Our nineteenth-century predecessors developed linguistics as a distinct discipline and they were concerned exclusively with language change. They thought of texts as the essential reality and took languages to be entities “out there,” existing in their own right, waiting to be acquired by groups of speakers. For them, languages were external objects and changed in systematic ways according to "laws" and general notions of directionality. Languages were related to each other to different degrees, modeled in tree diagrams (Stammbäume), and they changed at certain rates which could be discovered. Linguists of the time focused on the products of human behavior rather than on the internal processes that underlie the behavior. By the end of the nineteenth century, the data of linguistics consisted of an inventory of sound changes but there were no general principles: the changes occurred for no good reason and tended in no particular direction. The historical approach had not brought a scientific, Newtonian-style analysis of language, of the kind that had been hoped for, and there was no predictability to the changes. The historicist paradigm - the notion that there are principles of history to be discovered - was largely abandoned in the 1920s (Lightfoot 1999: ch2).

Languages were seen as objects floating smoothly through time and space, and that image survived the twentieth century. Despite the move away from historicism in the 1920s, linguists resumed the search for historical principles in the latter decades of the 20th century. In the 1970s much work recast the notion of "drift", originated by Sapir 1921: ch.7. The “typologists,” working from Greenberg’s (1963) word order harmonies, claimed that languages changed along universal diachronic continua, moving from one pure type to another via universally defined transitional stages. Languages change from one pure type to another by losing/acquiring the relevant orders in the sequence specified by the hierarchies. A pure subject-verb-object language, for example, has verb-object order, auxiliary-verb, noun-adjective, and preposition-DP, and these orders are ranked in a hierarchy. A subject-object-verb language is essentially the mirror image and has the opposite orders: object-verb, verb-auxiliary, adjective-noun, and DP-preposition, etc. If a language changes from the object-verb type to the verb-object type, it acquires all of the new orders in the sequence prescribed by the hierarchy: first verb-object, then auxiliary-verb, and so on. The hierarchy is the substance of a historical law which stipulates how a language of one type changes to a language of a different type. The typologists argued that notions like the subject-object-verb-to-subject-verb-object continua constituted diachronic explanations (Vennemann 1975); for them, the drift was the explanatory force, rather than being something which required explanation, and no local causes were needed. The typologists remained faithful to the methods of the nineteenth century. They dealt with the products of the language capacity rather than with the capacity itself, and they retained the same kind of historical determinism, believing that languages of one type change inexorably to a language of another type, like their nineteenth-century predecessors. The goal remains one of
finding ‘straightline explanations for language change’ (Lass 1980), generalizations which would hold of history. And they were no more successful.

A more recent line of work has emphasized the alleged unidirectionality of change, also treating languages as external objects "out there," subject to change in certain inevitable ways. Grammaticalization, a notion first introduced by Antoine Meillet in the 1930s, is taken to be a semantic tendency for an item with a full lexical meaning to be bleached over time and to come to be used as a grammatical function. Such changes are said to be quite general and unidirectional; one does not find changes proceeding in the reverse direction, so it is said. I shall discuss an instance of grammaticalization in section 3 and there are many examples (Hopper & Traugott 1993). Grammaticalization is a real phenomenon but it is quite a different matter to claim that it is general, unidirectional or an explanatory force. If there were a universal tendency to grammaticalize, there would be no counterdevelopments, when bound forms become independent lexical items (affixes becoming clitics or independent words - an example of this to be discussed later in this chapter is genitive endings in -es in Middle English being reanalyzed as his, yielding genitives like Christ his sake, Mrs Sands his maid); for further examples and discussion, see van Gelderen 1997, Janda 2001, Joseph 2001, Newmeyer 1998: ch5. When grammaticalization takes place, it is explained when one points to local factors which promoted the new grammar, new triggering experiences, changes in cues, or what Kiparsky (1996) calls the ‘enabling causes.’ Grammaticalization, interesting as a PHENOMENON, is not an explanatory force.

2. Focusing on I-language.

In the 1970s, as the typologists were developing their determinist approach to change, others began to study language change in the context of the acquisition of grammars. If we switch our perspective from language change to grammar change, from the products of the language system to the system itself, from E-language to I-language (Chomsky 1986), we explain grammatical change through the nature of the acquisition process. Grammar change is just one part of language change, but a central part; language change goes beyond grammar change and may involve the changing USE of grammars or social variation (see the introduction to Lightfoot 2002).

Grammars are formal characterizations of an individual’s linguistic capacity, conforming to and exploiting the tools provided by a universal initial state (‘Universal Grammar’) and developing as a person is exposed to her childhood linguistic experience. A grammar, in this terminology, is a mental organ, in fact a person’s language organ, and is physically represented somehow in the brain, ‘secreted’ by the brain in Darwin’s terminology (Anderson & Lightfoot 2002). A grammar grows in a child from some initial state (UG), when she is exposed to primary linguistic data (PLD) (1).

1. PLD (UG --- grammar)

Furthermore, grammars may change over time: people developed certain grammars in London in the thirteenth century and different ones in the fifteenth century. The only way a different grammar may grow in a different child is when that child is exposed to significantly different primary data. In that case, the linguist wants to find how grammars changed and how the relevant childhood experience might have changed just prior to the change in grammars, in such a way that the new grammar was the only possible outcome. In this perspective, the study of
grammar change is fused with work on variation and the acquisition of grammars. We explain
the emergence of the new grammar and the explanation illuminates the nature of the child’s
triggering experience and the way in which children acquire their linguistic capacities; the study
of grammar change has implications for grammatical theory and for theories of language
acquisition.

