Introduction

Special challenges of historical linguistics

"Historical linguistics" is the study of language change and its consequences. Simply because it is the study of change, it involves a number of difficulties with which other linguists do not have to cope, at least not to the same degree. We outline the chief difficulties here not merely to warn the incautious student about what (s)he is getting into, but also and especially to say how historical linguists deal with them and how their strategies for doing so define and shape the field.

Most obviously, we can describe a change from state A to state B only after we have described the beginning and ending states adequately; thus any historical linguist has to have at least a fair acquaintance with language structure and how to analyze it. In this book we have presupposed an elementary knowledge of phonetics, of the principle of phonemic contrast, and of generative phonology and syntax because we cannot even discuss sound change, phonological change, and syntactic change without using the basic concepts of synchronic linguistics. We assume throughout that some version of the generative paradigm is the standard model of linguistic description because that reflects our professional experience.

A further set of interlinked difficulties is imposed on us by the trajectories of language changes. Most significant changes take several generations to complete; thus any study of language change necessarily involves study of the past. Of course changes still in progress can actually be observed (as the work of William Labov and other sociolinguists has demonstrated), but most of the linguistic changes that we know anything about occurred entirely in the past, and past changes have to be inferred from their consequences as recorded in documents. We are often not able to infer much about the origins and progress of a specific change. In addition, reliance on written records limits the data at our disposal in at least the following further ways.

First of all, until the invention of electronic recording equipment, all records of language had to be written records. Even if an orthography records all the phonemic contrasts and much phonetic detail (as the Sanskrit system does, for example), it cannot record every aspect of speech that is of potential interest to the linguist, and of course nearly all orthographic systems are less adequate, often

much less adequate. Thus the first challenge faced by a historical linguist using written records is to try to work out the linguistic structures partially expressed and partially concealed by the orthography, and exactly what must be done will differ markedly from one orthographic system to another. Strictly speaking that task is "salvage linguistics," not historical linguistics proper. It seems fair to say that this limitation has been overcome to a great extent by the work of earlier generations of linguists, and in this book we usually rely on their solid conclusions without further comment. Interested students can find further information in the Appendix.

A second, and much more serious, limitation is imposed by the amount of text that survives in any given language of the past. For instance, the York-Toronto-Helsinki Parsed Corpus of Old English Prose[†] contains one and a half million words of text – nearly all extant Old English prose documents – and one might suppose that that is enough to exemplify all the syntactic constructions of the language abundantly. But at least one construction is rare enough that it occurs fewer than two dozen times in the entire corpus (Speyer 2008), and there could be other, rarer ones that have not yet been noticed; if there are, it might not be possible to distinguish them from errors. The surviving corpus of Gothic is so much smaller – about 67,000 words – that we are not even able to construct complete paradigms of some of the attested lexemes, in spite of the great regularity of the language's inflectional morphology and the aid offered by several closely related languages that are better attested.

A third limitation has to do with the kinds of documents that were written and have survived to the present. Though graffiti occasionally survive even from the ancient Mediterranean world, as does at least one archive of private letters (not edited for publication, as Cicero's were), most surviving documents are in some sense "official." Most fall within a narrow, relatively elevated range of styles; much of the variation that must have been present in speech is suppressed (though more at some times and places than at others). The range of subjects is also usually restricted; for instance, most texts in the Tocharian languages deal with Buddhist philosophy and religion.

For a linguist used to working on languages still spoken, a final limitation of written documents is perhaps the most frustrating of all: there is *no negative evidence*. We have no native speakers of Classical Latin or Gothic to ask whether sentences exemplifying some particular construction are grammatical. If we find numerous examples in the relevant corpus, that amounts to being told that the construction is grammatical, but there is no real equivalent of being told that it isn't. If we find no examples of a suspect construction in the multimillion-word surviving corpus of Classical Latin, we can be reasonably sure that Caesar would have rejected it, but in the case of a language as poorly attested as Gothic many questions may remain permanently unanswerable.

