzuk is correct, the linguistic significance of the catastrophe in the Peterborough data becomes suspect; and there is, in fact, good evidence that the discontinuity is a sociolinguistic rather than a grammatical phenomenon. Up until 1122, the Peterborough manuscript was written in standard Old English and exhibited the predominantly verb final order found in other documents. In 1122, just at

the apparent point of reanalysis, the handwriting changes, as does the quality of the language. It is clear from the morphology and spelling that the new scribe no longer commands literary Old English. After all, more than fifty years had now passed since the Norman Conquest, which destroyed the Old English literary culture, so that the monks trained in that culture must all have died off. The monk who took over in 1122 was certainly writing a different sort of language than the scribe before him. Instead of literary Old English, he seems to have been using something closer to his vernacular; and if so, the sharp change in frequency observed by Lightfoot reflects a dialect difference, not an internal reanalysis. The vernacular, unsurprisingly, was more innovative than the written standard; hence, the jump in frequency of the progressive INFL-medial order. It would be going too far to say that the considerations we have raised definitively refute Lightfoot's account. Rather they raise questions that have not been answered. More generally, they show how delicate the interpretation of diachronic evidence is and suggest that it is much easier to explain the past through the study of the present than vice versa.

Given a set of assumptions about UG, successful acquisition of a language's syntax clearly depends on the interaction of its structural properties with the character of the learner, so that as we learn more about the latter, we have a hope of better understanding diachrony. In addition to these matters, however, there are issues concerning the robustness of the evidence for linguistic structure being acquired that arise specifically in the context of change. Clark and Roberts (1993) make this point in discussing the loss of V2 in Middle French, an example that is worth citing at some length (see Roberts 1993 for a full discussion of the historical issues). Old French was a V2 language, like the Germanic languages; but Clark and Roberts argue that the evidence for the V2 property in Old French was relatively weak because other properties of the language obscured it in a large fraction of the sentences that a learner would hear. First of all, Old French was a partial pro-drop language so that many sentences, like (12) below, were consistent with both a V2 analysis, as in (13a), and a non-V2 analysis, as in (13b):

(12) Si firent grant joie la nuit. (Clark and Roberts 1993: (51c))
so made great joy the night
"So they made great joy at night."

(13) a. [CP si [C firent$_i$] [IP pro t$_i$ grant joie la nuit]]
b. [IP si [IP pro firent grant joie la nuit]]

Second, more than a third of the sentences in the Old French corpus are subject initial, as in (14):

(14) Aucassins ala par le forest. (Clark and Roberts 1993: (51b))
Aucassin went through the forest
"Aucassin walked through the forest."

Such sentences gave no evidence that the language was V2, since their word order is consistent with what would be found in a non-V2 language with underlying SVO word order; that is, a sentence like (14) is equally compatible with either of the two analyses in (15):

(15) a. [CP Aucassins$_i$ [C ala$_j$] [IP t$_i$ t$_j$ par le forest]]
b. [IP Aucassins ala par le forest]

Only sentences with overt subjects and non-subject topics, like (16) below, provided the learner of Old French, through the inversion of the subject and tensed verb, with unambiguous evidence for V2:

(16) (Et) lors demande Galaad ses armes. (Clark and Roberts 1993: (51a))
(and) then requests Galahad his weapons.
"And then Galahad asks for his weapons."

Sentences which give conclusive evidence for a given parameter setting are said by Clark and Roberts to "express" the parameter; and in Old French, sentences expressing the V2 parameter were frequent enough to guarantee that it was learned, despite the high frequency of sentences that did not express it.

In Middle French, certain changes occurred that reduced the frequency of sentences expressing the V2 parameter. Most clearly, the use of left dislocation began to increase at the expense of topicalization. In left dislocated sentences, illustrated in (17) below, the initial constituent binds a resumptive pronoun and is adjoined to CP, thereby generating superficial verb fourth word order:

(17) [Les autres arts et sciences]$_i$, Alexandre les$_i$ honoroit bien.
the other arts and sciences Alexander them honored well
"The other arts and sciences, Alexander honored (them) well."

Clearly, these sentences do not express the V2 parameter, since fronting of the direct object occurs without inversion of the subject with the tensed verb. Contrary to appearances, however, the examples are consistent with a V2 analysis. First of all, the object pronoun, being a clitic attached to the tensed verb, does not count for position, just as in all of the other V2 Romance dialects. As the following example shows, the tensed verb in a topicalized sentence inverts with the subject, as expected in a V2 language, in the presence of a pre-verbal clitic pronoun:

(18) Toutes ces choses te presta Nostre Sires.
all these things to-you lent our Lord
"All of these things our Lord lent to you."

Second, the left dislocated object is adjoined to CP and belongs to a separate intonation phrase; and in consequence, it too does not count for position. The

other historical V2 languages, medieval German and Old English, for example, also exhibit this characteristic. Left dislocation is, however, infrequent in the stable V2 languages, including Old French; and as the frequency of left dislocation rises in Middle French, the evidence for V2 declines due to the concomitant drop in the frequency of sentences in which the subject and tensed verb invert.

Apparently, there was a change in the preferred prosody of French sometime during the Middle French period which favored placing a fronted constituent in a separate intonation phrase, something that is only possible with the left dislocation structure (Adams 1987). In Modern French, it is clear that sentences like (17) contain two phrase final contours and that they contrast with cases of focus movement, like (19), where there is no resumptive pronoun and the entire sentence constitutes a single intonation phrase:

(19) Dix francs, ce truc m'a coûté.
ten francs this thing me-has cost.
"Ten francs, this cost me."

