Functionalism and the Metalanguage - Theory Confusion

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0. Introduction

It is often said that many functional linguists lack a 'theory'. Within formal linguistics, it is common to talk of different 'theories', such as Government-Binding Theory or Head-Driven Phrase Structure Grammar. When formal linguists look at the work of functional linguists like Givón (1984, 1990, 1995), they do not see a 'theory' in the sense of formal theories like Government-Binding Theory, and they conclude that such work lacks a 'theory' and that it is therefore 'atheoretical'. What they find lacking in much functional work is a proposed *metalanguage* in which languages are analysed or described, a metalanguage in which representations of structure and rules are stated. In this paper, I argue that this view of much functionalist work as 'atheoretical' represents a confusion surrounding the notion of 'theory', that the term 'theory' is being used here in a sense that is in many respects at odds with the way the term is used in other sciences, that this notion of 'theory' depends itself on certain theoretical assumptions about language that derive historically from views of Chomsky that he has maintained throughout his writings from 1957 on but which are widely rejected by functional linguists, and that under theoretical views shared by many functional linguists, theories of the sort assumed by many formal linguists are neither necessary nor sufficient for constructing a linguistic theory.

In section 1, I distinguish two notions of 'theory' that are assumed by formal linguists, one in which 'theory' denotes a metalanguage, the other in which 'theory' denotes a particular hypothesis about a given grammatical phenomenon. In section 2, I discuss the theoretical relevance of metalanguages from a functionalist point of view and argue that they are not of relevance to the theoretical issues that functionalists are interested in. In section 3, I discuss what it means to be a theory from a functionalist point of view and illustrate, with three examples of functional explanation, why formal theories in the sense of metalanguages cannot explain the phenomena in question and why explanations cannot in general be built into descriptions, something that is assumed in formal theories. In section 4, I discuss how Chomsky's distinction between observational adequacy, descriptive adequacy, and explanatory adequacy is useful in elucidating the issues discussed in this paper, and that they can be expressed by arguing that explanatorily adequate descriptions are impossible from a functionalist point of view. In section 5, I discuss the relevance of metalanguages to two theoretical goals other than explaining why languages are the way they are: first, theories of what underlies linguistic behaviour and, second, theories of how languages differ and how they are the same. Finally, in section 6, I discuss the relevance of metalanguages to "formalizing" accounts of linguistic phenomena in the sense of providing explicit descriptions. The overall conclusion is that from a functionalist perspective, the goal of designing theories that consist of metalanguages is of limited theoretical value, and hence that the assumption among many formal linguists that a linguistic theory requires a metalanguage is false.

1. Two notions of 'theory' in formal theory

The notion of 'theory' widely assumed in formal linguistics is essentially equivalent to that of a metalanguage for describing languages. Providing an analysis of a particular set of data within a formal theory involves providing a description of that data within the metalanguage that constitutes that theory. In general, metalanguage is a language for describing languages and in principle could be a metalanguage for describing artificial languages. For example, in computer science there are metalanguages for describing computer programming languages. This illustrates the

fact that a metalanguage is not inherently a theory. In general, a metalanguage is simply a descriptive device.

On the other hand, it is often if not usually the case that an analysis within one formal theory can be translated into a different formal theory. The notion of translation here reflects the fact that the two theories involve two different metalanguages. An analysis of a particular set of data in, say, Relational Grammar, can often be translated into Government Binding Theory or its successor theories (hereafter GB)[1]: while the account within Relational Grammar will be formulated directly in terms of grammatical relations, the corresponding account in GB might be similar in spirit except that what is expressed directly in terms of grammatical relations in the Relational Grammar account will be expressed in terms of phrase structure configurations in the GB account, where a particular phrase structure configuration in GB corresponds to the notion of 'subject' and a different phrase structure configuration corresponds to the notion of 'direct object'. The expression 'theoretical framework' is often used to denote theories in the sense of metalanguages.

There is a second sense of theory that is used by formal linguists. Within a given theoretical framework, there are often two competing analyses of some phenomenon, both expressed in the same (or essentially the same) metalanguage. These two competing analyses may differ in ways that correspond to the notion of competing theories in other sciences, where the term 'theory' is applied to competing hypotheses about a particular phenomenon, such as competing theories of black holes in physics, or competing theories of what caused dinosaurs to die out, or competing theories of speech perception. Note that the motor theory of speech perception is not really a metalanguage for describing speech perception: it is a particular hypothesis about what is happening during speech perception. Nor is it in general possible to speak of 'translating' an account of a particular token of speech perception from the motor theory of speech perception into some other theory of speech perception. This illustrates how the use of the term 'theory' to designate metalanguages is a different sense of the term from how it is often used in other sciences. Within syntax, the question of whether nouns or determiners are the heads of what are traditionally called noun phrases is a theoretical question in the second sense. The question can be addressed within different theoretical frameworks, and within different frameworks, either analysis will in general be possible. The same applies to the question of whether pronominal affixes are arguments in head-marking languages (as opposed to simply being agreement morphemes). The pronominal argument theory is a theory in a different sense from that in which Head-Driven Phrase Structure Grammar is a theory. Examples like these illustrate the two senses of 'theory'.