Grammars differ sharply: a person either has a grammar with a certain property, or not.
People’s speech, on the other hand, is in constant flux and languages, conglomerations of the
output of people’s grammars, are inherently fluid, unstable, always changing. Speech is always
in flux and no two people have the same initial experiences. While the primary linguistic data
(PLD) are infinitely variable, grammars are not; under parameter theory, there is a finite number
of grammars, resulting from different settings of a finite number of parameters. If we re-cast
parameters in terms of cues (see below), there is a finite number of cues for which a child scans
her linguistic environment. Grammars are generally supposed to be algebraic (finite and ranging
over infinity) and modular (consisting of different types of mechanisms), and to involve
computational operations of a special kind. For discussion of the three entities in (1), sometimes
called ‘the analytical triplet’, see Anderson & Lightfoot 2002.

Language change is a group phenomenon. Languages, whatever they may be precisely, reflect
the output of grammars, the varying use of those grammars in discourse, and social variation in
the set of grammars that are relevant for any particular language. Language change can
sometimes be tracked geographically, seeing some new variant attested in different places at
different times. And change at the level of languages often seems to take place gradually,
spreading through the population socially and geographically.

The linguistic experience of young children (their PLD) varies constantly, but sometimes small
variations have bigger, structural consequences, changes in grammars. Grammar change, change
in structures, is different; if grammars are abstract, then they change only occasionally and
sometimes with dramatic consequences for a wide range of constructions and expressions;
grammar change tends to be ‘bumpy’, manifested by clusters of phenomena changing at the
same time, as we shall see. Grammatical change is contingent, dependent on the details of the
use of language (for example, changing morphology, changing distribution of words and
construction types), language contact, perhaps even social attitudes and second language
acquisition. Grammar change is linked to changes in people’s speech, and we can only know
about it by studying what people say, often through written texts, and it must be studied in
conjunction with other kinds of change. But grammar change constitutes a distinct type of
change, a reaction to contingent factors of language use, and the new grammars emerge subject
to the usual principles of UG. The study of the contingent events is complementary to the search
for the general organizing principles of UG, but there is a different focus. To focus on grammar
change, on I-language, is to attend to one aspect of language change, one which illuminates the
variation and acquisition of grammars by children, but one which is dependent on other kinds of
language change.

The explanatory model is essentially synchronic and there will be a local cause for the
emergence of any new grammar, namely a different set of primary linguistic data. I will offer
two case studies.

3. English auxiliary verbs.
English modal auxiliaries like can, could, may, might, will, would, shall, should, and must differ from ordinary verbs in their distribution. A modal auxiliary does not occur with a perfective (2) or present participle (3), unlike a verb; a modal does not occur in the infinitival complement to another verb (4), nor as the complement of another modal (5), unlike a verb like try; and no modal may occur with a direct object, whereas some verbs may (6).

2.a. *He has could understand chapter 4.
   b. He has understood chapter 4.
3.a. *canning understand chapter 4, ...
   b. Understanding chapter 4, ...
4.a. *He wanted to can understand.
   b. He wanted to understand.
5.a. *He will can understand
   b. He will understand.
6.a. *He can music.
   b. He understands music.

The distribution of these modal auxiliaries is peculiar to modern English. For example, the French verb pouvoir ‘can’ behaves the same way as a verb like comprendre ‘understand’: unlike can, pouvoir may occur as a complement to another verb (7), even to another modal verb (8), and may take a clitic direct object (9), and to that extent it behaves like ordinary, common-or-garden verbs in French. In French grammars, the words which translate the English modals, pouvoir, devoir, etc., are verbs, just like comprendre.

7. Il a voulu pouvoir comprendre le chapitre.
   ‘He wanted to be able to understand the chapter.’
8. Il doit pouvoir comprendre le chapitre.
   ‘He must be able to understand the chapter.’
9. Il le peut.
   ‘He can it,’ i.e. understand the chapter.

Furthermore, not only may languages differ in this regard, but also different stages of one language. Sentences along the lines of the nonexistent utterances of 2-6.a were well-formed in earlier English. If the differences between Old and modern English were a function of separate features with no unifying factor (Ross 1969), we would expect these features to come into the language at different times and in different ways. On the other hand, if the differences between Old and modern English reflect a single property in an abstract system, a categorical distinction, then we would expect the trajectory of the change to be very different. And that’s what we find. If the differences between can and understand were a function of the single fact that understand is a verb while can is a member of a different category, Inflection (I), then we are not surprised to find that 2-6.a dropped out of people's language in parallel, at the same time.

In Middle English Kim can understand the chapter had the structure (10) and in present-day English (11). If in present-day English can is an I element, then one predicts that it cannot occur to the left of a perfective or present participle, as in 2.a, 3.a (those participial markers are generated within the VP), that it is mutually exclusive with the infinitival marker to (which also occurs in I) (4.b), that there may only be one modal per VP (5), and that a modal may not be followed by a direct object (6.a). Simply postulating the structure of 11 accounts for the data of 2-6 in present-day English. Earlier English had structures like 10, where can is a verb and
behaves like *understand*, moving to a higher functional position. If one thinks in terms of a certain kind of abstract system, then there is a single change which accounts for the phenomena of 2-6.