It is not clear what caused the change in French prosody but it is clear what effect it had on the evidence for V2 available to learners. A further reduction in the frequency of sentences expressing the parameter may have resulted from a change in the status of subject pronouns in Middle French. It is well known that in Old French, subject pronouns, unlike object pronouns, were not clitics. By Middle French, however, they had developed into clitics; and Adams (1987) points out that the earliest apparent exceptions to V2 word order were overwhelmingly sentences with pronominal subjects, that is, with the word order XP-pro-V. If pronoun subjects by this point were clitics, these sentences would have been consistent with V2; but like the left dislocation cases, they would not express the V2 parameter. Hence, their rising frequency would have further reduced the evidence for the V2 parameter available to learners. At this point, the evidence might have become so weak that speakers abandoned the V2 hypothesis (Platzack 1995). Exactly why they should do so is, however, open to question. Clark and Roberts suggest that a combination of two factors was involved. First, sentences with the order XP-pro-V might sometimes have been taken by learners as exceptions to V2 rather than as consistent with it. This interpretation would have arisen because the clitic status of subject pronouns is less clear than that of object pronouns. Once this interpretation arose, learners would have been faced with two mutually inconsistent parameter settings for their language. In this situation, Clark and Roberts claim that learners would have opted for the grammar that assigned structurally simpler representations to sentences. The idea here is similar to the Transparency Principle of Lightfoot (1979), which states that syntactic derivations with fewer steps and whose surface outputs are closer to their underlying inputs are preferred to more complex derivations where the relationship between underlying and surface forms is more opaque.

The varying robustness of the evidence for V2 in different languages may be implicated in the different historical fate of the property across languages. Many of the medieval western European languages had the V2 property, and all of the Germanic languages except for modern English continue to obey it. English and the Romance languages, however, have lost the property. It is interesting that among the languages that retain V2, some are verb medial and some are verb final; but all of the languages that lost it are verb medial. In the case of English, the loss of V2 is subsequent to a shift from verb final to verb medial order (Kemenade 1987). This pattern raises the question of whether there are linguistic reasons why V2 might be a more stable property of verb final than of verb medial languages. Consider the following examples from German, a verb final V2 language:

(20) a. Er hat sie gesehen.
he has her seen
b. . . . daß er sie gesehen hat
. . . that he her seen has

The V2 property is generally limited to root clauses;[9] and where it does not apply, it is generally assumed that something close to the underlying order of the tensed clause will surface, as a necessary consequence of the architecture of UG; hence the verb final word order in (20b). The contrast between (20a) and (20b) gives a learner of German clear evidence that even simple subject initial sentences are V2.[10] In an underlyingly verb medial language, however, sentences equivalent to (20) provide no such evidence. This must be the point of Clark and Roberts's Old French example (14), though they do not explicitly raise the issue of the absence of a contrast with subordinate clause word order in the case of an SVO language. To see clearly what is at issue, consider the translation of the sentences in (20) into Swedish, a modern verb medial V2 language:

(21) a. Han har sett henne.
he has seen her
b. . . . att han har sett henne.
. . . that he has seen her

Here the subordinate and main clause word orders are the same and so provide no evidence to a learner, who must rely on other sentence types, most obviously root clauses with topicalized constituents like the following, which exhibit XVS order:

(22) Boken har jag inte köpt.
book-the have I not bought
"The book, I didn't buy."

Since roughly half of the sentences in conversational speech are subject initial, a much higher proportion of the sentences heard by learners of German give

evidence for V2 than for learners of Swedish. Of course, Swedish learners must hear more than enough sentences to acquire the V2 property, since all Swedish speakers acquire it; and since Swedish, like all the Scandinavian languages, has been stably V2 throughout its recorded history, the evidence must be robust. However, the diachronic syntax of English and French cast additional light on the matter of robustness. As we have seen, it is possible for changes to occur that weaken the evidence for V2 over verb medial structure for root clauses; but these changes only have their effect when they occur in a language whose underlying word order is already verb medial. In an underlyingly verb final language, surface SVO word order itself is evidence for V2. Hence, it seems that such a language could not lose the V2 property unless it first shifted from verb final to verb medial underlying order. In this way, the fact that no verb final V2 language has lost the V2 property would receive an explanation under a Clark and Roberts-type model.

It is sometimes thought that English is an example of just the path to the loss of V2 for verb final languages that this model requires, but the history and the grammar both are subject to different interpretations and the question remains very much an open one. Old English was largely verb final in subordinate clauses and verb second in root clauses; but by the beginning of Middle English (*c*.1200), the underlying order was almost entirely verb medial. At that point, the language was still verb second, but some time after 1250 verb second word order started to decline. By 1400 it was largely gone, at least in the Midlands dialects. The evidence for the verb second property was always somewhat complex in English because, in sentences with pronoun subjects, a combination of factors led to consistent verb third word order; that is, there was a systematic contrast between sentences like (23) and (24), taken from Pintzuk (1991):

(23) & of heom twam is eall manncynn cumen (WHom 6.52)
and of them two is all mankind come

(24) Ælc yfel he mæg don
each evil he can do

Since this distinction is already found in the oldest Old English documents, which date from the end of the eighth century, and V2 is stable until some time after 1250, the complexity here clearly did not interfere with the learning of the V2 property, a fact which raises questions about the relevance of the rise of subject clitics in the French case. On the other hand, it might well have been a predisposing factor, which only had its effect in combination with others, including the shift to underlying SVO word order. Another factor is that English always had certain initial adverbs that could induce verb third word order, as in the following Old English example from the Anglo-Saxon Chronicle entry for the year 892:

(25) Her Oswald se eadiga arcebisceop forlet þis lif.
in-this-year Oswald the blessed archbishop forsook this life.

