STUDIES IN THE EVOLUTION OF LANGUAGE

General Editors
James R. Hurford, *University of Edinburgh*
Frederick J. Newmeyer, *University of Washington*

This series provides a forum for work in linguistics and related fields that seeks answers to questions about the origins and evolution of language. It places a premium on sound scholarship, rational thought, and readable writing.

PUBLISHED

The Transition to Language
Edited by Alison Wray

The Origins of Vowel Systems
Bart de Boer

PUBLISHED IN ASSOCIATION WITH THE SERIES

Language Diversity
Daniel Nettle

Function, Selection, and Innateness:
The Emergence of Language Universals
Simon Kirby

The Origins of Complex Language:
An Inquiry into the Evolutionary Beginnings of Sentences, Syllables, and Truth
Andrew Carstairs-McCarthy

IN PREPARATION

Language Evolution:
The States of the Art
Edited by Morten Christiansen and Simon Kirby

The Transition to Language

Edited by
Alison Wray

OXFORD
UNIVERSITY PRESS

17 Uniformitarian Assumptions and Language Evolution Research

FREDERICK J. NEWMEYER

17.1 Introduction

This chapter explores the consequences of the fact that most research into language origins and evolution has taken the 'uniformitarian' position that the general nature of human language has not changed much over the millennia. It concludes that such a position is probably a mistaken one. The chapter is organized as follows. Section 17.2 presents the evidence for uniformitarianism, at least in so far as it governs the languages spoken today. Section 17.3 documents the fact that most language evolution research has assumed the correctness of the principle diachronically, as well as synchronically. Section 17.4 presents reasons to doubt the correctness of uniformitarianism, at least in its strongest form and sect. 5 argues that reasons for such doubt increase the further back we go in time.

17.2 Uniformitarianism in Linguistics

If one quotation captures the essence of twentieth-century linguistics, it would have to be the following from Edward Sapir: 'When it comes to linguistic form, Plato walks with the Macedonian swineherd, and Confucius with the head-hunting savage of Assam' (Sapir 1921: 219). The sentiment expressed, namely that all languages are in some important sense equal, informed most of the linguistic theory carried out in the last century and it looks set to continue to be the bedrock of theorizing in this one.

In what way have languages been considered to be equal? Well, in almost *every* way. First and foremost, linguists have rejected the idea, prevalent throughout most of the nineteenth century, that one language can be charac-

terized as 'more primitive' or 'more advanced', grammatically speaking, than another. By the 1920s, if not earlier, it had become apparent that grammars of all languages are composed of the same sorts of units—phonemes, morphemes, and so on—and therefore all grammars can be analysed by means of the same theoretical tools. As far as bearing on the correct theory of grammar is concerned, a vowel alternation in English is no more or no less relevant than one in Sierra Popoluca.

Furthermore, since the oldest languages that we have on record—the earliest samples of Babylonian, Chinese, Greek, and so on—manifest the same grammatical devices as modern languages, one has typically concluded that there is no overall *directionality* to language change. That, is, human languages have always been pretty much the same in terms of the typological distribution of the elements that compose them.

I will call the conjunction of positions outlined in the previous two paragraphs the 'uniformitarian hypothesis'. This hypothesis has had the very happy consequence of being both evidently factually correct and politically desirable. As far as 'factually correct' is concerned, little needs to be said. Hundreds of languages have been described for the first time since Sapir's statement in 1921. While theories of grammar have changed enormously since then, no language has been encountered with grammatical properties so unusual as to defy the possibility of description within existing theoretical frameworks or within a modest extension of such frameworks. And as far as 'politically desirable' is concerned, little *should* need to be said. If all humans are, at root, the same, then we would expect all their languages to be, at root, the same. All languages are products of the same mind and body.

Uniformitarianist assumptions helped clear the air of nineteenth-century race theories and, as formulated by Sapir's teacher Franz Boas, were a powerful weapon against the various twentieth-century attempts to link race, intelligence, and inherent ability. It is no accident, then, that in the period between the two world wars the governments that condemned structural linguistics outright were fascist Germany and Italy and (for somewhat different reasons) Stalinist Russia (for discussion, see Newmeyer 1986).

Most linguists today are so wedded to uniformitarian assumptions that they hold an even stronger version of the hypothesis than that characterized . above. Namely, they maintain that for any given language, there is no correlation between aspects of that language's grammar and properties of the *users* of that grammar. That is, there is no correlation between the grammar of a particular language and the culture, personality, world-view, and so on

of the speakers of that language. Again, such a view has a great deal to recommend it. Nineteenth-century historical and comparative linguistics took a qualitative leap forward when researchers stopped trying to link sound changes to the presumed national characteristics of the speakers of the languages undergoing the changes and (a little later) when they stopped trying to correlate grammatical (typically, morphological) properties with racial and cultural characteristics.