[†] www-users.york.ac.uk/~lang22/YcoeHome1.htm

Meeting the challenges: the uniformitarian principle

The data of the past are so much poorer than those of the present that we can use them scientifically only by appeal to the *uniformitarian principle* (UP), as in other historical sciences. The UP holds that the processes that we see operating around us in the present must be assumed to have operated in the same ways at any given time in the past, unless we can demonstrate a discontinuity in their causes between that past time and the present (see Osthoff and Brugmann 1878, Labov 1972: 101). As it applies to linguistics, the UP can be stated as follows:

> Unless we can demonstrate a relevant alteration in the conditions of language use or language acquisition between some time in the past and the present, we must assume that the same types, range, and distribution of language structures existed and the same types of linguistic change processes operated at that past time as in the present.

Since people have undoubtedly been learning human language in the first few years of life and talking mostly to their family, friends, and acquaintances for tens of thousands of years, we can safely assume that the UP holds for as far back as we can extrapolate into prehistory (see below). Note that mass literacy and the mass media have not changed any of these fundamental conditions; that is the most basic reason why dialect diversification continues unabated, just as it always has. Widespread mobility of populations does increase language and dialect contact, but that is not a particularly modern phenomenon, as military gravestones from all over the Roman Empire testify.

Thus we can assume that all languages of the past exhibited phonemic contrasts between sounds, regardless of what their writing systems were like; that no syntactic construction of a past language violated the known constraints on natural language syntax; and so on. We can also assume that Classical Latin, for example, exhibited extensive dialect variation – geographical in the countryside, social in the city of Rome – of the sort we see everywhere around us today, even though we can see very little of it in the surviving corpus of Latin; and we can assume further that Latin sound changes worked their way through the speech community in the way familiar from Labov's research on sound change in progress.

However, there is something important we can learn from the records of the past that we cannot learn from observation of the present: we can see how language changes work out in the long term – over generations, centuries, and millennia. By far the most useful thing we learn concerns spontaneous changes in pronunciation, or "sound changes." It turns out that in any given line of linguistic "descent," defined as the process by which each new generation learns a dialect natively from older speakers with no significant breaks in transmission or interference from other dialects, *sound change is overwhelmingly regular*. This is a statistical observation, not a hypothesis; any working historical phonologist

can demonstrate it. The reasons for this startling fact, and its consequences, will be discussed more fully in Chapters 3, 5, and 10.

We can logically extend the UP to apply as follows: just as we must use what we know about the present to interpret the poorer data of the past, so we must use what we know about the present and the documented past to extrapolate into prehistory, for which we have no linguistic data at all. If sound change is regular in the historical record, it must have been regular in prehistory too. But because sound change is regular it can be modeled mathematically, and in some circumstances we can use the mathematics of sound change to reconstruct the situation before particular changes occurred, in effect "undoing" the changes. That allows us to extrapolate into prehistory by the methods discussed in detail in Chapter 10. Conversely, the replacement of inherited words undermines this type of reconstruction by steadily subtracting items that show the consequences of regular sound change, thus imposing a practical limit on how far into prehistory we can extrapolate.

That is the most spectacular consequence of the UP, but plenty of other interesting consequences will be found in this book. The UP defines and delimits scientific historical linguistics, simply because the poverty of the historical record leaves us no choice, but it also allows us to recover a surprisingly large amount of information about the linguistic past.

Selection of illustrative examples

Though it is true that the same types of "natural" linguistic change occur again and again in widely separated languages, the range of attested changes is very wide, and no single language provides examples of more than a fraction of them. We have therefore illustrated our discussion with data from a fairly large and diverse range of languages.

However, understanding the more complex structural changes requires in-depth knowledge of the languages being analyzed, and we have therefore used most often data from those languages we know best. Since both the authors were trained as Indo-Europeanists, those happen to be the earlier stages of Germanic and Celtic languages, Classical Latin, Ancient Greek, and the Tocharian languages. Since most students and instructors are not likely to be familiar with all, or perhaps any, of those languages, we have tried to explain the data well enough to make our examples intelligible to the uninitiated.

Transcription

Issues of transcription are more salient and more problematic in historical linguistics than in any other subfield. Most of the available data on

languages of the past were collected and codified by linguists who did not use the International Phonetic Alphabet (IPA); some specialist communities, such as Algonkianists and Indo-Europeanists, continue to use alternative systems of transcription which have been established for many decades. In addition, almost every human language that has been described has a "practical orthography" which is not identical with the IPA (nor, in many cases, with anything else). In order to be able to make use of those data, a linguist must be able to handle multiple systems of transcription; there is no feasible alternative. If the reader is not yet able to do that, the time to begin is now.