Originally, only scene-setting temporal adverbs allowed this possibility, which is also attested in medieval German; but by early Middle English the range of adverbs that occurred with verb third word order seems to have widened, so that, alongside cases of V2, we find, in the earliest Middle English prose (texts in the West Midlands dialect from the first half of the thirteenth century), examples like the following from the "Ancrene Riwle":

(26) a. Þus Seint Iame descriueð religiun
thus Saint James describes religion
b. ofte a ful haȝer smið smeðeð a ful wac knif
often a full skillful smith forges a full weak knife
c. & þer god schawede him seolf to ham
and there God showed himself to them

These examples might be taken as the first indications of the loss of the V2 constraint, but this interpretation is doubtful because, in the case of topicalized arguments, V2 word order remains categorical in these texts. Nevertheless, the widening of the class of adverbs that allow verb third order certainly reduced the evidence available to the learner that the language was indeed V2. Again, the importance of adverb initial, verb third sentences to the historical evolution is hard to assess. It is known that the modern verb second languages allow verb third order with certain adverbial expressions, as in the following German and Swedish cases:

(27) Nichtdestotrotz, wir müssen weiter gehen.
nevertheless we must further go

(28) Utan tvekan, hon var mycket vacker. (cited in Platzack 1995)
without doubt she was very beautiful

Since these languages, crucially Swedish given the model we are exploring, are stably V2, such sentences may not have played much of a role in the English developments. Still, the range of adverbs that allowed verb third word order in early Middle English seems somewhat wider than in the stable V2 languages, and this difference may have been enough to affect the behavior of English learners.

Although it is suggestive that V2 word order begins to decline shortly after the definitive shift of English to verb medial order, it remains quite unclear whether the relatively weak evidence for V2 in Middle English really did play a role in the eventual loss of the property. At the same period (the middle of the fourteenth century) when V2 is clearly declining in the Midlands dialects

of English, the dialect of Kent in the south preserves V2 largely without change, though the grammatical conditioning of V2 is the same in Kent as in the Midlands and though Kentish is, at that time, strictly verb medial. On the other hand, in the north the loss of V2 seems to be more advanced than in the Midlands; but in the northern dialect our best evidence says that V2 word order was equally characteristic of sentences with pronoun subjects and of those with full noun phrase subjects (Kroch and Taylor 1997, Kroch et al. 1997). In other words, the evidence for V2 was actually stronger in the dialect which lost the property first than in the dialects where the loss occurred somewhat later. As we will see below, however, there might actually be a learning based explanation for this paradoxical circumstance once we take the effects of dialect contact into account.

3 Language Contact and Syntactic Change

One actuating force for syntactic change whose existence cannot be doubted is language contact. Examples of syntactic changes due to contact abound. Perhaps the most famous is the convergence in syntactic features – for example, the absence of the infinitive – that characterizes the Balkan languages (Joseph 1983), a genetically diverse geographical *Sprachbund* in which the Romance language Romanian, various Slavic languages, Greek, and Albanian have been in contact for many centuries. Another well-known example is the contact situation in Kupwar village in Maharashtra, India, where the Dravidian language Kannada is in contact with two Indo-Aryan languages, Marathi and Urdu (Gumperz and Wilson 1971; see also Nadkarni 1975 for a similar case). Middle English may also exemplify contact effects between Scandinavian and native Anglo-Saxon due to the Viking invasions of the ninth and tenth centuries, although there is controversy about the extent of Scandinavian influence on English grammar (Jespersen 1938, Kroch et al. 1997, Thomason and Kaufman 1988). Contact can lead to the borrowing of syntactic features, as when Kupwar Kannada adopts the use of the overt copula with predicate adjectives, on the model of Indo-Aryan, where standard Kannada has a zero copula. It can also lead to the loss of features that distinguish the languages in contact, which may have happened to the case marking in Anglo-Saxon where it was in contact with Scandinavian (Jespersen 1938). Most interestingly, there is the case of substratum effects, where adult second language learners acquire their new language imperfectly and pass certain features of this "foreign dialect" on to their children, who are, however, native speakers of the foreign-influenced language. Contact-induced language change is, of course, due to imperfect learning just as in the case of the hypothesized mechanisms discussed above, but the learners involved are often adults rather than children. We do not have any precise understanding of how or why speakers adopt features from surrounding languages in preference to features of their native language or why certain features of a native language are carried over into an adult learner's

second language. We do know, however, that grammatical features are not often borrowed by native speakers and, conversely, that they are likely to appear as interference effects in adult second language acquisition (Appel and Muysken 1987). Interference effects, in fact, point toward a causal account of certain kinds of contact-induced change. If a group of adults learn a second language imperfectly and if their second language usage becomes the primary linguistic data for a group of children for whom the adult learners are primary caretakers, the ordinary process of first language acquisition may lead straightforwardly to the adoption of "foreign" or "interference" features into the native language of the children, from whom it may spread to others. In this case, unlike in the case of inaccuracies in first language acquisition, there is no mystery about the cause of imperfect transmission.

The loss of V2 in Middle English is a case of change where there is evidence that contact played a part; and given the important role that discussion of this and similar changes has played in the recent literature on diachronic syntax, the evidence is worth a brief discussion. We should note at the outset that the evidence is, as so often, not conclusive; but it is suggestive and illustrates a line of research likely to grow in importance as the availability of annotated electronic corpora makes statistical studies more practical. We summarize here the analysis presented in Kroch et al. (1997) and in Kroch and Taylor (1997), whose statistics were drawn from the Penn–Helsinki Parsed Corpus of Middle English (Kroch and Taylor 1994). Kroch and Taylor and Kroch et al. give evidence that with respect to the grammar of V2, there were two dialects in Middle English, a northern dialect in which the tensed verb moved to COMP and a southern one in which the tensed verb moved only as far as INFL. The best evidence for this dialect difference is the word order in sentences with subject pronouns. As we have mentioned, V2 in Old English exhibited a peculiarity not found in the other Germanic languages: Topicalized sentences with full noun phrase subjects had XVS order but those with pronoun subjects had XP-pro-V order, as illustrated in examples (23) and (24) above. This peculiarity continues into Middle English in the Midlands and the south, but there is good evidence that the northern dialect behaved differently.[11] It had inversion with pronoun subjects as well as with noun phrase subjects, just as in the other Germanic languages. The following example from the Rule of St. Benet is illustrative:

(29) þe alde sal sho calle þarto
the old shall she call thereto

The difference between the northern and southern dialects is clear from table 22.1 of the frequency of XVS order for sentences with topicalized direct objects with full noun phrase and pronoun subjects respectively.[12]

Kroch et al. show that, although the evidence is indirect and limited, it is most probable that the dialect difference between north and Midlands/south goes back to the tenth century and may reflect Scandinavian influence on

Table 22.1 NP-V-S versus NP-S-V word order with noun phrase and pronoun subjects

	NP subjects			*Pronoun subjects*		
Dialect	*Number inverted*	*Number uninverted*	*% inverted*	*Number inverted*	*Number uninverted*	*% inverted*
Midlands	50	4	93	4	84	5
North	7	0	100	58	3	95

northern Old English. As we have noted, by the fourteenth century the V2 property is clearly being lost. That loss is most advanced in northern texts from areas in contact with the Midlands. Why should this be so? The answer seems to lie in the nature of the contact between the dialects. At the dialect boundary, (adult) speakers from the northern community were communicating with speakers whose usage of V2 would have seemed variable to them. They would have analyzed topicalized sentences with full noun phrase subjects spoken by speakers with the southern grammar as exhibiting movement of the tensed verb to COMP, since that is the analysis they would give to the same sentences in their own dialect. But the southern speakers would have used V3 word order with pronoun subjects, a usage that the northern speakers would have interpreted as a violation of the V2 constraint, since they would have had no reason to distinguish pronouns from full noun phrases in their syntax. From these data, the northern speakers would have concluded that the southerners were speaking a mixed language, with a V2 grammar and a non-V2 grammar in diglossic competition (see below). If the northern speakers accommodated to their interlocutors in the usual way, they would have produced some non-V2 sentences, but crucially with both pronoun and full noun phrase subjects. This accommodation would have provided learners with evidence of a non-V2 grammar, which would have entered their speech community as a competitor to the V2 grammar. Speakers of the southern grammar exposed to northern speech would not have been inclined to produce non-V2 sentences, since their northern interlocutors produced more surface V2 word order than they themselves. If anything, the southerners would have accommodated by producing some V2 sentences with pronoun subjects and learners might have acquired a V2 grammar with verb movement to COMP alongside the southern V-to-INFL option. We do not know why the non-V2 grammar won out in the north or why it eventually spread to all of Britain, but we have some evidence that the result was not foreordained. In Chaucer, whose dialect was south-east Midlands, we find a general adherence to V2 word order with both noun phrase and pronoun subjects. This is an instance of a southerner, though of unknown representativeness, picking up the northern pattern.

So it is perhaps due only to chance or the vicissitudes of social history that English today is not still V2.

4 The Diffusion of Syntactic Change

Studies of syntactic change which trace the temporal evolution of the forms in flux universally report that change is gradual. One of the most extensive studies of this type, Ellegård's study of the rise of the English auxiliary *do* (Ellegård 1953), contains a graph (figure 22.1) of the frequency of *do* + main verb against main verb alone, based on a sample of more than 10,000 tokens.

Other quantitative studies show a similar, roughly "S-shaped" curve of change. Before the rise of generative grammar, this sort of gradualness was taken for granted. Syntactic change, once actuated, was conceived primarily as a slow drift in usage frequencies, which occasionally led to the loss of some linguistic forms. New forms, whether they entered the language as innovations or borrowings, would normally affect the language only marginally at the outset and then, if adopted by the speech community, would spread and rise in frequency. With the advent of generative grammar, this way of thinking about change immediately became problematic. To begin with, generative theory, being a theory of grammatical well-formedness, is concerned with what forms are possible in natural language rather than with how often they are used. Usage frequencies might reflect stylistic preferences or psycholinguistic processing effects, but they had no place in grammatical theory. The

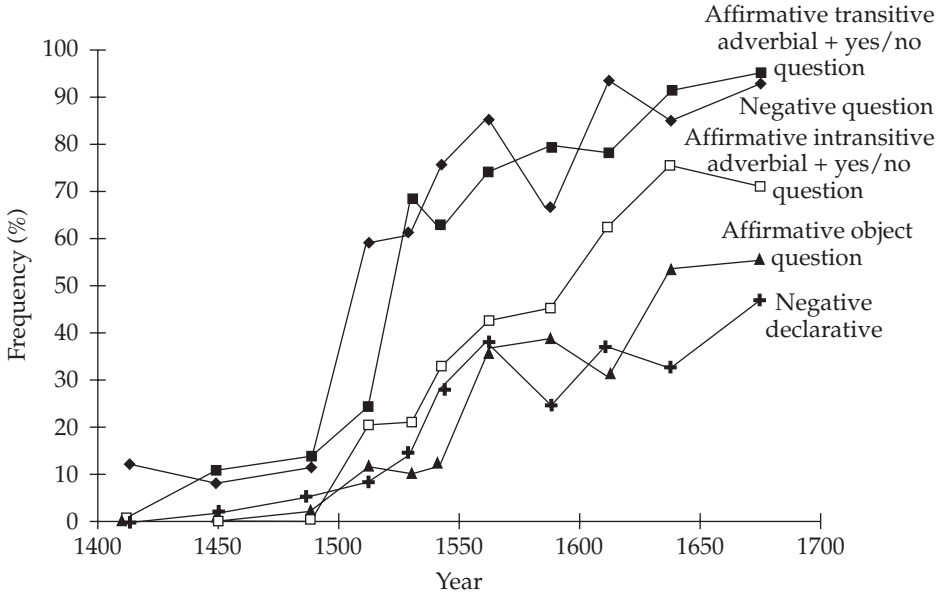

Figure 22.1 The rise of periphrastic *do* (adapted from Ellegård 1953)