In fact, virtually all linguists today would agree that there is no hope of correlating a language's gross grammatical properties with sociocultural facts about its speakers. For example, some languages manifest distinctive phonological tone, others do not. As (1) illustrates, it would be hard to 'link' distinctive tonality to anything external:

(1) | *Distinctive tone* | *No distinctive tone* |
     | --- | --- |
     | Chinese | Korean |
     | Navajo | Hopi |
     | Kikuyu | Swahili |
     | Ewe | Wolof |

Languages can also be typologized in terms of the predominant ordering of the verb (V), the subject (S), and the object (O) within the clause. Example (2) illustrates the evident lack of sociocultural implications of the choice of word order:

(2) SVO: English and Zulu
     SOV: Japanese and Siouan
     VSO: Welsh and Quileute

As a final example, consider the property of 'ergativity'. Languages fall roughly into two classes. In nominative–accusative languages, like English, subjects of intransitive and subjects of transitive verbs have the same (nominative) case marking:

(3) Nominative–Accusative Languages:
     Mary-NOM ran
     Mary-NOM threw the ball-ACC

But in ergative–absolutive languages, the subjects of intransitive verbs and the objects of transitive verbs are marked the same. Subjects of transitive verbs have distinctive ergative case marking:

(4)   Ergative–Absolutive Languages:

Mary-ABS ran

Mary-ERG threw the ball-ABS

As (5) illustrates, one would be hard pressed to correlate ergativity with properties of language users:

(5)   *Nominative–Accusative*   *Ergative–Absolutive*

Spanish   Basque

Armenian   Chechen

Hawaiian   Samoan

Mangarayi   Dyirbal

Now, interestingly, the extension of uniformitarianism to the denial of links between language, culture, and world-view was manifestly not Sapir's position. Indeed, he believed strongly that such links exist. Such a belief even has his name enshrined in it: the Sapir–Whorf Hypothesis. Sapir believed that the structure of one's language directly shapes one's view of the world, and that different structures impose on the consciousness a different perception of reality:

Language actually defines experience for us by reason of its formal completeness and because of our unconscious projection of its implicit expectations into the field of experience ... Such categories as number, gender, case, tense are not so much discovered in experience as imposed upon it because of the tyrannical hold that linguistic form has upon our orientation in the world.   (Sapir 1931: 578)

Sapir's student Benjamin Whorf wrote several articles (collected in Carroll 1956) on how the Hopi's non-Indo-European style system of tenses was at the root of their (supposedly) not having any sense of time as a smooth flowing continuum. Other works in this genre—some by highly regarded linguists—have correlated the Navajo set of movement affixes to their nomadic lifestyle (Hoijer 1964) and the Papago number system to the seeming inability of speakers of Papago to make black-or-white decisions (Mathiot 1964). Mathiot notes that the number system of this language is strikingly different from that of English. Number in Papago is relativistic—their language forces them to specify whether there are more or fewer objects at some particular place than expected. This fact, she concludes, has helped to determine that 'Papago perception and behavior are along a sliding scale rather than in terms of a two-valued logic' (p. 160).

It seems safe to state that few theoretical linguists today attach much

intellectual value to such ideas. Inevitably, the methodology that led to the conclusions was shoddy, the claims were for the most part untestable, and, where they were tested, they turned out to be simply wrong. In fact, most linguists today regard semantic representations as universal. Such a view, as noted in Bach (1968: 122), constitutes an implicit denial of the Sapir–Whorf hypothesis.

17.3   Uniformitarianism and the Field of Language Evolution Research

Let us now turn to the question of the origins and evolution of language. Uniformitarian assumptions have, in general, been carried over into research on this topic. Specifically, most scenarios of language evolution take uniformitarianism for granted in that they equate the origins of human language with whatever genetic event created human beings. The implication, of course, is that, at least in its grammatical aspects, language has not changed a great deal since that event. Let us now look at the remarks made on this topic by prominent grammarians.

It is well known that Chomsky has been reluctant to speculate on language origins. But what he has said implies that with humans, you get human language. Along these lines, he has written: 'Perhaps [the properties of Universal Grammar] are simply emergent physical properties of a brain that reaches a certain level of complexity under the specific conditions of human evolution' (Chomsky 1991: 50). There is little room for a non-uniformitarian development of the language faculty in such a big-bang scenario.