Now if different theories in the first sense, that of theoretical frameworks, were only metalanguages, then one might question whether it makes sense to refer to them as theories at all. If one can always translate analyses within one theory into a second theory, then it would appear that the two theories are in some sense equivalent ("notational variants") and they would thus not really be distinct theories. There are (at least) two ways in which two theories (in the first sense) might be claimed to be distinct. First, it is sometimes the case that a theory might be sufficiently constrained that there are hypothetical languages that it cannot describe. In such a case, the theory is a theory about what is a possible language: the theory claims that the set of languages it can provide grammars for is the set of possible human languages. Two theories defining different sets of languages make distinct claims as to what is a possible human language. One claim of Generalized Phrase Structure Grammar was that it defined a

more restricted set of languages than theories with transformations and that hypothetical languages that it cannot provide grammars for are not possible human languages.

A second way in which two formal theories might be distinct theories is that although both can provide descriptions for a particular set of data, one theory (or theoretical framework) may provide an analysis that is claimed to be better for some reason: it might capture a generalization the other fails to capture, or it might provide a much simpler account, or it might provide an analysis that is claimed to be more explanatory, perhaps because it captures the naturalness of the phenomenon.

Both of these ways in which formal theories can be considered distinct as theories involve differences that are claimed from a formal perspective to be explanatory. A formal theory that successfully defines all and only the set of possible human languages is claimed to explain why that set of languages is possible. And a formal theory that provides "natural" accounts of commonly found phenomena is claimed to explain why they are common. Such a formal theory is claimed to explain why human languages are the way they are. There are two variants of this claim that have been made with respect to formal theories. One, associated with the succession of theories proposed by Chomsky, is that the theory is a characterization of the innate human linguistic endowment and that this explains why languages are the way they are: on this view, languages are the way they are simply because of the nature of the innate knowledge. A second variant, and one that appears to have been associated with Relational Grammar and Generalized Phrase Stucture Grammar, is silent on the question of innate knowledge and simply claims the theory to be explanatory by virtue of characterizing the set of possible human languages.

To summarize, the standard view in formal linguistics is that a major component in engaging in linguistic theory involves the design of a metalanguage for describing linguistic phenomena. In traditional transformational grammar, for example, the metalanguage involved phrase structure rules defining syntactic categories, different levels of structure, including deep and surface structure, and transformations for relating these different levels. Relational Grammar differed as a metalanguage in adding to the metalanguage direct reference to grammatical relations and a different way of talking about relationships among levels. Head-Driven Phrase Structure Grammar differs as a metalanguage in not having different levels of structure and in adding a more elaborate theory of syntactic features. The metalanguage of more recent versions of Chomskyan theory sharply distinguishes features in the description that are claimed to be universal and innate from features that are claimed to be language-specific. Descriptions of the same linguistic phenomenon, say the passive construction in English, will look different in each of these four metalanguages, these four theoretical frameworks (one difference being whether there is a distinct phenomenon that can be called "the passive construction"). In so far as these four descriptions differ because they are in different metalanguages, the differences are somewhat analogous to the differences among four descriptions of the Eiffel Tower, one in French, one in English, one in Japanese, and one in Navajo. However, from the perspective of proponents of these four metalanguages (these four theoretical frameworks), the four descriptions of the passive construction in English differ in a more significant way: proponents of the four metalanguages would argue that *their* metaluaguage is the *better* metalanguage and that as a result their description is the better description. In contrast, if we assume that the four individuals describing the Eiffel Tower in each of their four languages are not linguistically naive, we can assume that they would probably not want to argue that their description is better just because of the language of the description, that the speaker of French, for example, would not claim that their description of the Eiffel Tower was better just because it was in French. From the perspective of a formal linguist, the difference between these two cases is obvious. While the different theoretical frameworks may be different metalanguages, they are not *just* different metalanguages; they make different "theoretical" claims, and the proponents of the different theoretical frameworks would

claim that their theoretical framework is the right one because its claims are true in ways that the theoretical claims embedded in the other theoretical frameworks are not.