10. Middle English  
   11. Present-Day English
   
   If we attend just to changing phenomena, the historical change consists in the *loss* of various forms, not in the development of new forms; people ceased to say some things which had been said in earlier times. Before the change, all of the utterances in 2-6 might have occurred in a person's speech, but later only those forms not marked with an asterisk. That fact alone suggests that there was a change in some abstract system. People might start to use some new expression because of the social demands of fashion or because of the influence of speakers from a different community, but people do not *cease* to say things for that sort of reason. There might be an indirect relationship, of course: people might introduce new expressions into their speech for external, social reasons, and those new expressions might entail the loss of old forms. Changes involving only the loss and obsolescence of forms need to be explained as a consequence of some change in an abstract, cognitive system. This methodological point is fundamental.

If one focuses on the final disappearance of the relevant forms, one sees that they were lost as a set and not individually. The most conservative writer in this regard was Sir Thomas More, writing in the early sixteenth century. He used all of the starred forms in 2-6.a and had the last attested uses of several constructions. His grammar treated *can*, etc. as verbs in the old fashion (10), and the fact that he used all the relevant forms and his heirs none, suggests that his grammar differed from theirs in one way and not that the new grammars accumulated unrelated features. Similarly for other writers: either they used all the forms of 2-6.a or none. The uniformity of the change suggests uniformity in the analysis. There was a single change, a change in category membership: *can*, etc., formerly verbs which moved to I in the course of a derivation, came to be analyzed as I elements (11). The fact that there was a single change in grammars accounts for the bumpiness: several phenomena changed simultaneously and already we see the advantages of thinking in terms of an abstract system, a grammar.

The change in category membership of the English modals explains the catastrophic nature of the change, not in the sense that the change spread through the population rapidly, but that phenomena changed together. The notion of change in a grammar is a way of unifying disparate phenomena, taking them to be various surface manifestations of a single change at the abstract level. Tony Kroch and his associates (see Kroch 1989, for example) have done interesting statistical work on the spread of such changes through populations of speakers, showing that it is grammars which spread: competing grammars may coexist in individual speakers for periods of time. They have shown that the variation observed represents oscillation between two fixed points, two grammars, and not oscillation in which the phenomena vary independently of each
other.

We do not appeal to historical forces as explanations under the cognitive view of grammars. The cause of the grammatical change can only be earlier changes in PLD. There were two. First, the modal auxiliaries became distinct morphologically, the sole surviving members of the preterite-present class of verbs. There were many verb classes in early English and the antecedents of the modern modals were preterite-presents. The preterite-presents (so-called because their present tense forms had past tense or "preterite" morphology) were distinct in that they never had any inflection for the third person singular, although they were inflected elsewhere: *pu cannot, we cunnan, we cudon. Nonetheless, they were just another class of verbs, one of many, and the forms that were to become modal auxiliaries belonged to this class, along with a number of other verbs which either dropped out of the language altogether or were assimilated to another more regular class of verbs. For example, unnan ‘grant’ was lost from the language and witan ‘know’ simply dropped out of the preterite-present class, coming to be treated like non-preterite-presents. After the simplification of verb morphology, verb classes collapsed and the only inflectional property of present-tense verbs to survive was the -s ending for the third person singular, and the preterite-present verbs had always lacked that property. The preterite-presents did not change in this regard, but a great mass of inflectional distinctions had disappeared and now the preterite-presents were isolated; they looked different from all other verbs in lacking their one morphological feature, that -s ending. And the surviving preterite-presents were the elements which would be recategorized as Inflectional items.

The morphological distinctiveness of the surviving preterite-presents, the new modals, was complemented by a new opacity in their past tense forms. The past tense forms of the preterite-present verbs were phonetically identical in many instances to the subjunctive forms and, when the subjunctive forms were lost, past tense forms survived with subjunctive-type meanings rather than indicating past-time reference. While loved is related to love pretty much exclusively in terms of time reference in present-day English, the relationship between can and could is sometimes one of time (12.a) and sometimes has nothing to do with time (12.b). And might is never related to may in terms of time in present-day English (13.a,b); in earlier times, might did indicate past time (13.c) - but the thought of 13.c would need to be expressed as might not have intended in present-day English. So might, could, should, etc. came to take on new meanings which had nothing to do with past time, residues of the old subjunctive uses; the past tense forms became semantically opaque.

12.a. Kim could understand the book, until she reached page 56.
   b. Kim could be here tomorrow.
   b. Kim may/might read the book tomorrow.
   c. These two respectable writers might not intend the mischief they were doing. 1762 Bp Richard Hurd, *Letters on Chivalry and Romance* 85.

As a result of these two changes, the preterite-present verbs came to look different from all other verbs in the language: they were morphologically distinct and had become semantically opaque. UG provides a small inventory of grammatical categories and elements are assigned to a category on the basis of their morphological and distributional properties. Consequently, morphological changes entail new primary linguistic data and they may trigger new category distinctions. In this case, we know that, following the morphological changes, the surviving
verbs of the preterite-present class were assigned to a new grammatical category, and that change was complete by the early sixteenth century. The evidence for the new category membership is the simultaneous loss of the phenomena we discussed in 2-6.a.