Robert Berwick, in a specifically minimalist-program oriented approach to language origins, also rejects the idea that human language could ever have been more primitive. As he notes: 'there is no possibility of an 'intermediate' *syntax* between a non-combinatorial one and full natural language—one either has Merge in all its generative glory, or one has no combinatorial syntax at all' (Berwick 1998: 338–9).

Other scholars—most notably Derek Bickerton and Andrew Carstairs-McCarthy—have put forth detailed explicit scenarios on the origins of human grammar. Both point to stages where our ancestors had something more primitive than modern human language. But significantly, it was *Homo erectus*, not *Homo sapiens* that had this more primitive syntax. Bickerton (1990) sees human language as the product of a two-stage process.

The first took place with the rise of *erectus*, approximately 1.6 million years ago. *Erectus* developed protolanguage, a mode of linguistic expression that attaches vocal labels to pre-existing concepts. Protolanguage is quite different from language in a number of respects. First, protolanguage lacks a true syntax. The order of elements in an utterance is determined by the pragmatics of the speech event. Second, it lacks null elements such as traces and null pronominals. Third, predicates do not subcategorize for obligatory arguments. Fourth, recursion is absent. And fifth, there are no grammatical items (i.e. inflections, complementizers, conjunctions, and so on), or at least there are very few of them. A single mutation, coincident with the transition from *erectus* to *sapiens*, created true language from protolanguage. The major linguistic consequence of this mutation was the imposition of recursive hierarchical structure on pre-existing thematic structure, in one swoop transforming protolanguage into true modern human language. However, in his subsequent book (Bickerton 1995), the effects of the mutation are far less evolutionarily catastrophic, in that he explicitly separates out the mutation involved in the linking of pre-existing cognitive subsystems involved in syntax with the other anatomical changes relevant to our full repertoire of linguistic abilities. And Bickerton (1998) posits the single-step creation of a new neural pathway linking thematic structure (now regarded as itself a product of primate reciprocal altruism) and phonetic representation, rather than an actual mutation. Nevertheless, in all three scenarios human language was 'complete' with the birth of the species.

Carstairs-McCarthy (1999) posits a far richer syntax for *erectus* than does Bickerton, but in his view as well, the capstone of modern language—the recursive feature of syntax—comes in with *sapiens* (ibid. 191). In other words, for both Bickerton and Carstairs-McCarthy, uniformitarian assumptions hold throughout the history of *Homo sapiens*.

Computer simulations of the evolution of language have tended to build in uniformitarian assumptions in a rather different way. Consider, for example, Kirby (1998). This work presupposes the performance theory motivated in Hawkins (1994), which sees pressure to identify phrasal and sentential constituents as rapidly as possible as the central force affecting syntactic structure. In one simulation he starts with a hypothetical speech community in which verb–object order and adposition order are 'dysfunctionally' associated. In the course of the simulation, the populations come to converge on the orders preferred by Hawkins's theory, namely, verb–object and prepositional, and object–verb and postpositional. Kirby's take

on Hawkins is a thoroughly uniformitarian one. He does not consider the possibility that at an earlier stage of human language, parsing pressure might have been overshadowed by other pressures. If such had been the case, then the typological distribution of grammatical properties would have looked rather different. (See also Tonkes and Wiles, in this volume, which partially replicates Kirby's study.)

In the remainder of this chapter I will first review the evidence for the proposition that, based on existing languages and those for which we have historical records, the strongest form of uniformitarianism might not be correct. I will then go on to discuss how uniformitarian assumptions must almost *surely* be wrong if we expand our time-frame to the whole of human history.

17.4 Some Doubts about the Correctness of Uniformitarianism

There has always been some linguistically informed opposition to uniformitarianism. The bulk of the scepticism that this principle might not be fully correct derives from the very real possibility that there is some overall directionality to language change. That is, using traditional terminology, there is some evidence to support the idea that languages as a whole are 'drifting' in a particular direction. The most frequently encountered claim along these lines is that there has been an overall drift from verb-final to verb-medial order. A dozen different scholars for a dozen different reasons have suggested that verb-final languages are more likely to develop into verb-medial languages than vice versa, suggesting a progressive decline in the overall percentage of verb-final languages (see e.g. Vennemann 1973; Li 1977; Givón 1979; Bichakjian 1991; Bauer 1995; Beaken 1996; Aske 1998; Newmeyer 2000). If such a view is correct, then the typological distribution of grammatical elements must have looked quite different ten, fifty, and a hundred thousand years ago than it does today.