gradualness of change, therefore, fell outside the domain of interest in early generative discussions. More recently, however, it has been recognized that gradualness poses something of a challenge to the theory of grammar because it characterizes not only shifts in stylistic preferences but also the diffusion of changes in syntactic parameter settings. For example, Roberts (1985) and Kroch (1989b) have argued that the rise of auxiliary *do* was a reflection of the loss of the raising of tensed main verbs to INFL, the position of tensed auxiliaries, an obligatory process which is characteristic of many European languages and which was entirely productive in Middle English. When this movement was lost, the association of tense with the verb was blocked in negative sentences, as was the movement of the verb to COMP in questions. The semantically empty auxiliary *do* was instead inserted into the INFL position, where it supported tense and, like other auxiliaries, moved to COMP when appropriate. Many analyses have been proposed for the modern English auxiliary system, but they generally share the property that auxiliary *do* is used only when V-to-I movement cannot apply. In languages where V-to-I movement is licensed for all verbs, it is obligatory and nothing like *do*-insertion occurs. Thus, it is something of a puzzle that the use of auxiliary *do* should be variable over more than 300 years of the history of English. As far as we can tell, moreover, other parametric options of syntax which undergo a change from one setting to another show the same sort of variable behavior during a more or less long period of transition. This has been shown to be true of the loss of V2 in English (Kroch 1989a), French (Fontaine 1985), and Spanish (Fontana 1993), as well as of the shift from verb final to verb medial word order in Old English, Ancient Greek, and early Yiddish (Pintzuk 1995, Taylor 1994, Santorini 1993).

Given the assumptions of generative grammar, variation in syntax which corresponds to opposed settings for basic syntactic parameters must reflect the co-presence in a speaker or speech community of mutually incompatible grammars. This is not an empirical question but a matter of the definition of the concept of parameter in the theory. In recent years, Kroch and his collaborators (see above citations) have uncovered evidence that supports this consequence of generative assumptions. They have shown, in several case studies, that the rate of change in different surface contexts reflecting a single underlying parameter change is the same. This result, known as the Constant Rate Effect, is what one expects if a single grammatical parameter is involved in a change and the mix of the two opposed settings is slowly changing over time in a given speech community. The effect is most easily illustrated in the case of the rise of auxiliary *do*. We will limit ourselves to the period from the beginning of the fifteenth century to the middle of the sixteenth in order to avoid complications introduced by the grammatical reanalyses that occur at the latter point in time (see Kroch 1989b for further discussion). When the rate of change in the use of *do* is estimated for the curves in figure 22.1,[13] the value is the same for every curve. This result is contrary to what most non-generativist students of quantitative variation have expected. The most explicit such discussion of the matter is due to Bailey (1973), who specifically claims

that the rate of change should vary by context, a result that is not easily reconciled with generative assumptions. The most striking quantitative fact in the story of *do*, however, is not a fact about the use of the auxiliary itself. Ellegård also gives data about the placement of the frequency adverb *never* with respect to the tensed verb which considerably strengthens the case for a close relationship between the rate of syntactic change across contexts and the underlying grammatical nature of the change. As we noted above, in a Middle English sentence with only one verb, the canonical position for *never* was immediately postverbal. Example (3), repeated here as (30), illustrates the point:

(30) Quene Ester looked never with swich an eye.

Since the order of verb and adverb in (30) reflects V-to-I movement, we expect the order to disappear as that movement is lost, giving way to pre-verbal placement of the adverb. This is indeed what happens, so that Modern English allows (31a), but not (31b):

(31) a. Jean never reads this newspaper.
b. *Jean reads never this newspaper.

Returning to Ellegård's quantitative data, we find that the rate at which the adverb–verb order replaces the verb–adverb order is the same as the rate of increase in the use of auxiliary *do*, thereby supporting the idea that a single parametric change underlies all of the surface contexts and that its progression is observable in the way the usage frequencies change over time.

The Constant Rate Effect links parametric change to grammar competition, but it introduces a quantitative element into the picture that inevitably adds a non-grammatical element to the study of diachrony. Nothing in the grammatical system undergoing change accounts for the rate of the change or for the fact that the change actually goes to completion rather than stalling or even reversing.[14] Why changes spread in the way that they do is little understood, though models of the process have been proposed. Niyogi and Berwick (1997) present a dynamical systems model under which child learners do not always converge on the target grammar of the language to which they are exposed. When, as in the cases discussed above, the evidence for a given parameter setting becomes weak enough, some learners will, due to random effects, not be exposed to enough data to set the parameter correctly. The result will be a mixed population in which some speakers have the old parameter setting and some a new one. In this mixed population, the next generation of learners will, on average, have less exposure to the data needed to set the parameter in the old way. Niyogi and Berwick show how such a population evolves under a range of assumptions about the nature and distribution of the linguistic evidence. In many cases, the population will shift from the original grammar to a new one along an S-shaped trajectory.

One difficulty with the Niyogi and Berwick model, aside from its hypothetical character, however, is that it presumes that the competing parameter settings are located in different speakers, so that the quantitative element in syntactic change is located in the population, not in the individual. However, the data from the empirical studies that reveal the gradual nature of change are not consistent with Niyogi and Berwick's model in this respect. On the contrary, in all of the studies we have cited, the variation in usage that reflects different parameter settings is found within texts. Indeed, texts from the same time period generally seem more similar than different in their frequencies of the competing variants. To model this variation, it is necessary to allow for syntactic diglossia within individual authors as the normal situation during a period of change.