For the reasons just outlined we have adopted the following policy. Isolated forms which are adduced to illustrate phonological points in a discussion will usually be written in the IPA. If the issue is not phonological, or if the point at issue is clear from conventional spellings, the language's practical orthography will be used. Forms from languages that recur fairly often in the text will also be written in the transcription which is standard for that language; the phonetic values of the symbols will be explained in the notes. We outline here several systems of transcription that a student should be familiar with simply because they are widespread.

Algonkianists, like most other specialists in Native American languages, use orthographies that record surface contrasts. *č* is [ʧ] and *š* is [ʃ]; long vowels are represented either with a following colon (or raised dot) or by doubling the vowel; the latter is possible only in languages in which sequences of identical vowels do not contrast with long vowels. The palatal semivowel is written *y*.

Indo-Europeanists have a distinctive system of representation for Proto-Indo-European (PIE) forms, the phonetics of which cannot always be inferred with certainty. Three sets of dorsal consonants are reconstructed. The set furthest forward in the mouth, traditionally called "palatals" (though they were probably further back than that), are written as *$\hat{k}$, *$\hat{g}$, *$\hat{g}^h$ (or *$\acute{k}$, *$\acute{g}$, *$\acute{g}^h$); a "velar" set, further back, are written *k, *g, *g^h, and there is also a "labiovelar" set *k^w, *g^w, *g^{wh} (with lip-rounding, but otherwise identical with the velars). Three obstruent consonants, probably fricatives, are written *h_1, *h_2, *h_3; they are collectively called "laryngeals" (though the second and third, at least, were probably velar or postvelar), and there is no consensus about how they were pronounced. Syllabic sonorants are written with a circle beneath (*$\underset{\circ}{m}$, *$\underset{\circ}{n}$, *$\underset{\circ}{l}$, *$\underset{\circ}{r}$); the palatal semivowel is written *y, and vowel length is indicated by a macron (¯). Pitch accent is marked with an acute (´). For further details see e.g. Ringe 2006: 6–22.

The pronunciation of Classical Latin is recoverable in great detail; see Sturtevant 1940 and Allen 1978 for extensive discussion. The conventional spelling of Latin represents the phonemic contrasts of the language well. Note that long vowels are marked with a macron, *c* is always /k/, *v* is /w/, *qu* is /kw/ (or /k^w/; the evidence is equivocal), and *g* is always /g/ (phonetically [ŋ] before a nasal consonant).

Standardized spelling of the medieval languages of western Europe tends to follow that of Latin (marking long vowels with a macron, for example). In Old English (OE) *y* has its IPA value, *þ* and *ð* spell dental fricatives, and /k/ is normally spelled *c*. In linguistic discussions of OE *ċ* indicates a voiceless palatal stop (which had become [ʧ] by about 900 CE), and *ġ* indicates a voiced palatal fricative. In linguistic discussions of Middle English (ME) the lower mid long vowels, which have no symbols of their own in the manuscripts, are often spelled *ę̄* and *ǭ* in order to reproduce the manuscript spellings as closely as possible. The spelling of Old Norse is similar to that of Old English, except that long vowels are marked with an acute accent; *ǫ* is [ɔ].

Oscan, the ancient Italic language of the Samnites, was written in three alphabets. In representing Oscan forms the Greek alphabet is not transliterated; the Latin alphabet is transliterated in italics; the native alphabet is transliterated in boldface. The difference in the typeface of transcriptions is necessary because the spelling conventions of the different alphabets were different (!). For instance, intevocalic /s/, which was phonetically voiced in Oscan, is spelled **s** in the native alphabet but *z* in the Latin alphabet; the native alphabet did have a character **z**, but it was used to write the sequence [ts].

Except in Chapter 9, we have cited Ancient Greek forms both in the standard Greek alphabet and in a standardized transcription (based on the Attic dialect of the fifth century BCE; see Allen 1987). We hope that this will make it easier for interested students to learn traditional Greek orthography – a useful skill for pursuing further reading, since specialists do not usually transliterate Greek.