A non-uniformitarian phonological scenario is put forward in Comrie (1992), where it is argued that certain complexities of modern language were not present in the earliest human languages, but arose over historical time. These include morphophonemic alternations (e.g. sound alternations such as we find in *electric* [k] v. *electric* [s] *-ity*), phonemic tone and vowel nasalization, and fusional morphology. Hombert and Marsico (1996) come to the same conclusion. In their view, complex vowel systems are fairly recent

historical developments. In particular, they present evidence that seems to suggest that front rounded vowels and nasalized vowels have shown a tendency to increase over the centuries; few reconstructed proto-systems show any evidence of having had them.

Heine and Kuteva (this volume) suggest that the changes that go under the heading of 'grammaticalization' might suggest a non-uniformitarian development of language. Most researchers of this topic (see e.g. Heine *et al.* 1991; Hopper and Traugott 1993), basing their conclusions on internally reconstructed evidence, posit a unidirectional change over time from 'less grammatical' morphosyntactic elements to 'more grammatical' ones, as indicated below:

(6)   lexical categories > functional categories and pronominal elements > clitics > derivational affixes > inflectional affixes > zero

As a simple illustration, *have* in English has developed from a full verb expressing physical possession ('to hold in one's hand') to an auxiliary-like element expressing simple intention to perform an act to an even further reduced clitic form.

Given the unidirectionality of grammaticalization changes, Heine and Kuteva tentatively suggest that the earliest human language might have had lexical categories (nouns and verbs), but no functional categories or affixes. However, they recognize a problem inherent in such a conclusion. The entire progression from full lexical category to affix can take fewer than 2,000 years to run its course. As they note, if there were no processes creating new lexical categories, we would be in the untenable position of saying that languages remained constant from the birth of *Homo sapiens* until a couple of millennia ago, at which point the unidirectional grammaticalization processes began.

What about the shibboleth that grammar and culture are independent? Even here and even looking at the languages spoken today, there is room for doubt as to its total correctness. For example, Perkins (1992) argues that the more complex the culture, the less complex the grammatical system for expressing deixis. Perkins maintains that while European languages may have words for expressing the concepts 'this', 'that', and (possibly) 'that over there', languages spoken by hunter-gatherers tend to have vastly more ways of expressing deictic concepts. In a less ambitious study, Webb (1977) argues that the transitive use of 'have' (as in *I have a car*) is correlated with ownership of property.

Interestingly, quite a few studies have tied properties of language structure to the degree of isolation of the speakers of the language or the amount of contact that speakers have with speakers of other languages. Trudgill (1992), for example, has argued that the languages of small isolated communities tend to have distinctive typological features. For example, they tend to be over-represented by grammatical constructs that pose difficulty for non-native speakers, such as complex inflectional systems, characterized by multiple paradigms for each grammatical class. They also tend to manifest the sorts of features that one might expect to be present in a tight social network, such as weird rules with enough exceptions to mystify non-native learners.

Nettle (1999), by means of computer simulations, has come to very much the same conclusion. His simulations predict that small communities will have languages with more marked structures than will large communities. For example, small-group languages are more likely to have object-initial orders and big segment inventories. Interestingly, these results suggest an alternative explanation to that put forward in Nichols (1990, 1992) for why there is more linguistic diversity in the New World than in the Old World. This fact falls out from the circumstance that linguistic communities in the former tend to be smaller than those in the latter.

There is also the question of language *contact* and its consequences for grammars. In fact, there is no consensus on this point. Trudgill, pointing to pidgins and creoles as support for his position, argues that contact that primarily involves adults leads to simplification of grammars. On the other hand, when whole societies interact, grammatical complications tend to result. By way of example he cites the borrowing by the southern Bantu languages of click sounds from the Koi-San languages with which the Bantus came into contact.

It is not clear that things are as simple as Trudgill would have them. Similar contact situations, it would seem, can lead to either simplification or complication. For example, consider the history of English. The prevalent view (see O'Neil 1978) is that the contact between Old Norse and Old English led to the simplification of the latter, in particular to the loss of its complex case system. On the other hand, contact between English and French a few centuries later led to complication. As words flooded into English from French, the moderately simple Latin and Old French word stress system was superimposed on the very simple Old English word stress system, leading to a 'synthesis' (if that is the right word) that was vastly more complicated than

either. So it is not clear if there is some overarching generalization as to the relationship between contact and consequences for the grammar.

To complicate matters still further, Dixon (1997) has suggested a model of language change that leads to the conclusion that the typological features characterizing the differences between groups in occasional contact with each other tend to become smaller over time. His model of 'punctuated equilibrium' sees as the norm the diffusion of features across many areas. For Dixon, rapid language change is modellable by classical family trees only when there is dramatic upheaval.