There were two stages to the history of English modal auxiliaries (Lightfoot 1999: ch.6). First, a change in category membership, whereby *can*, etc ceased to be treated as verbs and came to be taken as manifestations of the Inflection category; this change affected some verbs before others, but it was complete by the sixteenth century. For a sentence like *Kim can sing*, early grammars had structures like 10, where *can* is an ordinary verb which sometimes moves to I, but later grammars had structures like 11, where *can* is a modal, drawn from the lexicon and merged into a structure as an instance of I. As a result, sentences like 2-6.a dropped out of the language and no longer occurred in texts.

Second, English lost the operation moving verbs to a higher Inflection position (e.g. in 10). This change was completed only in the eighteenth century, later than is generally supposed (Warner 1997). At this point, sentences with a finite verb moved to some initial position (14.b) or to the left of a negative (15.b) became obsolete and were replaced by equivalent forms with the periphrastic *do*: *Does Kim understand this chapter?  Kim does not understand this chapter.*

14.a. Can he understand chapter 4?
   b. *Understands he chapter 4?
15.a. He cannot understand chapter 4.
   b *He understands not chapter 4.

Again French differs: finite forms of both *pouvoir* and *comprendre* occur sentence-initially (16) and to the left of a negative (17).

16.a. Peut-il comprendre le chapitre?
   ‘Can he understand the chapter?’
   b. Comprend-il le chapitre?
   ‘Does he understand the chapter?’
17.a. Il ne peut pas comprendre le chapitre.
   ‘He cannot understand the chapter.’
   b. Il ne comprend pas le chapitre.
   ‘He doesn’t understand the chapter.’

Also sentences with an adverb between the finite verb and its complement became obsolete:

*Kim reads always the newspapers* (cf. French *Kim lit toujours les journaux*).

This change has been discussed extensively and Lightfoot (1999: sect 6.3) argues that it was caused by prior changes in PLD, most notably the recategorization of the modal verbs just discussed and the rise of periphrastic *do* forms. These changes had the effect of greatly reducing the availability of the relevant cue, †V, a verb occurring in an Inflection position.

The idea here is that children scan their linguistic environment for structural cues, such as †V or *VP[V DP]* (verb-object order), etc. Cues may be expressed in the utterances they hear. An utterance expresses a cue if, given everything that the child knows so far, it can only be analyzed with that cue present. So if a finite verb is separated from its DP direct object (by a negative particle, adverb or other material), then it must have moved and the only position that a finite verb may move to is the next highest head, necessarily a functional head like I under current assumptions. So 17.a can only be analyzed with the finite verb *peut* moved to some higher functional position. It therefore expresses the †V cue for a child in a French-speaking milieu.
Cues are elements of structure derived from what children hear. Cues are found in the mental representations which result from hearing, understanding and “parsing” utterances. As a child understands an utterance, even partially, she has some kind of mental representation of the utterance. These are partial parses, which may differ from the full parses that an adult has. The learner scans those representations, derived from the input, and seeks the designated cues.

If children acquire their grammars in this cue-based fashion, then they seek the relevant structures and pay no attention to the set of sentences that grammars generate, comparing them to the set of sentences that they have heard. Lightfoot (1999: ch6) discusses the differences between that kind of input-matching and cue-based acquisition.

The two changes discussed so far are related in ways that we now understand: first, the Inflection position was appropriated by a subclass of verbs, the modal auxiliaries and do, and the V-to-I operation (10) no longer applied generally to all tensed clauses. Somewhat later, the V-to-I movement operation was lost for all verbs (other than the exceptional be and have) and I was no longer a position to which verbs might move. The relationship is that the first change dramatically changed the expression of the \( I_V \) cue, leading to the loss of that structure.

A cue is expressed robustly if there are many simple utterances which can be analyzed only as \( I_V \). So, for example, the sentences corresponding to 16 and 17 can only be analyzed by the French child (given what she has already established about the emerging grammar) if the finite verb raises to I, and therefore they express the cue. A simple sentence like Jeanne lit les journaux, ‘Jeanne reads the newspapers,’ on the other hand, could be analyzed with lit raised to I or with the I lowered into the VP in the English style; therefore it does not express the \( I_V \) cue.

Early English grammars raised verbs to I, as in the grammars of modern French speakers, but later grammars did not; the operation was lost at some point. From our perspective, the operation ceased to be cued. The \( I_V \) cue came to be expressed less in the PLD in the light of at least two developments in early modern English.

We have seen that modal auxiliaries, while once instances of verbs that raised to I (10), were recategorized such that they came to be merged into structures as I elements (11); they were no longer verbs, so sentences with a modal auxiliary ceased to include \( I_V \) and ceased to express the cue. Sentences with a modal auxiliary, Kim could not leave, are very common in ordinary speech addressed to young children, and the recategorization meant that they no longer expressed the cue. Sentences of this type existed at all stages of English but they came to be analyzed differently after the change in category membership.

Second, as periphrastic do came to be used in interogatives like Does he understand chapter 4? (cf. 14.b) and negatives like He does not understand chapter 4 (cf. 15.b), so there were still fewer instances of \( I_V \). Before periphrastic do became available, sentences like 14.b and 15.b expressed the \( I_V \) cue. Periphrastic do began to occur with significant frequency at the beginning of the fifteenth century and steadily increased in frequency until it stabilized into its modern usage by the mid-seventeenth century. For every instance of do, there is no verb in I.