What I will argue in the remainder of this paper is that from a functionalist perspective, these two cases, the one involving descriptions of the Eiffel Tower, the other involving descriptions of the passive construction in English, are not nearly as distinct as formal linguists would think. I do not want to deny that some of the arguments that formal linguists of some persuasion may give for their own theoretical framework are necessarily without merit. Rather, my claim is that the differences among different formal theoretical frameworks are irrelevant to the theoretical questions that are central to functionalists, that these theoretical questions cannot in general be answered by the choice of metalanguage, that it doesn't matter what metalanguage is chosen for describing the passive construction in English, and hence that the goal of designing a metalanguage is simply irrelevant to the theoretical concerns of functional linguists. My purpose is not to claim that there is anything misguided about designing metalanguages, designing theories in the sense of formal linguistics, but rather to claim that linguists are confused who think that functional work is atheoretical or that it is somehow theoretically deficient because of the lack of concern about designing metalanguages. My claim is that the pursuit of the goals that are central to functional linguistics is not served by designing metalanguages.

2. The Functionalist View

So let us turn now to functionalist alternatives. I must say from the start that because of the diversity of opinions associated with the label "functionalism", what I say here should not be considered a statement of "the" functionalist position (since no such thing exists), but rather a position I myself am taking as a functionalist. For ease of exposition, however, I will refer to this as "the" functionalist position. I should also note that the term "functionalism" has been associated with two rather distinct enterprises. One of these, which I would call "descriptive functionalism", is describing how particular grammatical constructions in different languages are used, particularly in describing the pragmatic or discourse factors governing their use. The second enterprise associated with the term "functionalism" is that of "explanatory functionalism", explaining why languages are the way they are in terms of considerations "outside" of language, in terms of general cognition or in terms of the communicative functions of language. My use of the term "functionalism" in this paper is restricted to the second of these two enterprises. There are some linguists who call themselves functionalists who engage solely in the first enterprise and may actually deny they are making any claims of the second sort; Ellen Prince (1985, 1992) appears to be an example of a functionalist of this sort. My use of the term "functionalist" should thus be taken in a narrower sense than the way some people use the term.

Consider now a functionalist response to the formalist notion of theory, in the sense of metalanguage or theoretical framework. The view of theories as characterizing the innate human linguistic endowment is rejected by functionalists because it claims (or appears to claim) that general cognitive factors and communicative function play no role in explaining why languages are the way they are. And since under the normal functionalist view, there is no reason to posit innate human endowment that is specifically linguistic, the goal of constructing a theory or metalanguage that characterizes this innate endowment makes no sense.

The view of a formal theory as a characterization of innate human linguistic endowment with the associated hypothesis that this endowment explains why languages are the way they are means that the theory is at least an hypothesis for why languages are the way they are, even if the hypothesis is viewed as false. The alternative view of formal theories simply as characterizations of human language without any psychological claims fairs even worse under a functionalist view. An alleged theory that

claims to do no more than characterize what the set of human languages is and to provide descriptions for languages cannot explain why that set is the set of possible human languages rather than some other imaginable set or why languages exhibit the properties that the theory, as metalanguage, can only describe. At best it is a theory in the sense of an hypothesis of *what* languages are like, but it cannot say anything about *why* they are that way. As such, it is not a theory of why languages are the way they are.[2]

Let me summarize the discussion so far. A formal linguist may look at what a functionalist is doing and ask what is theoretical about what the functionalist is doing since they (the formalist) will see no attempt to propose a metalanguage for describing languages. Since under a formalist view, theories *are* metalanguages, the absense of a metalanguage implies the absence of a theory. But under a functionalist view, proposing a metalanguage for describing languages does not serve the theoretical goal of explaining why languages are the way they are: it either is not a theory in this sense, or it is a theory that is false.

But one might ask: if one does not have a metalanguage for describing languages, how can one describe them? And if one does not describe them, how can one describe what languages are like, let alone explain why they are that way? My response is that we do indeed need to describe languages, and describing them entails having some sort of metalanguage, but it does not particularly matter what the metalanguage is. There may be practical considerations, such as choosing a mode of description that is user-friendly, but on the whole the choice of metalanguage is devoid of theoretical implications. And there is no need for different linguists to use the same metalanguage, any more than there is a need for all descriptive grammars to be written in English rather than, say, French. Most descriptive grammars succeed in describing languages far more explicitly than descriptions produced by formal linguists working in the Chomskyan tradition, since most work produced by formal linguists describes at most a small fragment of languages.[3] The crucial point is that from a functionalist perspective, the choice of metalanguage is largely devoid of theoretical consequences, and thus the formal concern with the choice of metalanguage usually involves concern with questions of no theoretical significance.