A well-known non-uniformitarian account of language change has been put forward in Givón (1979). He has argued for a transition over time from discourses characterized by a 'pragmatic mode' to those characterized by a 'syntactic mode'. The former, pragmatic, mode employs topic-comment structure, loose conjunction, word order being governed by pragmatic principles, lack of morphology, stress-marked focus, and so on. The latter, syntactic, mode is characterized by subject–predicate structure, tight subordination, predicate–argument structure, lots of grammatical morphology, and the like. Givón suggests that the historical trend has been an overall movement from the pragmatic mode to the syntactic mode. In his view, literate 'more complex' societies speaking languages such as English, Hebrew, Spanish, Japanese, or French exhibit the syntactic mode *par excellence*.

Givón therefore advocates a radically non-uniformitarian view of language change. If the syntactic mode comes in only with literacy, then from the origins of our species to only a few thousand years ago, all communication took place in the pragmatic mode. Indeed, even today, the grammars of the great majority of the world's 5,000 or so languages would be primarily 'pragmatic', rather than 'syntactic'. Such a view, however, seems to me to be riddled with problems. Chinese and Vietnamese, for example, exhibit many features of pragmatic mode, yet there is no sense in which one could characterize their societies of speakers as 'primitive'. Likewise, there are any number of languages spoken in pre-literate societies that seem to manifest the syntactic mode. For example, most of the Cushitic languages spoken in the Horn of Africa have subject–predicate structure, tight subordination, and so on, yet are to this day unwritten.

But one might still make the case that *some* grammatical features are more characteristic of literate than of pre-literate societies. Givón, for example (ibid. 306), suggests that use of referential indefinite subjects is such a case. I have no idea whether he is right or wrong on this point. More importantly, he

and many others have suggested that the use of subordinate clauses increases dramatically with literacy. The major study along these lines is Kalmár (1985), which maintains that Samoyed, Bushman, Seneca, and various Australian languages rarely employ subordination. According to Kalmár: 'It is quite likely that the number of subordinate clause types grew as narrative developed and accelerated with the advent of writing. Typical is the development of subordination in Greek, which hardly existed in Homer but was well developed in the classics (Goodwin 1912).' Mithun (1984) has made the same point in a Berkeley Linguistics Society paper. She undertook text counts on a number of languages with respect to the amount of subordination that one finds in discourses carried out in those languages. All languages manifest *some* subordination (in fact Tlingit manifests a lot of it) but there is a strong correlation between its rare use and the pre-literate status of their speakers.

It is important to stress that nobody—at least one would hope nobody—has claimed that there exists a language for which subordination is literally *impossible*. That really would be a 'primitive language'. All languages seem to allow the possibility. In fact, as societies 'modernize', the use of subordination becomes more frequent. For example, Kalmár observes that Inukitut is now developing subordinate clauses. Nevertheless, it appears that the correlation of the frequency of this key grammatical feature with a purely cultural development challenges uniformitarianism in its strongest form.

17.5 The Consequences of Non-uniformitarianism for Language Evolution Research

The basic problem for language evolution research, as far as the principle of uniformitarianism is concerned, is that if grammar is tailored to the needs and properties of language users (to whatever degree), and language users now are not what they used to be, then it follows that grammar is probably not what it used to be. How might language users have changed over time? In the first place, there are vastly more of them than there were in the earliest stages of human history. For example, if it is safe to assume that in early *sapiens* times, small, relatively isolated bands were the norm, then, as we have seen, the typological distribution of grammatical elements was probably different.

Along the same lines, we have to consider the question of the degree of language contact in early human societies and its typological consequences.

And this question demands in turn an answer to the epistemologically prior question of whether the human species (and hence its languages) has mono-genetic or polygenetic origins. If the latter, then early humans probably lived in small, far-flung groups, resulting in a lot less language contact. What effect would this lack of contact have had on the typological distribution of grammatical elements? Perhaps, following Trudgill and Nettle, complex and (from today's point of view) typologically rare grammatical features were the norm. On the other hand, following Dixon, if in early *sapiens* days the norm was independently functioning small groups that encountered each other from time to time, there would have been stasis and an evening out of typological properties. If the former, monogenetic, possibility is correct, then the relative patterns of typology might carry traces of this one ancestor language, potentially jeopardizing the validity of our modern perspective on what is typologically 'rare'.