By quantifying the degree to which a cue is expressed, we can understand why English grammars lost the V-to-I operation, and why they lost it after the modal auxiliaries were analyzed as nonverbs and as the periphrastic do became increasingly common. Grammars changed as the available triggering experiences, specifically those expressing the cue, shifted in critical ways. With the reanalysis of the modal auxiliaries and the increasing frequency of the periphrastic do, the expression of the \( I_V \) cue in English became less and less robust in the PLD.
There was no longer much in children’s experience which had to be analyzed as \( \text{I}V \), i.e. which required V-to-I movement, given that the morphological I-lowering operation was always available as the default. In particular, common, simple sentences like *Jill left* could be analyzed with I-lowering; meanwhile sentences like *Kim reads always the newspapers* with post-verbal adverbs and quantifiers had to be analyzed with a verb in I, but these instances of the cue were not robust enough to trigger the relevant grammatical property, and they disappeared quickly, a by-product of the loss of the V-to-I operation, a domino effect.

So the expression of the cue dropped below its threshold, leading to the elimination of V-to-I movement. The gradual reduction in the expression of \( \text{I}V \) is not crucial. What is crucial is the point at which the phase transition took place, when the last straw was piled on to the camel’s back. Children scan the environment for instances of \( \text{I}V \). This presupposes prior analysis, of course. Children may scan for this cue only after they have identified a class of verbs and when their grammars have a distinct inflection position, I.

This grammatical approach to diachrony explains changes at two levels. First, the cues postulated as part of UG explain the unity of the changes, why superficially unrelated properties cluster in the way they do. Second, the cues permit an appropriately contingent account of why the change took place, why children at a certain point converged on a different grammar: the expression of the cues changed in such a way that a threshold was crossed and a new grammar was acquired.

An intriguing paper by Anthony Warner (1995) shows that there is a third stage to the history of English auxiliaries, involving changes taking place quite recently affecting the copula *be*, and this turns out to be of current theoretical interest, discussed in Lightfoot 1999: ch7. The changes only involve the verb *be* but they have the hallmarks of grammatical change. There are several surface changes, all involving *be*, which can be attributed to one analytical notion concerning the way that elements are stored in the lexicon. The changes reflect quite general properties of the grammar. One can identify the structural property which is relevant and we can tell a plausible and rather elegant story about why and how the grammatical change might have come about.

That change, which I will not discuss here, is another illustration of the fact that morphology has syntactic effects. It is particularly important in defining category membership; children assign items to categories on the basis of their morphology. While morphology clearly influences category membership, one finds a stronger claim in the literature. It is sometimes argued that richly inflected languages differ in a fundamental, global way from poorly inflected languages like English, Swedish and Chinese. Not many of the world's languages have a richly recorded history, but many that do have undergone morphological simplification, sometimes with category changes. If our historical records included languages with increasing morphological complexity, we would be in a stronger position to relate morphological and categorial changes. For discussion of this intriguing matter, see Lightfoot 2002 and van Kemenade & Los (this volume).

In this section I have tracked some changes affecting the English modal auxiliaries, changes which might be labeled "grammaticalization". We have shown local causes for each of the three changes in grammars (the new category membership of the modal auxiliaries and the loss of V-to-I movement), taking grammars to be individual, internal systems existing in individual brains. There was nothing inevitable about these changes: the equivalent words in French and Swedish did not undergo parallel changes, because there were no parallel local causes.
This case study suggests that category changes may result from morphological changes. Let us now consider another structural change, which is cued by morphological changes in the case system.

4. Syntactic effects of the loss of case.

There is a theory of abstract Case, which determines the positions in which DPs may be pronounced (Anderson & Lightfoot 2002: ch3). DPs occur in positions in which they receive Case: as the subject of a finite clause (They left), as a specifier of a larger DP (Their book), or as a complement to a verb or a preposition (Read them, Look at them). These are positions which typically receive nominative, genitive and accusative cases in languages with morphological case. If a DP is merged into a position where it does not receive Case (for example, as the complement to a noun or adjective or as the subject of an infinitival verb), it must move to a position where it does. Our abstract Case seems to be related to the overt, morphological case studied by earlier grammarians and one can probe that relationship by examining what happens syntactically when a morphological case system is eroded and eventually lost.

In this section I shall examine some curious syntactic effects resulting from the disappearance of the morphological case system in English. The loss of morphological case will enable us to understand to a significant degree the hitherto mysterious emergence of new "split genitives" in Middle English. What is striking is the tightness of the explanation, the way in which one element of Case theory explains the details of the development. We shall see that if one part of a child's linguistic experience changes, namely the case morphology, then other things must also change in the grammars which emerge (Lightfoot 1999: ch5).

The Case theory I adopt links Case to thematic roles: there is a one-to-one relationship in ways which will become clear, and it is a single fact that a verb like go does not assign Case or a thematic role. Thematic roles define the semantic relationship of DPs to a head. In 18.a the subject DP is an Agent, a Theme in 18.b, a Location in 18.c, and an Instrument in 18.d. These thematic roles are a function of the meaning of the verb and are "assigned" by the verb, so the DPs are thematically linked to the verbs. In a sentence like Kay drove to NY, NY is thematically linked to the preposition to and not to the verb drove; in a phrase John’s mother’s house, the DP John’s mother is thematically related to house but the smaller DP John is thematically related only to mother.