3. Functional Theory

The discussion so far has focused in a rather abstract way on why concern with what formal linguists often call "theory", i.e. a metalanguage for describing languages, is theoretically irrelevant from a functionalist perspective. In this section, I will consider three examples of functionalist theory, in the sense, not of a metalanguage, but of a

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[2] This is not to say that it is not a theory: it is a theory of what is a possible human language; it is simply not a theory of *why* languages are the way they are, or why what is a possible human language is possible and why what is not possible is not possible. Similarly, it would not be wrong to describe such approaches as explanatory. They would be explaining why particular languages exist and why particular languages have properties they do which conform to what is possible. But they would not be explaining why what is possible is possible. Newmeyer (1998, Chapter 3) refers to the former kind of explanation as "internal explanation" and the latter as "external explanation". I believe that his use of these expressions is nonstandard; under his use, appeals to innate linguistic knowledge are a type of external explanation, but under the usage I am familiar with such appeals are internal in the sense that they appeal only to linguistic notions.

[3] Much of what I say in this paper takes GB as the prototype in my characterization of formal theory. Some of these comments do not hold well of Head-Driven Phrase Structure Grammar (Pollard and Sag 1994). For one thing, HPSG does not attempt to be a theory of why languages are the way they are in the way that GB does. For another, HPSG aims for more precise description than GB, or other formal theoretical frameworks, or most descriptive work.

theory of why languages are the way they are in some particular respect. The first two examples, in fact, will to some extent be two different theories of the same phenomenon. In all three cases, I will focus on the question of why choice of metalanguage is largely irrelevant, of why, if the explanations are correct, they are not things that could be built into the metalanguage and thus, if explanations of this sort are correct, trying to construct linguistic theories by means of constructing metalanguages is misguided. The first example will be from my own work (Dryer 1992), the theory that the word order correlations made famous by Greenberg (1966) reflect a tendency in language to avoid a mixture of left and right-branching. The second example will focus on a particular instance of a word order correlation, that of prepositions with noun-genitive order, and discuss the theory (e.g. Givón 1984) that this reflects the nature of grammaticization. The third example will be the theory of Du Bois (1987) for the existence of ergative patterns in language. I will only give a sketch of the explanations here; readers are referred to the original sources for more detailed discussion. I should also emphasize that it is not my purpose to argue *for* these theories. Rather, my goal is to argue that *if* these theories are correct, they involve explanations that cannot be captured in the formalist mode of theorizing, that of designing metalanguages.

3.1. A Parsing Account of Word Order Correlations

It is argued in Dryer (1992) that the pairs of elements whose order correlates with the order of object and verb (and with each other) are pairs of elements consisting of a single word and a phrase, and that contrary to some views, the single word need not be a grammatical head, and that pairs of elements not involving a single word and a phrase do not correlate with the order of object and verb, even when one of the two elements is a head. The effect of these correlations is that languages tend towards one of two ideals, languages which are consistently right-branching (like English, except for prenominal genitives) and languages which are consistently left-branching (like Japanese). It is further proposed that this tendency reflects the fact that mixing left and right branching leads to structures which are more difficult to parse. For example, in English, we can express possession by means of either the left-branching prenominal genitive, as in (1), or the right-branching postnominal genitive, as in (2).

(1)   [[John]'s brother]'s car
(2)   the car of [the brother of [John]]

We can mix the two constructions, as in (3) or (4).

(3)   the car of [[John's] brother]
(4)   [the brother of [John]]'s car

The structure in (4) is superficially confusing, since one might be tempted to misparse it and interpret it as implying that John's car has a brother. This confusion is also illustrated by the classic example in (5), in which one is tempted at first to parse it such that *England's crown* is a constituent, when in fact the *'s* combines syntactically with the entire noun phrase *the Queen of England.*

(5)   [the Queen of England]'s crown

And a language like English with a postnominal genitive involving a postposition *of* would express (2) as in (6), in which a series of postpositions at the end would present a possible problem figuring out which postposition went with which element.

(6)   the car [the brother [John] of] of

The proposed explanation for why languages tend toward consistent right branching or consistent left branching is thus that mixing the two types of branching more often leads to structures which are difficult to parse.