Not only would early human groups have been smaller than societies today, but more importantly, their *needs* might have been different from those of modern times. And, if needs are reflected to any significant degree by language structure, then that structure would have been different as well. So we should now turn to the external (functional) factors that might plausibly be said to affect syntactic structure and see if the balance among them might have changed over time. Functional linguists and functionally minded gen-erative grammarians have generally pointed to the following three factors as the most important determinants of grammatical form: parsing pressure, pressure to keep form and meaning in alignment ('structure–concept iconic-ity'), and discourse pressure. Let us examine them briefly in turn.

Parsing pressure, or pressure to identify the constituents of a sentence as rapidly as possible, has clearly left its mark on grammatical structure. We see it, for example, in the fact that in VO languages, long (or 'heavy') grammati-cal elements tend to follow short (or 'light' ones). For example, the ordering of the constituents [verb–object noun phrase–prepositional phrases–sen-tential complement], in which there is a gradual increase in length, is very common, while other orderings of the same four elements is much rarer. And Hawkins (1994) has demonstrated that parsing pressure explains why VO languages tend to be prepositional and OV language postpositional.

Structure–concept iconicity embodies the idea that the form, length, com-plexity, or interrelationship of elements in a linguistic representation reflect the form, length, complexity, or interrelationship of elements in the concept that that representation encodes. The effect of pressure for iconicity can

be illustrated by the fact that, typically, syntactic constituents line up with semantic units. Consider also the cross-linguistic distribution of causatives and possessives.Lexical causatives (e.g. *kill*) tend to convey a more direct causation than periphrastic causatives (e.g. *cause to die*). So, where cause and result are formally separated, conceptual distance is greater than when they are not. There are two types of possessives in the world's languages: alienable possession (as in *John's book*) and inalienable possession (as in *John's heart*). Structure–concept iconicity is illustrated by the fact that in no language is the 'distance' between the possessor and the possessed greater for inalien-able possession than for alienable possession. That is, many languages have rather complex circumlocutory ways of saying *John's book* and simple direct ways of saying *John's heart*, while the reverse is never true.

Finally, pressure from discourse has been argued to play a role in shaping grammatical structure. Grammars seem to be organized so as efficiently to convey information in an orderly manner about the topicality of the contri-bution of the participants in the discourse. Consider, for example, elements that serve as discourse focus, i.e. those that play the role of new or especially important information. Such elements tend to occur in a special position in the sentence (often the very beginning or the very end) or to be marked off by heavy stress.

Now, what is the 'balance' between these forces? My view is that parsing and iconicity predominate, but with the former presenting a somewhat stronger influence on grammars than the latter. And Hawkins has shown that pressure from discourse plays a relatively minor role in shaping syntax. Many computer simulations of language evolution have explicitly or implic-itly made the same assumptions. But such assumptions are based on an examination of language spoken today. What reason do we have for think-ing that the balance of functional forces was the same 10,000 or 50,000 years ago? The simple and honest answer to that question is that we have no way of knowing. Indeed, the balance might have been very different. For example, one popular scenario for language evolution holds that the roots of syntactic structure are in conceptual representation, which at some point in human evolution was neurally linked with that part of the brain controlling the vocal tract, thereby enabling verbal communication (see Pinker and Bloom 1990; Newmeyer 1991; Wilkins and Wakefield 1995). If so, then the effects of iconicity might well have been more evident in early human language than today. Parsing pressure would have begun to shape language only gradually over time.

Parsing pressure would certainly have been weaker if—as seems plausible—subordination was a rarely used grammatical device in the earliest period of human language. One of the more common scenarios for language evolution combines, in a sense, Chomsky-style innateness with functional utility. Kirby and Hurford (1997), for example, suggest that the constraints of universal grammar (UG), while innately determined, did not arise via a genetic mutation (as suggested in Newmeyer 1991). Rather, they owe their origins to genetic assimilation (the Baldwin effect). That is, they were nativized because it was in the interests of language learners to learn their languages fast (and therefore to learn them young). The nativization of subjacency, binding, and so on would help them to do just that. Subjacency, however, manifests itself only in sentences with complex embedding. If our illiterate ancestors had little or no subordination, they would have had little or no need for this UG constraint. So if subjacency is a product of genetic assimilation, then it must have appeared rather late in the course of language evolution. Such is a non-uniformitarian conclusion, to be sure.

Another scenario—and one that we have already pointed to—holds that proto- or early language was subject to what Givón calls the 'pragmatic mode', that is, one in which discourse pressure was the primary determinant of the ordering of grammatical elements. If so, then effects of parsing and iconicity would have been less manifest than those deriving from pressure to convey information in some orderly and unambiguous fashion.