Again, this conclusion is a logical consequence of the general assumptions of generative theory regarding the categorical nature of grammatical parameters. Furthermore, it is necessary to allow a description of individual speakers under which they have a propensity to choose between their diglossic grammars at a characteristic average rate. This rate, moreover, seems to characterize entire speech communities, and it is what changes over time as one of the grammars slowly drives the other one out of use. This way of thinking about change is, of course, commonplace in sociolinguistics, but generativists often object to it. There is no doubt, however, that human beings, like other animals, track the frequencies of events in their environment, including the frequency of linguistic events. Confusion over this issue has arisen because sociolinguists have claimed that probabilities of use should be integrated into grammars, a proposal which is not consistent with the generative paradigm. It is not necessary, however, to make this last move in order to relate variation in usage by individuals to syntactic change. Once a community becomes diglossic with respect to a given parameter setting, every speaker will learn both settings. The choice of which criterion of well-formedness to apply in the production of a given utterance is one that falls in the domain of performance and so is not an issue for grammatical theory. How learners acquire diglossic competence is, of course, an important issue for language acquisition, but there is no doubt that they do. That members of a community should converge on roughly the same average frequency of use of a set of available variants is not surprising, nor is it surprising that this average frequency should vary over time.

The most important question raised by the fact of textual syntactic diglossia in the course of language change is why it is unstable. There is some reason to think that bilingualism in general may be linguistically unstable, since even apparently balanced bilinguals show evidence of a dominant language under experimental conditions (Cutler et al. 1992). In other words, even when children learn two languages at a young age, the one learned first or more thoroughly seems to control certain features of language processing, which may induce a tendency to prefer that language in use, all other things being equal. If this were so, then one would expect to see a shift over time in favor of the true "native" language of a community in cases of syntactic diglossia. Of course,

this model depends on one of the diglossic variants being more native than the other. This would be true if, for example, it was the native variant for more speakers. It would also be true if the variants differed in social register. If one of the variants belonged to the vernacular (that is, the language learned in infancy), while the other belonged to a superposed prestige language acquired a bit later in life, then the necessary asymmetry would be established. This latter scenario seems particularly likely for the sorts of change that linguistic historians have data on. We are limited to the written language, often of societies with a low rate of literacy and sharp class distinctions in language. In these circumstances, it could easily be the case that the forms in competition in syntactic diglossia represent an opposition between an innovative vernacular and a conservative literary language. Since the former would have both a psycholinguistic advantage and the advantage of numbers, it should win out over time, even in written texts. Under this model, the gradualism found in texts might not reflect any basic mechanism of language change, but rather the psycho- and sociolinguistics of bilingualism. The actual (sudden) change in parameter setting would have occurred unobserved in the vernacular and only its competition with conservative educated usage would be accessible to study in the texts.

In some cases of change studied quantitatively, there is empirical evidence of register based diglossia behind the evolution of frequencies. The clearest such case that I know of is described in a study by Shi (1988, 1989) of the rise of the perfective aspect marker *le* in Chinese. What follows is a summary of Shi's discussion. The marker *le* did not exist in classical Chinese but it is ubiquitous in the modern language. Scholars have long known that the marker evolved out of the classical verb *liao* "to finish." Shi shows that this happened in several steps. First, *liao* started to occur with sentential subjects, but without any clear change of meaning, as in (32):

(32) [[junguan shi] liao] (Shi 1989: (7a))
army eat finished
"after the army's eating was finished . . ."

Then, it lost its main verb semantics, becoming an aspectual light verb (the so-called phase complement) in the resultative construction. At this point, it lost word stress and changed in pronunciation. This stage is observable in texts of the tenth century. Next, the new *le* became incorporated with its companion verb, so that it appeared before the direct object in a transitive sentence, as illustrated in (33):

(33) mei shi bu ken xiawen, huai-le yi sheng (Shi 1989: (11a))
every matter not will ask ruin-*le* a life
"if you don't ask questions about things, you will ruin an entire life"

At this point, the twelfth century, *le* had become an aspect marker. It was in competition with two other aspect markers *de* (from a verb meaning "to gain")

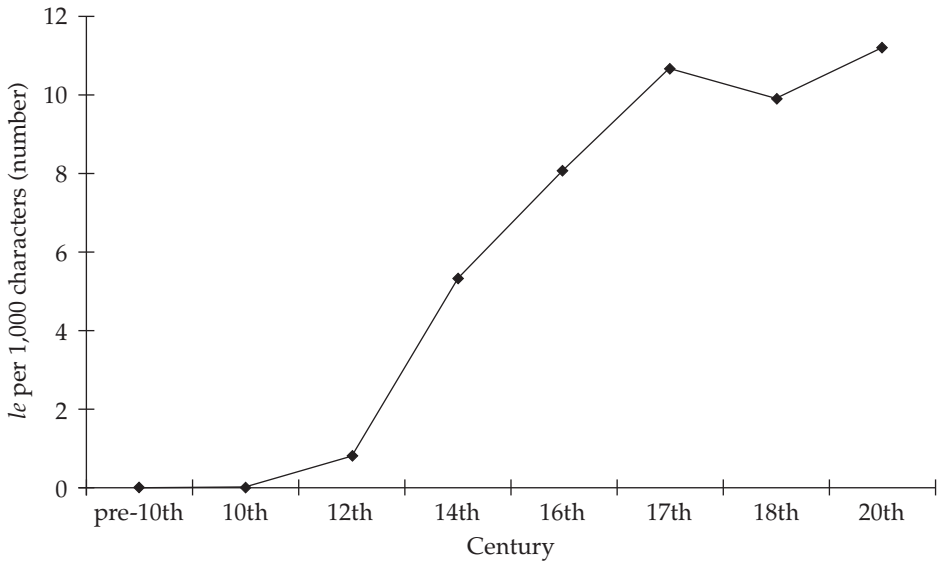

Figure 22.2 Frequency of *le* per 1,000 characters of text (Shi 1989)

and *que* (from a verb meaning "to lose"), which appeared in examples like the following:

(34) Zixu zhuo-de Weiling (Shi 1989: (12a))
Zixu catch-get Weiling
"Zixu caught Weiling"

(35) sun-que wushi yu ren (Shi 1989: (13a))
damage-lose fifty or-so man
"they lost about fifty men"

The two markers were both perfective but were specialized to positive and negative end states of a completed action, as the examples illustrate. Aspectual *le* replaced these two markers, first *que* and then *de*, and by the fourteenth century it was the unique perfective aspect marker. At this point the grammatical change was over. Shi's quantitative data, however, show that the frequency of *le* in texts has continued to increase up to the present day. Figure 22.2, which is based on approximately 2,700 instances of *le*, is drawn from Shi (1989).