Now consider how this explanation might be incorporated into a formal theory. One could certainly capture the consistent right-branching in a language by positing a single ordering rule of the form 'X precedes Y, where X is lexical and Y is a phrase'. But this would not explain *why* such a language might be consistently right-branching, that such reflects parsing difficulties associated with mixed branching. Or, within a theory that claims to be characterizing innate human linguistic endowment, one might posit a typological parameter of branching direction, with two values left and right. But not only would this fail to capture the (assumed) fact that this tendency towards these two ideals reflect the nature of parsing, but it would *falsely* claim that children have an innate linguistic expectation that the language they are learning will be consistently left or right branching, while under the proposed account this is not the case. It is simply claimed that if a language is not consistently left or right branching, certain structures will be more difficult to parse. The thrust of the theory is that languages with such mixed branching are more likely to develop new ways to avoid the mixed branching, with the net result over time that languages with mixed branching will be less common. This does not involve attributing to the child any innate assumptions the child will make as to how to "project" their language from the data they are exposed to, that they will hear some right-branching structures and assume that other structures are right-branching as well, or anything of the sort. The nature of the parser is necessarily partly innate, but there is no evidence that it involves anything other than general cognitive properties or that it plays any role in assisting children to make inferences from input sentences about the grammaticality of other structures. In fact, under the traditional view in generative grammar, the parser is a performance mechanism and thus independent of the competence consisting of the grammar.

What do we need to assume is expressed in a description of a language that is relevant to this tendency towards consistent branching direction? Certainly, the description would appear to require some sort of notion of constituent structure. However, this kind of assumption is one that is sufficiently basic that something like it is assumed by *all* modes of description. In other words, we do need a metalanguage that recognizes something like constituents, but this is an extremely minimal and apparently uncontroversial assumption. And it does not require that the so-called constituents be syntactic entities rather than purely semantic ones. In other words, the claim that *the Queen of England* is a constituent while *England's crown* is not in (5) can be interpreted as no more than saying which words go together semantically. Whatever role syntax may play in parsing, the ultimate goal of parsing sentences is to extract the meaning, and part of this involves recognizing which words go together semantically. Thus interpreting (5) involves recognizing that the crown belongs to the Queen of England rather than to just England. The theory that the word order correlations reflect a tendency to avoid mixed branching and that the tendency to avoid mixed branching reflects parsing difficulty claims no more than that in languages with mixed branching, hearers will occasionally have greater difficulty assigning meanings to sentences because of difficulties figuring out which words go together semantically. It is difficult to imagine a metalanguage for describing languages which did not recognize the fact that some combinations of words but not others go together semantically.

And crucially, there is no need to state as part of the grammar of a language with consistent right-branching that the language is consistently right-branching. Under the assumptions of the theory, there is no reason to believe that speakers incorporate as part of their internalized grammar any generalization of this sort. One can assume that they know each of the individual constructions and that their knowledge of each construction involves knowing the order of elements, but there is no need to claim that speakers also incorporate as part of their knowledge of the language some general rule that states that all of the constructions are right-branching. Such a generalization is unlikely to be

particularly helpful in producing or parsing the language. The *fact* that each of the constructions "happen" to be right-branching will make the language easier to parse, but that does not imply that the generalization that all of the constructions are right-branching need be part of the speaker's knowledge. There is no reason to believe that speakers ever notice that all of the constructions are right-branching. In the minority of languages where there is mixed branching, the existence of mixed branching will (by assumption) occasionally make structures more difficult to parse, but again there is no need for speakers of such languages to recognize that the difficulties in parsing arise due to a mixture of left and right branching. The general point is one emphasized by Derwing (1973) but so often forgotten by linguists: the existence of a generalization across classes of words or sentences in a language does not entail that that generalization is part of the speakers' knowledge of the language.

3.2. Grammaticization accounts of the preposition : noun+genitive correlation

The account of the word order correlations in terms of branching direction discussed in the preceding section contrasts with a very different account in terms of grammaticization. However, where there are competing functional explanations for linguistic phenomena, this does not mean that the two explanations are in conflict with each other. Functional explanations in general reflect pressures on linguistic change and such pressures will sometimes work together, and sometimes compete with each other (cf. Haiman 1983, 1985; Du Bois 1985, 1987). In the present case, the two theories are compatible and probably both play a role in explaining word order correlations.