Finally, shaftless arrows (>) indicate regular sound changes; arrows with shafts (→) indicate historical changes of other kinds, as well as derivational processes. Morpheme-by-morpheme glosses employ the Leipzig Glossing Rules.[†]

[†] www.eva.mpg.de/lingua/resources/glossing-rules.php

1 The nature of human language and language variation

This chapter is, in effect, background reading; it presents our views about the nature of human language in the hope of making our perspective on language change more easily intelligible. We have not presented a survey of views on any of the subjects covered here because it is not our purpose to "teach the controversy" about the origin of signed languages, for example, or the extent to which apes can be taught to use human language. In each case we have presented the view that we believe is correct (or is most likely to prove correct in the long run). It will be seen that our perspective falls squarely within the generative tradition.

Students with considerable background in the cognitive basis of human language, as well as students whose primary concern is historical linguistics narrowly defined, may prefer to skip this chapter or postpone reading it until later.

Language is species-specific

"Language," as linguists understand the term, is a property of the human species, both unique to humans and universal among them. That seems obvious, but because it has important consequences it merits at least a brief discussion.

All normal individuals of *Homo sapiens* (the only extant species of humans) learn and use at least one language with a full set of linguistic structures and an adequate lexicon. In fact, most humans with sensory or cognitive impairment also learn and use human language. Though deaf humans find it difficult to learn spoken languages because they lack access to acoustic information, deaf communities have evolved dozens of "signed" languages – that is, languages communicated by gestures of the hands and face rather than gestures of the vocal tract – and every one that has been studied exhibits the same types of structures as spoken human languages (see e.g. Bellugi 1988 with references). That shows that human language is not dependent on vocalization, and that its organization resides in the brain; it is exactly what we should expect, given that most deaf humans are cognitively normal. But even humans with moderate cognitive impairment usually learn and use human language, and for the most part their language is normal. Apparently it is next to impossible to keep human beings from talking.

By contrast, the communication systems learned and used by all other species, though often complex, obviously differ in major ways from "language" as used by human beings. Of course no one denies that members of some other species can learn to manipulate meaningful symbols designed by human beings; experiments with chimpanzees and bonobos ("pygmy chimps"), in particular, have shown that they have some capacity for symbol use. But that is not what linguists mean by learning and using language. The differences between how the language use of young children develops and how the symbol use of young chimpanzees develops are demonstrated most forcefully by the work of Laura Petitto, who has studied both extensively and in detail. Most obviously, the signed "language" of chimpanzees, like all natural animal communication systems that have been studied, lacks syntactic structures that are universal among human languages (Seidenberg and Petitto 1979, Terrace *et al.* 1980). Since an autonomous syntax capable of generating an unbounded repertoire of recursive structures is the core of any language, this amounts to a fundamental difference between human language and all non-human communication systems (Pinker 1994: 334). It might be argued that the difference is basically quantitative rather than qualitative: apes can't learn syntax simply because they're not intelligent enough. But even if that is true, the quantitative difference is so large that in practice it amounts to a qualitative difference, in much the same way that the organization of a cell is qualitatively different from that of a crystal because of its vastly greater complexity. These observations are obviously true; every discussion of the subject ought to begin with an admission that they are true, and for our purposes the discussion might as well end there. (See further Pinker 1994: 332–69 with references.)

The uniqueness of human language demands an explanation, and the most plausible working hypothesis is that there is some sort of species-specific biological basis for human language. That should be no surprise: species-specific systems of communication are common in the animal kingdom; well-studied examples include birdsong, bee-dancing, and the vocalizations of whales. But those systems differ dramatically in almost every way imaginable, and it is worth asking whether any of them resemble human language in interesting ways. Surprisingly, the vocalizations of some species of birds provide one of the best parallels to crucial aspects of human language.

A biological parallel: birdsong

Bird vocalizations are species-specific (Becker 1982: 214), and most sounds made by birds not belonging to the large order Passeriformes appear to be innate – that is, genetically "hard-wired" in the individual. For example, members of particular species of doves (order Columbiformes) appear to acquire their species-specific calls even if raised by doves of other species, or if deafened early in life; the same seems to be true of chickens (order Galliformes) (see

Kroodsma 1982: 2–3 with references). Even the responses to species-specific sounds are at least partly innate in some species, though it is sometimes possible to "imprint" an individual early in life to respond to the vocalizations of other species (Becker 1982: 242–3).