Shi raises the question of why the frequency of *le* continues to rise for 600 years after the grammatical change that introduced and spread the particle had gone to completion, and he gives the following answer. Written Chinese since the tenth century has been diglossic, using elements of both the classical language and the vernacular. The classical language lacked the aspect marker *le*, which arose in the course of the evolution of the vernacular, and it seems

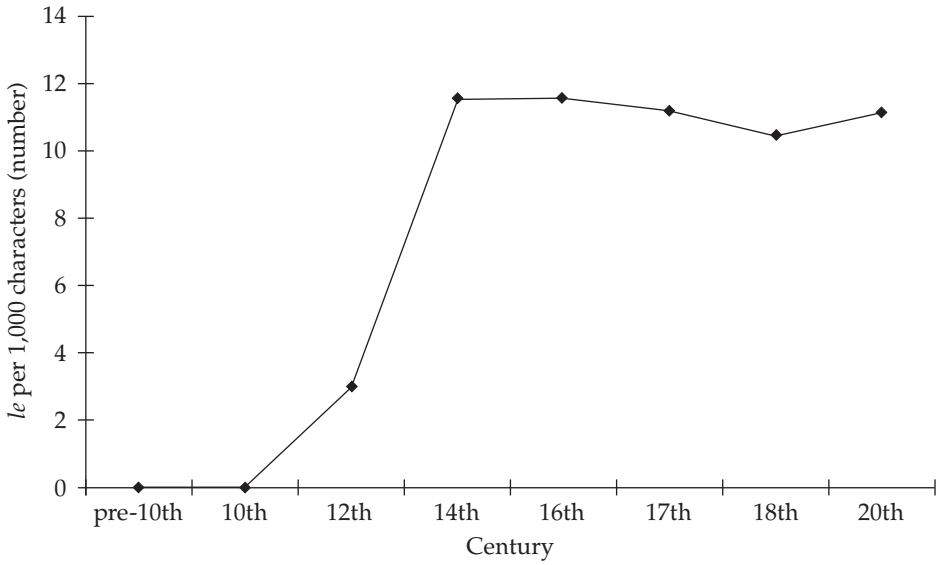

Figure 22.3 Frequency of *le* per 1,000 vernacular characters of text (Shi 1989)

that classical verbs never co-occur with *le* in mixed texts. In consequence, the rise of *le* after the fourteenth century reflects not a continuing grammatical change, but an increasing use of the vernacular language in written documents. Shi demonstrates his point by constructing an estimate of the amount of classical language in texts, using the classical interjective particle *ye* as an indicator of classical language. Over time, the frequency of *ye* declines, indexing the decline in classical usage. When the frequency of *ye* in texts is used to correct for the degree of classical admixture, the frequency evolution of *le* over time changes character dramatically, as can be seen in figure 22.3.

Figure 22.3 shows clearly that there is no change in the use of *le* in the vernacular after the fourteenth century. All of the apparent change is due to a continuing shift in the overall diglossic mix in favor of increased use of the vernacular. We do not know to what extent this Chinese case is representative of change in textual frequencies in general, but its existence warns us against assuming that changing textual frequencies have linguistic rather than sociolinguistic significance.

Given the strong possibility that textual data do not give evidence for the process of language change in a vernacular, there is a real need for the study of syntactic innovations in living languages, using sociolinguistic methods to observe unreflecting speech. Such studies do not at present exist, in part because syntactic change is relatively rare and hard to catch on the fly. In their absence, we can construct abstract models of change in the style of Niyogi and Berwick or more concrete scenarios, like the Clark and Roberts declining-evidence scenario for the loss of V2 in French or our dialect contact scenario

for the loss of V2 in Middle English (see above). These are useful hypotheses, no doubt, but unless they can be further specified to make empirically testable predictions, they will remain speculative. Finding a way to derive such predictions is a major task for the future of diachronic syntax.

5 Conclusion

Weinreich et al. (1968) divide the problem of change into five related subproblems: actuation, constraints, transition, embedding, and evaluation. The actuation problem is that of why change in a particular structural feature occurs when it does in a particular language and why the change may not occur at all in other languages that share the same feature. The constraints problem is that of what changes are possible for a language in a given state. The transition problem is that of how a language moves from one state to a succeeding state. The embedding and evaluation problems are those of how a change is related to other features of the language in which it occurs and what effect it has on these other features. In the study of syntactic change within the generative tradition, these problems remain basic. They receive a somewhat different formulation than in the original work, however, because of the emphasis that generative theory places on UG and on language acquisition. This new formulation gives partial answers to some of the problems but, more importantly, it sharpens them and brings certain difficulties into focus. Consider first the actuation problem, which Weinreich et al. consider to be the heart of the matter. As we have seen, to the extent that language learning is limited to the critical period of early childhood and that children accurately learn the language of their parents, both substantive assumptions, generative theory must locate syntactic change outside the ordinary chain of grammar transmission. The constraints problem, from the generative perspective, is partly just the problem of the limits that UG places on language variation. Since children learn whatever language they are exposed to, there are no grammatical constraints, apart from those embodied in UG, on possible changes. This raises the question of why languages do not under normal circumstances undergo catastrophic reorganizations. The transition problem becomes the issue of how changes in the grammars of individuals propagate through the community. The issue of gradualness of change and how to account for it arises here, and it seems that grammatical and sociolinguistic perspectives can interact fruitfully on this problem. Finally, the embedding and evaluation problems receive a very specific answer in generative syntactic terms: to the extent that differences among the grammars of specific languages are limited to different choices of the settings of a finite number of universal syntactic parameters, the syntactic features of language subject to change are independent of one another. The issue raised here is what to make of changes that appear to be correlated with one another but are not grammatically linked, like the drift of the English modals toward specialization as auxiliaries. Although none of the problems posed by Weinreich