I will restrict attention here to a grammaticization account of a single correlation, the fact that prepositions correlate with noun+genitive order and postpositions with genitive+noun order. Under the theory discussed in the preceding section, this correlation reflects the fact that preposition+object and noun+genitive order are both right branching while the opposite two are both left branching. Under a grammaticization account, this correlation arises because of the fact that a common diachronic source for adpositions is head nouns in genitive constructions and the original order tends to be retained after the grammaticization. Suppose, for example, that a head noun meaning 'back' becomes grammaticized as an adposition meaning 'behind'. If the language has noun+genitive word order, the original construction will be something of the form 'back (of) NP', and when the word meaning 'back' is reanalysed as an adposition meaning 'behind', the new form will be 'behind (of) NP', and the adposition will be a preposition, preceding its object, its position relative to its object reflecting the order in the structure from which it arose historically. On the other hand, if the language has genitive+noun order, the original construction will be something of the form 'NP('s) back', and again, if the original order is retained, the resultant construction will be of the form 'NP('s) behind', with the adposition meaning 'behind' a postposition, following its object. If we ignore other possible grammaticization sources for adpositions, and if we assume that the order of genitive constructions and adpositions more commonly remains the same over time, then we will expect to find the correlation that is found between the order of noun and genitive and adposition type.

The general phenomenon being described here is illustrated by various prepositions in English which reflect different stages of grammaticization from head nouns in noun+genitive constructions, as in (7), although in most of these cases an earlier preposition combines with the head noun to form a new historically complex preposition.

(7)   a.   inside the house
       b.   because of the weather
       c.   on top of the dresser

Because each of these constructions arose from a noun+genitive construction, the result was a preposition rather than a postposition. In languages where this process happens to genitive+noun constructions, the head noun will become grammaticized as a postposition.

Assuming for the sake of argument that this theory is the correct explanation (or one correct explanation) for the correlation of prepositions with noun+genitive order, consider its implications for a formal theory that attempts to explain why languages are the way they are in terms of its choice of metalanguage for describing languages. Here the situation is even worse than for the theory discussed in 3.1, since at least there it was claimed that the less frequent type presented some cognitive difficulty to speakers of the language. Under a grammaticization account, a language with postpositions but noun+genitive order will be just as easy to learn and just as easy to use as one with prepositions and noun+genitive order. There is nothing cognitively unnatural about such a language. And it is certainly not the case under this theory that children learning a language will expect the language to be consistent. The only reason for the lower frequency of such a language is the fact that it will only arise if it has recently changed its order of noun and genitive. The general point is that one will frequently find languages exhibiting properties that reflect the history of the language but which are not properties reflected in the rules of the language itself. Again this finds parallels in the discussion in Derwing (1973): languages frequently exhibit patterns that involve regularities that are fossil remains of previous stages of the language, but which are not reflected in the grammars internalized by speakers.

And note once again that it does not really matter what metalanguage is used to describe languages exhibiting adpositions grammaticized from head nouns in genitive constructions. The only thing relevant to the explanation is the historical source of the adpositions. But since this is not part of the synchronic grammar, it would be a mistake to somehow express this in a synchronic description of the language.

3.3. Du Bois' Theory of Ergativity

I will summarize the theory of ergativity proposed by Du Bois (1985, 1987), taking the liberty to simplify it somewhat for expository purposes, since my goal here is to illustrate the implications of a theory of its kind, rather than to discuss its specifics. Du Bois observes that in discourse across languages, lexical noun phrases (i.e. ones involving nouns rather than just pronouns) occur with different frequencies in different syntactic positions. In particular, he observes that subjects of transitive verbs are lexical NPs much less often than subjects of intransitive verbs or objects of transitive verbs. According to Du Bois' theory, ergative and absolutive categories arise in some languages as a grammaticization of this pattern in language use. I will discuss a simplified variant of his theory, which focuses on the role of case marking in distinguishing the two arguments in a transitive clause. In intransitive clauses, there is no need for case marking, since (apart from nonarguments), the role of a single argument will be clear from the verb. In transitive clauses, there are a number of possible ways of marking the arguments in such a way that they will be distinguished. One could mark both arguments with a case marker, the case markers being distinct from each other. However, this is unnecessary since a single case marker on one of the two arguments will serve to distinguish the two. If one assumes that the intransitive argument is unmarked, then this leaves two possibilities. One is to mark the subject of the transitive clause and leave the object unmarked. The other is to mark the object of the transitive clause and leave the subject unmarked. If a language chooses the first of these two options, the result will be an ergative case marking system with an overt case

for the ergative (the subject of a transitive verb) and a zero case for absolutes (the subject of an intransitive verb or object of a transitive verb).[4]

Note that this theory applies not only to clauses with two lexical arguments, but also to clauses with a single lexical argument. The case marking is necessary to disambiguate the two schematic examples in (9).

(9)   a.   woman-erg   see-3sg,3sg
                The woman saw him.

        b.   woman   see-3sg,3sg
                He saw the woman.

In a language in which both subject and object precede the verb, many clauses with a single overt argument (and the other realized solely by the verb morphology) would be potentially ambiguous if there were no case marking on one of the two arguments. As long as there is case marking on at least one of the two arguments in transitive clauses, this ambiguity will not arise, as illustrated in (9).