18.a. DP[The striker] kicked the defender.

b. DP[The striker] received the award.

c. DP[The Indian Ocean] surrounds Madagascar.

d. DP[The wind] blew the door open.

If UG stipulates that heads may assign Case to the left or to the right in accordance with the order of heads, one is not surprised to find Old English (OE) nouns assigning Case to the left and to the right. There is good reason to believe that the order of heads was shifting in late OE: one finds verbs preceding and following their complement, object-verb order alternating with verb-object. There is independent evidence that OE nouns assigned genitive Case not only to the left (19.a) but also to the right (19.b). One finds genitive-head order alternating with head-genitive. OE has a very simple analysis. It is more or less a direct manifestation of this UG theory of Case: nouns assigned Case to the left and to the right, and only to DPs with which they were thematically related, as we shall see. Case was assigned in that fashion and then was
REALIZED on both sides of the N with the morphological, genitive suffix.

19.a. Godes lóf 'praise of God' (Ælfric)
   Cristes læwa 'betrayer of Christ'
   b. Lufu godes and manna 'love of God and of men' (Ælfric, Catholic Homilies ii. 602.12).
   Ormæte stream waṭeres 'huge stream of water' (Ælfric, Catholic Homilies ii. 196.5)

If OE nouns assigned Case to the left and to the right, and if in both positions it was realized as a morphological genitive, then one is not surprised to find that OE also manifested "split genitives". They were split in that a single genitive phrase occurred on both sides of the head noun. In 20 we see an example where the split element occurring to the right of the noun was a conjunct. Jespersen (1909: 300) notes that with conjuncts, splitting represents the usual word order in OE.

   Inwær's brother and Healfden's
   'Inwær's and Healfden's brother.'
   b. Sodoma lande 7 gomorra. West Saxon Gospels (Ms A), Matt 10.15.
   'The Sodomites' and the Gomorreans' land.'

In addition, appositional elements, where two DPs are in parallel, were usually split: the two elements occurred on either side of the head noun (21.a-c), although 21.d was also possible, where Ælfredes cyninges is not split.

   'King Alfred's godson.'
   b. Þæs cyninges dagum herodes. West Saxon Gospels (Ms A), Matt 2.1.
   'In the days of Herod the king.'
   c. Iohannes dagum fulwihteres. West Saxon Gospels (Ms A), Matt 11.12.
   'From the days of John the Baptist.'
   d. Ælfredes cyninges godsunu. AS Chron. 890 (Parker c900).
   e. *The book's cover about Rio (= 'The book about Rio's cover')
   f. *Þæs cyninges godsune Frances, The king's godson of France (= 'The king of France's godson')

Splitting within DPs was restricted to conjuncts (20) and to appositional elements (21.a-c). In particular, OE did not show split constructions with a preposition phrase, along the lines of 21.e. So there was no general rule "extraposing" a PP. Nor does one find anything like 21.f, where Frances has no thematic relation to godsune.

Split genitives in OE had a structure along the lines of 22. Ælfredes was in the specifier of DP. Godsune assigned a thematic role and Case to the left and to the right (Allen 2002 argues that cyninges is an adjunct to godsune, not a complement).

22. $D_P[ Spec[Ælfredes] D_NP[ s_godsune [cyninges]]$

These grammars had an overt genitive case on the right or on the left of the head noun; and they had split genitives, where the head noun assigned the same thematic role and Case in both directions. So much for splitting in OE grammars.

Now for the mysterious changes. Middle and early Modern English also manifested split genitives but they included forms which are very different from the split genitives of OE, as the examples of 23 show.


The meaning is 'The clerk of Oxford's tale,' 'King Priam of Troy's son,' etc, and the genitive is split: the rightmost part of the genitive phrase (italicized) occurs to the right of the head noun which the genitive phrase modifies. Mustanoja (1960: 78) notes that 'the split genitive is common all through ME' and is more common than the modern "group genitive," *The clerk of Oxford's tale*. Jespersen (1909: 293), exaggerating a little, calls this splitting 'the universal practice up to the end of the fifteenth century.' However, these ME split forms are different from those of OE grammars, because the rightmost element is neither a conjunct nor appositional, and it has no thematic relation with the head noun, *tale, son, Grace*.

We can understand the development of the new ME split genitives in light of the loss of the overt morphological case system and the theory of Case related to thematic role (Culicover 1997: 37f discusses the 'thematic case thesis', under which abstract Case realizes thematic-role assignment quite generally). This is where we can connect work on abstract Case with the morphological properties discussed by earlier grammarians.

OE had four cases (nominative, accusative, genitive, and dative) and a vestigial instrumental, but they disappeared in the period of the tenth-to-thirteenth century, the loss spreading through the population from the north to the south - probably under the influence of the Scandinavian settlements (O'Neil 1978). In early ME, grammars emerged which lacked the morphological case properties of the earlier systems, in particular lacking a morphological genitive.

Put yourself now in the position of a child with this new, caseless grammar; your grammar has developed without morphological case. You are living in the thirteenth century; you would hear forms such as 21.a *Ælfredes godsune cyninges*, but the case endings do not register - that's what it means not to have morphological case in one’s grammar. You are not an infant and you are old enough to have a partial analysis, which identifies three words. *Ælfredes* was construed as a "possessive" noun in the specifier of DP.