Finally, we have to think about the *time-frame* for human evolution. It is not at all obvious that the origins of the human species and the origins of 'complete' human language are contemporaneous. Published speculation on this topic shows a wild divergence of opinion. Aiello (1996) and Dunbar (1996), citing evidence for social interaction as the crucial factor, tie language to the appearance of the most archaic varieties of *Homo sapiens*—perhaps 250,000 years ago. On the other hand, Noble and Davidson (1996) link the origins of language to archaeological evidence for artefacts with symbolic significance—tens of thousands of years later. But of course, in non-uniformitarian fashion, they could all be right. Just as humans evolved over the past quarter of a million years, their language might have done so as well.

At this point, it would be desirable to write, in traditional scholarly fashion: 'In conclusion . . .' But, of course, no firm conclusion is possible, given the speculative nature of the enterprise. My feeling is that it will not be linguists who provide the next important contributions to our understanding of the degree to which language evolution and change have held true to a uniformitarian scenario. Rather, advances in our understanding will result from studies of human evolution as a whole, both biological and cultural. The more that *these* areas provide evidence for evolutionary continuity within our species, the more the evidence for a uniformitarian development of language. The more breaks in our evolutionary history there are, the more a non-uniformitarian view of language gains in plausibility. In any event, it must always be kept in mind that even if uniformitarianist assumptions are correct for linguistic studies carried out on languages existing today, it is by no means obvious that they are correct for studies of language change over evolutionary time.

FURTHER READING

Uniformitarianism in linguistics:

CARROLL, J. B. (1956) (ed.), *Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf* (Cambridge, Mass.: MIT Press).

COMRIE, B. (1992), 'Before Complexity', in J. A. Hawkins and M. Gell-Mann (eds.), *The Evolution of Human Languages* (New York: Addison-Wesley), 193–211.

NEWMEYER, F. J. (1986), *The Politics of Linguistics* (Chicago: University of Chicago Press).

SAPIR, E. (1921), *Language* (New York: Harcourt, Brace & World).

REFERENCES

AIELLO, L. C. (1996), 'Terrestriality, Bipedalism, and the Origin of Language', in W. G. Runciman, J. Maynard-Smith, and R. I. M. Dunbar (eds.), *Evolution of Social Behaviour Patterns in Primates and Man*, Proceedings of the British Academy, 88 (Oxford: Oxford University Press), 269–89.

ASKE, J. (1998), *Basque Word Order and Disorder: Principles, Variation, and Prospects* (Amsterdam: John Benjamins).

BACH, E. (1968), 'Nouns and Noun Phrases', in E. Bach and R. Harms (eds.), *Universals in Linguistic Theory* (New York: Holt, Rinehart, & Winston), 91–124.

BAUER, B. L. M. (1995), *The Emergence and Development of SVO Patterning in Latin and French* (Oxford: Oxford University Press).

BEAKEN, M. (1996), *The Making of Language* (Edinburgh: Edinburgh University Press).

BERWICK, R. C. (1998), 'Language Evolution and the Minimalist Program: The Origins of Syntax', in Hurford *et al.* (1998: 320–40).

BICHAKJIAN, B. H. (1991), 'Evolutionary Patterns in Linguistics', in W. v. Raffler-Engel and J. Wind (eds.), *Studies in Language Origins* (Amsterdam: John Benjamins), ii, 187–224.

BICKERTON, D. (1990), *Language and Species* (Chicago: University of Chicago Press).

——(1995), *Language and Human Behavior* (Seattle: University of Washington Press).

——(1998), 'Catastrophic Evolution: The Case for a Single Step from Protolanguage to Full Human Language', in Hurford *et al.* (1998: 341–58).

CARROLL, J. B. (1956) (ed.), *Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf* (Cambridge, Mass.: MIT Press).

CARSTAIRS-MCCARTHY, A. (1999), *The Origins of Complex Language: An Inquiry into the Evolutionary Beginnings of Sentences, Syllables, and Truth* (Oxford: Oxford University Press).

CHOMSKY, N. (1991), 'Some Notes on Economy of Derivation and Representation', in R. Freidin (ed.), *Principles and Parameters in Comparative Grammar* (Cambridge, Mass.: MIT Press), 417–54.

COMRIE, B. (1992), 'Before Complexity', in J. A. Hawkins and M. Gell-Mann (eds.), *The Evolution of Human Languages* (New York: Addison-Wesley), 193–211.

DIXON, R. M. W. (1997), *The Rise and Fall of Languages* (Cambridge: Cambridge University Press).

DUNBAR, R. (1996), *Grooming, Gossip, and the Evolution of Language* (Cambridge, Mass.: Harvard University Press).