There are a number of considerations that lend plausibility to the idea that something like this is an explanation (or part of an explanation) for the existence of languages with ergative case systems. First, there are many languages with ergative case systems which are accusative in their syntax, so that the ergativity manifests itself only in the case marking. Second, in the majority of languages with ergative case systems, the absolutive case is a zero case; the proposed theory depends crucially on this. Third, there are a number of languages (e.g., Hanis Coos (Frachtenberg 1922), Tauya (Macdonald 1990)) in which ergative case marking is optional, one of the factors contributing to its use being that of disambiguating an otherwise ambiguous clause. And fourth, Du Bois' observation that transitive subjects are lexical much less often than objects means that in a clause containing one lexical argument and the other argument realized by the verb morphology, the typical situation for transitive clauses and hence the one that hearers will otherwise expect will be the one in which the single lexical argument will be the object.[5] Hence employing an overt case marker on a lexical transitive subject in the minority of instances in which the lexical argument is the subject will serve as a signal of the unexpected situation of the lexical argument being subject. Or, equivalently in terms of markedness, the less frequent situation is the one where the single lexical argument in a transitive clause is the subject, and hence it is natural that it will be the one that is morphologically marked.

As with the two previous examples, the nature of the explanation is not something that can be captured by choosing the right metalanguage. The explanation lies in the relative frequency of different constructions in discourse, which is independent of the form of the grammar. This explanation illustrates a general idea with a long history in functional explanation: a principle of 'least effort', or what Haiman

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[4] If a language chooses the second of these two options, the result will be an accusative case marking system, with an overt accusative case for the object in transitive clauses, and zero marking for both intransitive and transitive subjects. While this choice results in a system that is less economical (given that lexical objects are more common than lexical subjects in transitive clauses), Du Bois posits an alternative motivation for accusative marking: intransitive subjects and transitive subjects share the property that they are the typical loci of continuing reference. The existence of the two types of languages reflects competing motivations.

[5] Note that the argument assumes that languages will typically not express pronominal subjects and objects by independent pronouns. English is apparently somewhat exceptional among languages in requiring subject and object pronouns: in a sample of languages discussed by Gilligan (1987), fewer than ten percent of the languages were like English in this respect.

(1983, 1985) calls 'economy'; this principle tends to cause forms which are more frequently used tending to be shorter than forms that are less frequently used. The case marking system that is most efficient in this respect is one that overtly marks the subject in transitive clauses, but leaves objects and intransitive subjects unmarked. Since this explanation makes crucial appeal to the notion of relative frequency in discourse, it is not something that is part of grammars themselves and thus not something that is part of the speaker's knowledge of the language itself. In so far as language change is driven by functional motivations that involve relative frequency of usage, we cannot explain the diachronic sequence of grammars in terms of the grammars themselves, since what will be a natural sequence of grammars will depend on the frequency of usage of different constructions. Hence there is no way in which the choice of metalanguage in which the grammars are formulated could explain why some grammars are more natural than others.

4. Explanatory Adequacy

Chomsky (1965) made a three way distinction that is useful in understanding the point that I am making in this paper. He distinguished three levels of adequacy that an analysis of a particular set of data might achieve: observational adequacy, descriptive adequacy, and explanatory adequacy. While many functionalists probably consider the issues surrounding these three levels of adequacy to be irrelevant to their concerns, since they were originally characterized by Chomsky in terms of sets of generative rules, I will argue that a more liberal interpretation of these notions makes it possible to express more clearly certain properties of formal theories that most functionalists reject, and more importantly for present purposes, to explain why the notion of theory consisting of a metalanguage is not only unnecessary for functionalist theory but also irrelevant.

The lowest of Chomsky's three levels of adequacy was that of observational adequacy. In terms of a set of generative rules, a particular set of rules was observationally adequate if it generated all and only the forms in the set of data to be accounted for. Two sets of rules might generate different sets of forms, and if one of them generated the set of forms to be accounted for while the other did not, the first is to be preferred on the basis of observational adequacy.