The modern "possessive" is not simply a reflex of the old genitive case. Morphological case generally is a property of nouns. On the other hand, "possessive" in modern English is a property of the DP and not of nouns: in 24.a *My uncle from Cornwall's cat* the possessor is the whole DP *My uncle from Cornwall*. Allen (1997) shows that the 's is a clitic attached to the preceding element and that the group genitive, where the clitic is attached to a full DP, is a late ME innovation.

24.a. _dp[my uncle from Cornwall]'s cat_  
   b. Paines his brother (Shakespeare, *2 Henry IV* 2.4.308)  
      For Jesus Christ his sake (*1662 Book of Common Prayer*),  
   c. Mrs. Sands his maid (OED, 1607)  
   d. Job's patience, Moses his meekness, and Abraham's faith (OED, 1568)

As the case system was lost, the genitive ending -es was re-analyzed as something else, a Case-marking clitic. If 's comes to be a clitic in ME, which Case-marks DPs, this would explain why "group genitives" begin to appear only at that time, as Allen argued.

It is likely that there was another parallel reanalysis of the genitive -es ending, yielding the *his*-genitives which were current in the sixteenth and seventeenth centuries (24.b) for 'Paines'
brother,' 'Jesus Christ's sake,' etc. The genitive ending in -s was sometimes spelled his, and this form occurs even with females (24.c) and occurs alongside possessive clitics (24.d).

UG dictates that every phonetic DP has Case. The new caseless children reanalyzed the old morphological genitive suffix -es as a clitic, which was recruited as a Case-marker. The clitic 's Case-marks the element in the specifier of the containing DP. So Ælfred has Case and the Case is realized through the 's marker (usually analyzed as the head D, as in 25.a'). In short, the Ælfredes of the parents is re-analyzed as Ælfred's (25.a), although orthographic forms like Ælfredes occur in texts when mental grammars surely yielded Ælfred's. Orthographic 's is a recent innovation.

So now what about cyninges in 21.a? The evidence suggests that the phrase became 25.a Ælfred's godsune king. One finds phrases of just this form in 25.b,c, where the postnominal noun is not overtly Case-marked, and Jespersen (1909: 283-4) notes that these forms are common in ME.

25a. Ælfred's godsune king
   a'. DP[DP[Ælfred] D's[Ælfred's] NP[godsune [king]]]
       'Pharaoh the king's dream.'
       'Sinon the Greek's horse.'

The forms of 25, where the rightmost element is appositional, are direct reflexes of OE split genitives like 21, corresponding exactly, except that the split element, Pharao, Synoun, has no overt case. Despite the absence (for us new, caseless children - remember our thought experiment) of an overt, morphological genitive case, UG prescribes that the postnominal DP must carry some abstract Case. After the loss of the morphological case system, it can no longer be realized as a genitive case ending. That means that there must be another way of marking/realizing the abstract Case in 25. Perhaps Pharao receives its Case by coindexing with the Case-marked kynges; the two forms are in apposition and therefore are coindexed and share the same thematic role. This is what one would expect if there is a one-to-one relationship between Case and thematic role, the key element of the theory of Case adopted here. In that event, no independent Case-marker is needed for Pharao.

There is another option for realizing Case on the rightmost element. The dummy preposition of could be used as a Case-marker, as it is in 23. This is not possible in Ælfred's godsune king or the phrases of 25, because if of were to Case-mark the DP, one would expect it also to assign a thematic role (given a one-to-one relation between Case and thematic role) and in that event the DP could not be interpreted as an appositional element. The sentences of 23, on the other hand, are not like those of 25 and have different meanings. In 23.b, for example, Wive and Bath are not appositional, not coindexed, and therefore an independent Case-marker and thematic-role assigner is needed; this is the function of of. Under this view, the emergence in ME of the new N of DP forms (23) is an automatic consequence of the loss of the morphological case system: of was introduced in order to Case-mark a DP which would not otherwise be Case-marked. In particular, the DP could not be Case-marked like the rightmost item in 25, which carries the same Case as Ælfred's because it has the same thematic role. Of assigns Case to a DP only if it has an independent thematic role.

With the introduction of the of Case-marker in these contexts, there is a further change and the
split genitive construction is extended, as noted (23). In OE, the postnominal genitive always had a thematic relation with the head noun; one does not find expressions such as 21.f Ælfræd's cyninges son Frances 'The king of France's son,' where Frances is neither a conjunct nor appositional and is thematically related to 'king' (Nunnally 1985: 148, Cynthia Allen, Willem Koopman, personal communication). In such a phrase, Frances could not be Case-marked by any adjacent element; in particular, it could not receive Case from son because it has no thematic relation with son. In ME, one does find postnominal, split DPs even where there is no thematic relation with the head noun, and the postnominal items are Case-marked by of. So, in 23.a Oxenford is construed with clerkes and not with tale, and it is Case-marked by of. It is crucial to note that the ME split expressions only involve of phrases: one does not find The book's cover about Rio for 'The book about Rio's cover,' mirroring the situation in OE and showing that there is no general operation "extraposing" PPs in ME, any more than there was in OE. Additionally, - and this is crucial - the postnominal noun in 23 always has a thematic role of Locative/Source. I know of no claim to this effect in the literature but it has been pointed out by Cynthia Allen, Olga Fischer, and Willem Koopman in independent personal communications and it seems to be right. So, for example, one does not find forms like 26, where the postnominal noun is a Theme (26.a) or a Possessor (26.b).