et al. has been solved in any definitive way in consequence of work in diachronic syntax by generativists, this work has succeeded in creating a lively field with well-posed problems on its agenda and a fruitful dialectic between theoretical concerns and empirical findings.

NOTES

* Most of what I know about diachronic syntax, I have learned from years of discussion with my collaborators and colleagues in the field. Thanks for this ongoing dialog go first to my students and collaborators, especially Susan Pintzuk, Beatrice Santorini, and Ann Taylor, my collaborator on the Penn–Helsinki Parsed Corpus of Middle English. Thanks are due also to many other colleagues: Robin Clark, Antonio and Charlotte Galves, Ans van Kemenade, Paul Kiparsky, David Lightfoot, Donald Ringe, Ian Roberts, and Anthony Warner. I have mentioned a few but there are many more. Finally, I want to thank Gene Buckley, Caroline Heycock, and Beatrice Santorini for their close readings of an earlier draft of this chapter. Their suggestions have improved it, though there are undoubtedly many weaknesses left, which remain my responsibility.

1 The field of historical syntax can be divided into two parts: the study of the grammars of languages of the past and the study of changes in grammar attested in the historical record. The first subfield is best considered a branch of comparative syntax which tries to reconstruct, through textual evidence, the grammars of languages that lack living native speakers. The second subfield studies the problem of the diachronic instability of syntax and the transition between grammars. These two fields cannot be entirely separated in practice, since the study of the transition between grammars implies knowledge of the initial and end states. Nevertheless, it is the diachronic aspect of historical syntax that has the most interest for linguistics as a whole since it is in this domain that historical syntax contributes something not available from the synchronic study of extant languages. For this reason, I have chosen to focus on the diachronic aspect of historical syntax in this chapter.

2 As Kiparsky has pointed out (1996), rich case marking seems to be a necessary but not a sufficient condition for word order freedom. Icelandic, for example, has at least as rich a case marking system as German, but fairly rigid SVO word order. The one-way direction of the implication suggests that the connection between case marking and word order is indirect. The syntactic parameters ultimately responsible for the degree of word order flexibility need not make any direct reference to morphology. Instead, speakers of languages with flexible word order of certain types which lose their case marking might be expected to restrict themselves to fixed word order in their language use to avoid misunderstanding.

Learners would then not hear enough word order variation to conclude that the language allowed free word order.

3 See also Vincent (1976) for an application of this idea to the shift from SOV to SVO in the history of Romance.

4 For ease of exposition, I assume the phrase structure of *Barriers* (Chomsky 1986b) with only two functional heads at the clausal level, I(NFL) and C(OMP).

5 Auxiliary *do* certainly has the indicated property in American English. Whether it does in British English depends on the analysis of verb phrase ellipsis examples like (i):

i. He said that he'd come, and he may have done.

It is not clear whether the non-finite *do* in this example is the same morphosyntactic element as the finite auxiliary (see Pullum and Wilson 1977 for a useful discussion).

6 The decision to do so is not unproblematic. In logical form modifiers are naturally treated as functions that take their heads as arguments, mapping a phrase of a given denotation type to a larger phrase of the same type, while complements seem to be arguments of their heads, which are themselves functions. In other words, the assignment of phrases to function or argument status is reversed in the case of modifier–head and head–complement relations.

7 Kiparsky suggests that the work done by pressure for cross-category harmony could be replaced by a pressure toward simplicity of derivations (really transparency in the sense of Lightfoot 1979; see below) if one assumed the anti-symmetry theory of Kayne (1994). The idea is that deviations from surface SVO word order would be costly because they required the postulation of leftward movement rules, which would complicate derivations and would be disfavored, all other things being equal. This variant of Kiparsky's proposal raises the same explanatory issues as the one discussed in the text.

8 More precisely, learners are sensitive to unembedded binding domains, which include the subjects of subordinate clauses under certain conditions.

9 I leave aside the West Germanic language Yiddish and the North Germanic language Icelandic, for which evidence of this limitation is largely lacking.

10 A Lightfoot-style degree 0 learner would rely on main clause evidence like the position of negation and separable prefixes to arrive at this conclusion. The contrast between the SOV and SVO verb second languages remains.

11 There are no northern prose manuscripts from before 1400 so conclusions about northern Middle English are based on indirect evidence. The best evidence comes from the Northern Prose Rule of St. Benet, an early fifteenth-century document from an isolated part of Yorkshire that seems to have preserved features from an earlier time.

12 The small number of exceptions to the pattern may be early signs of dialect contact that becomes increasingly important over time.

13 The technique used for this estimation is logistic regression, the most appropriate statistical technique for frequency data of this sort (Altmann et al. 1983, Aldrich and Nelson 1984).

14 Susan Garrett, in an unpublished study, describes a reversal in the history of Spanish negation. In the early thirteenth century the use of "any" words (*alguno*, etc.) becomes possible in negative concord contexts in place of the usual "no" words (*ninguno*, etc.). Then between 1200 and 1600 there is a modest but steady increase in their use. After 1600, this usage declines again until in the modern language it is no longer possible.