But in most passerine bird species that have been well studied, and especially in the suborder Oscines ("songbirds," by far the largest suborder), production depends at least partly on learning (Kroodsma 1982: 11; see the tables in Kroodsma 1982: 8–9 and Mundinger 1982: 164–76, and note the cautions of Kroodsma 1982: 7, 10). It is not clear that the simpler calls of songbirds are learned rather than innate (Kroodsma 1982: 3–5), but the extended "songs" by which many species communicate can be shown to be learned. A range of rather different learning behaviors is attested. For example, some species do not develop normal songs without learning, but can learn only the song of their own species (or learn such songs preferentially), and can learn even from tape recordings; individuals of other species learn only from the birds which raised them, and these typically acquire the species-specific songs and the appropriate responses together (Becker 1982: 243–4). It is also clear that some species routinely learn songs native to other species (see Baylis 1982 for discussion).

A very widespread pattern of behavior betrays both learned and innate characteristics. Male North American song sparrows (*Melospiza melodia*), for example, produce abnormal songs if reared in isolation, which shows that at least some components of their normal song must be learned; but the abnormal songs that isolated birds produce show at least five salient similarities to normal song (Kroodsma 1977, especially pp. 397–8). Most importantly, it is not only human researchers who perceive the similarities between normal and abnormal songs; wild song sparrows respond to the abnormal songs in the same ways that they respond to normal songs, which shows that they recognize the abnormal songs as "acceptable" songs of their own species in spite of their peculiarity. That is especially striking because the abnormalities in question are pronounced; they are identifiable at a glance in spectrographic recordings, and a large contingent of experienced "birders" recognized them as abnormal in an overwhelming majority of instances. Such a pattern is common among songbird species. Male brown-headed cowbirds (*Molothrus ater*), for example, sing abnormal songs if reared in isolation, but normal females respond to those songs (with greater frequency than to normal songs, in fact). Females reared in isolation respond both to normal male songs and to abnormal male songs (again, more often to the abnormal songs; see King and West 1977). Literally the only hypothesis that will account for this pattern of facts – repeated in species after species – is that the crucial components of the songs are innate, while other components are learned. At least the innate components of such a system serve a clear functional purpose in cowbirds, which are nest-parasites (like the European cuckoo) and so are usually raised by "parents" of other species; but the system as a whole is not so obviously adaptive, especially for the vast majority of species. Since the learned components of birdsongs are apparently not crucial to the system, one might expect that they would

vary within a single species, and often they do: the songs of many species show geographic variation that can be described as "dialect" variation (see Mundinger 1982 for an interesting discussion which, among other things, considers at length the appropriateness of the linguistic concept of dialect as applied to birdsong). In other words, there is a wide range of "correct" songs among even the normal songs of many species.

The similarities between this type of birdsong and human language are clear. Children learn the language of whatever community they begin to grow up in, and a normal child will ultimately learn it more or less perfectly if the process is not disrupted; if the child uses two or more languages regularly, all will be learned without confusion. (That is so in all cases that have been studied; early exposure to multiple languages simply does not lead to "mixed" languages.) Clearly there is no single "correct" result in the learning of human language. But it would be very surprising if the species-specific nature of human language did not impose biological constraints on how a human language can be structured. Further, those constraints might be of at least two types: general limitations on human brains, vocal organs, hearing, etc. will necessarily impose limits on language, but there might also be constraints that are highly specific to language structure.

One of the most important results of modern linguistics is the discovery of universal grammatical constraints on human language. In the following section we will argue that some of these constraints, at least, are specific to human language, not merely consequences of more general human cognitive limitations.

Universal Grammar

Exactly how do languages differ? To the general public the most obvious difference is that they use different sets of *words*, the largely arbitrary strings of partly arbitrary speech sounds (or gestures, in signed languages) that signify particular concepts, which are themselves partly arbitrary. Linguists are more likely to focus on differences in syntactic structure, which is also partly arbitrary. The repeated qualifications in these statements are not hypercautious. Hardly anything about human language is *completely* arbitrary; there are very substantial constraints on speech sounds and gestures, and non-negligible constraints on how they can be combined and on what they can mean. Some of those constraints are unarguably biological.

That much is agreed on by virtually all researchers who study human language. There is considerable disagreement, however, on whether any of the constraints on human language are also specific to the ability to learn and use language. Many linguists propose that there is such a thing as "Universal Grammar," a set of constraints specific to language that govern the structures of all possible human-language grammars. The other alternative is that all the constraints on language are automatic consequences of broader and less specific constraints on human cognition, perception, physiology, and anatomy. Both alternatives are, of