26.a. The portrait's painter of Saskia (= the portrait of Saskia's painter)
   b. The wife's tale of Jim (= the wife of Jim's tale)

The fact that the of phrase is associated with a unique thematic role makes sense if UG prescribes a link between Case and thematic-role assignment. As we have noted, in OE (21.a) Ælfræd's godsune cyninges, godsune assigns the same Case to the right and to the left, realized in both instances as an overt, morphological genitive case; it also assigns the same thematic role to the two DPs to which it assigns Case. That is what it means for the two DPs to be appositional (same Case, same thematic role), and all of this is easy to understand if Case and thematic-role assignment are linked at the level of UG. Likewise for conjuncts (20). Consequently, the extension of these split genitives in ME (to the new forms with of - 23) is not surprising under a theory which allows nouns to assign Case and which links Case to thematic-role assignment.

This much we can understand under the theory of Case. The properties of the new grammar must have emerged in the way that they did, if children (a) heard expressions like Ælfræd's godsune cyninges (21.a), (b) did not have the morphological case system of their parents, and (c) were subject to a Case theory requiring all DPs to have Case (assigned and realized) and linking Case with the assignment of thematic roles. We have a tight explanation for the new properties of ME grammars. In particular, we explain the distinction between 23 and 25, of occurring where there is no thematic relation with the head noun (23), but not where there is such a relation (25). We see that change is bumpy; if one element of a grammar changes, there may be many new phenomena (23). Children do not just match what they hear and they may produce innovative forms, as required by UG. UG defines the terrain, the hypothesis space, and a change in initial conditions (loss of morphological case) may have syntactic effects.

This is an explanation for the form of the split genitives of 23 in ME. They were around for four centuries and then dropped out of the language. This was probably a function of the newly available clitic 's which made possible group genitives like The clerk of Oxford's tale; these became possible only when 's was construed as a clitic, which Case-marked DPs, and that in turn
was a function of the loss of morphological cases, including the genitive in -es.

Here I have taken a notion from traditional grammar and construed Case as an I-language element. Phonetic DPs, DPs which are pronounced, have an abstract Case which must be realized somehow. This is a function of UG and abstract Cases are often realized as morphological cases. Children scan their linguistic environment for morphological cases and, if they find them, they serve to realize abstract Cases. If children do not find morphological cases, then different grammars emerge. In that event, a P or V (or other categories) may Case-mark a complement DP. We have examined here what happens when everything else remains constant. There came a point in the history of English when children ceased to find morphological cases. Those children were exposed to much the same linguistic experience as their parents but the transparency of overt case endings had dropped below a threshold such that they were no longer attained. Given a restrictive theory of UG, one linking Case-assignment by nouns to thematic-role assignment and requiring Cases to be realized on phonetic DPs, other things then had to change.

In this way our abstract theory of Case and our theory of cue-based acquisition enables us to understand how some of the details of ME grammars were shaped, why things changed as they did and why ME grammars had their odd split genitives.

5. Results.

The emergence of a grammar in a child is sensitive to the initial conditions of the primary linguistic data. Those data might shift a little, because people came to use their grammars differently in discourse, using certain constructions more frequently, or because the distribution of grammars had shifted within the speech community. In that case, there may be significant consequences for the abstract system. A new system may be triggered, which generates a very different set of sentences and structures. Contingent changes in the distribution of the data (more accurately, changes in the expression of the cues) may trigger a grammar which generates significantly different sentences and structures, and that may have some domino effects.

Changes often take place in clusters: apparently unrelated superficial changes occur simultaneously or in rapid sequence. Such clusters manifest a single theoretical choice which has been taken differently. If so, the singularity of the change can be explained by the appropriately defined theoretical choice. So the principles of UG and the definition of the cues constitute the laws which guide change in grammars, defining the available terrain. Any change is explained if we show, first, that the linguistic environment has changed and, second, that the new phenomenon (may, must etc being categorized as I elements, for example) must be the way that it is because of some principle of the theory and the new PLD.

Sometimes we can explain domino effects. Loss of inflectional markings had consequences for category membership and changes in category membership had consequences for computational operations moving verbs to a I position. In that event, one establishes a link between a change in morphological patterns and changes in the positions of finite verbs.

Historical change is a kind of finite state Markov process, where each state is influenced only by the immediately preceding state: changes have only local causes and, if there is no local cause, there is no change, regardless of the state of the grammar or the language some time previously. In that way, the emergence of a grammar in an individual child is sensitive to the initial conditions, to the details of the child's experience. The historian's explanations are based
on available acquisition theories, and in some cases our explanations are quite tight and satisfying. Structural changes are interesting precisely because they have local causes. Identifying structural changes and the conditions under which they took place informs us about the conditions of language acquisition; we have indeed learned things about properties of UG and about the nature of acquisition by the careful examination of diachronic changes. So it is if we focus on changes in grammars, viewed as biological entities, and we gain a very different approach to language change than the ones which focus on E-language phenomena, on the group products of cognitive systems rather than on the systems themselves.

Linking language change to the acquisition of grammars in this fashion has enabled us to understand certain grammars better and has refined UG definitions. It has also been the source of two fairly fundamental notions: the idea of coexisting grammars and internal diglossia, whereby apparent optionality can be viewed as the effects of speakers using more than one grammar (Kroch 1989); and the idea that the PLD consist of structures instead of sets of sentences (Lightfoot 1999).

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**Suggested reading**
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