GIVÓN, T. (1979), *On Understanding Grammar* (New York: Academic Press).

HAWKINS, J.A. (1994), *A Performance Theory of Order and Constituency*, Cambridge Studies in Linguistics, 73 (Cambridge: Cambridge University Press).

HEINE, B., CLAUDI, U., and HÜNNEMEYER, F. (1991), *Grammaticalization: A Conceptual Framework* (Chicago: University of Chicago Press).

HOIJER, H. (1964), 'Cultural Implications of Some Navaho Linguistic Categories', in Hymes (1964: 142–53).

HOMBERT, J.-M., and MARSICO, E. (1996), Unpublished paper, Université de Lyon.

HOPPER, P. J., and TRAUGOTT, E. C. (1993), *Grammaticalization* (Cambridge: Cambridge University Press).

HURFORD, J. R., STUDDERT-KENNEDY, M., and KNIGHT, C. (1998) (eds.), *Approaches to the Evolution of Language: Social and Cognitive Bases* (Cambridge: Cambridge University Press).

HYMES, D. (1964) (ed.), *Language in Culture and Society: A Reader in Linguistics and Anthropology* (New York: Harper & Row).

KALMÁR, I. (1985), 'Are There Really No Primitive Languages?' in D. R. Olson, N. Torrance, and A. Hildyard (eds.), *Literacy, Language, and Learning: The Nature and Consequences of Reading and Writing* (Cambridge: Cambridge University Press).

KIRBY, S. (1998), *Function, Selection and Innateness: The Emergence of Language Universals* (Oxford: Oxford University Press).

——and HURFORD, J. (1997), 'Learning, Culture, and Evolution in the Origin of Linguistic Constraints', in P. Husbands and H. Inman (eds.), *Proceedings of the*

Fourth European Conference on Artificial Life (Cambridge, Mass.: MIT Press), 493–502.

LI, C. N. (1977) (ed.), *Mechanisms of Syntactic Change* (Austin: University of Texas Press).

MATHIOT, M. (1964), 'Noun Classes and Folk Taxonomy in Papago', in Hymes (1964: 154–63).

MITHUN, M. (1984), 'How to Avoid Subordination', *Berkeley Linguistics Society*, 10: 493–523.

NETTLE, D. (1999), 'Is the Rate of Linguistic Change Constant?' *Lingua*, 108: 119–36.

NEWMEYER, F. J. (1986), *The Politics of Linguistics* (Chicago: University of Chicago Press).

NEWMEYER, F. J. (1991), 'Functional Explanation in Linguistics and the Origins of Language', *Language and Communication*, 11: 3–28.

——(2000), 'On Reconstructing "Proto-World" Word Order', in C. Knight, J. Hurford, and M. Studdert-Kennedy (eds.), *The Emergence of Language* (Cambridge: Cambridge University Press), 372–88.

NICHOLS, J. (1990), 'Linguistic Diversity and the First Settlement of the New World', *Language*, 66: 475–521.

——(1992), *Linguistic Diversity in Space and Time* (Chicago: University of Chicago Press).

NOBLE, W., and DAVIDSON, I. (1996), *Human Evolution, Language, and Mind: A Psychological and Archaeological Inquiry* (Cambridge: Cambridge University Press).

O'NEIL, W. (1978), 'The Evolution of the Germanic Inflectional Systems: A Study in the Causes of Language Change', *Orbis*, 27: 248–86.

PERKINS, R. D. (1992), *Deixis, Grammar, and Culture*, Typological Studies in Language, 24 (Amsterdam: John Benjamins).

PINKER, S., and BLOOM, P. (1990), 'Natural Language and Natural Selection', *Behavioral and Brain Sciences*, 13: 707–84.

SAPIR, E. (1921), *Language* (New York: Harcourt, Brace, & World).

——(1931), 'Conceptual Categories in Primitive Languages (Abstract)', *Science*, 74: 578.

TRUDGILL, P. (1992), 'Dialect Typology and Social Structure', in E. H. Jahr (ed.), *Language Contact* (New York: Mouton de Gruyter), 195–211.

VENNEMANN, T. (1973), 'Explanation in Syntax', in J. Kimball (ed.), *Syntax and Semantics* (New York: Seminar Press), ii. 1–50.

WEBB, K. E. (1977), 'An Evolutionary Aspect of Social Structure and a Verb "Have"', *American Anthropologist*, 79: 42–9.

WILKINS, W. K., and WAKEFIELD, J. (1995), 'Brain Evolution and Neurolinguistic Preconditions', *Behavioral and Brain Sciences*, 18: 161–226.