On the other hand, it is possible for two analyses to both be observationally adequate but to differ in the second level of adequacy, that of descriptive adequacy. Although Chomsky's characterization of descriptive adequacy is subject to different interpretations, I will assume here that an analysis is descriptively adequate if it is observationally adequate and if it expresses all and only those generalizations that are part of a speaker's knowledge of the language. There is considerable vagueness in this characterization that I will not attempt to remove, but there are at least some cases in which it is clearer what is involved. The issue is somewhat clearer in the context of phonology, and issues of abstractness in phonological theory relate to the issue of whether generalizations expressed in an analysis correspond to generalizations that speakers make (in some sense). Thus, either an analysis that fails to capture generalizations that speakers make or an analysis which expresses generalizations that speakers do not in fact make will fail at the level of descriptive adequacy. Much traditional argumentation in generative theory, particular in phonology, will take two observationally adequate accounts and argue that one is to preferred over the other because it captures a generalization that the other fails to capture. As pointed out by Derwing (1973), the traditional mode or argumentation in generative linguistics has been to assume without argument (often only tacitly) that any generalization that can be expressed is part of a speaker's knowledge. In other words, arguments for descriptive adequacy traditionally aim to capture generalizations, and do not concern themselves with the question of whether the generalization is one that speakers make, often assuming on a priori grounds that speakers "must" make these generalizations since making these generalizations allows for a more compact representation of the language.

The third level of adequacy is the one that is most crucial to the present discussion, that of explanatory adequacy. Two analyses can be descriptively adequate, but one more explanatorily adequate if the metalanguage in which it is formulated more closely approximates the set of possible human languages. It was common in the late 1960s and early 1970s for arguments to be directed against a theory (such as generative semantics) on the grounds that that theory was too powerful, where a theory is too powerful if it defines an unnecessarily large set of possible human languages. Note that the relevant sense of theory here is that of metalanguage: if a hypothetical language cannot be given a descriptively adequate account in a particular metalanguage, then that metalanguage, as a theory, is inadequate. If a hypothetical language can be given a descriptively adequate account in only one of two metalanguages, and there is no evidence that the hypothetical language is a possible human language, then the more restricted metalanguage is to be preferred, since it more closely approximates the set of possible human languages. And any description of an actual human language in the more restricted of these two metalanguages will be more explanatorily adequate in that only the more restricted metalanguage will "explain" (so to speak) why the language does not have properties that are not describable in the more restricted metalanguage.

The notion of explanation that is assumed here, however, is based on characterizing or describing the set of possible human languages. Under Chomsky's assumption that the set of possible human languages is defined by innate linguistic knowledge, characterizing the set of possible human languages is viewed as characterizing this innate knowledge, and the explanation for why this set is the set of possible human languages (rather than some other conceivable set) is simply that this is the set defined by the innate knowledge.

The discussion so far in this section has discussed Chomsky's three levels of adequacy in terms of the point of reference assumed by Chomsky, both in terms of a grammar as a set of rules generating the grammatical sentences in a language and in terms of his assumption that what explains why languages are the way they are is their innate linguistic knowledge. How are these levels of adequacy relevant to functionalism and to the notion of a metalanguage as a theory?

I would claim that something akin to observational adequacy is assumed by functionalists, though the original characterization in terms of a set of rules generating all and only the grammatical sentences in a language is clearly inconsistent with various tenets of functionalism. Functionalists would in general reject many assumptions of the original view, such as that a language consists of a set of sentences, that one can distinguish grammatical from ungrammatical sentences, that one can ignore the meaning and function of sentences, and even that the notion of a sentence abstracted from context is a coherent notion. But functionalists would in general consider a description of a language inadequate if it implied that speakers says things that they in fact do not say, if it failed to characterize the meaning or function of sentences at all, or if it implied that people use certain sentences in certain contexts when in fact they do not use them in those contexts. It would probably be possible to come up with a characterization of observational adequacy that would be more consistent with functionalist views, but I will not pursue that here. The crucial point is that there is a generalized version of the notion that is relevant to the criteria of all linguists, including functionalists.

I think that it is also the case that many functionalists also assume the relevance of something akin to descriptive adequacy, that if two descriptions of a language differ in that one is clearly inconsistent with what is inside speakers' heads, then the other one is to be preferred. Some functionalists question whether one can find out what is happening inside speakers' heads, and may question the importance of this as a consideration, but I think that it is fair to say that even they would tend to agree that in so far as we *can* tell what is inside speakers' heads, a description of aspects of a language that is more consistent with what is inside speakers' heads is to be preferred.

It is at the notion of explanatory adequacy that, I claim, is least consistent with functionalist views, and the point is precisely the central point of this paper. I have argued above that the nature of functional explanation is such that it cannot in general be expressed in the description of languages, and thus cannot be expressed by the appropriate choice of metalanguage. I have argued above that the three examples of functional explanation I have discussed are ones that cannot, in principle, be expressed by the choice of metalanguage. What this implies is that under a functionalist view of language, the very notion of explanatory adequacy is misguided. Note that it is not explanation or the search for explanation that is misguided; rather it is the notion that one can achieve explanation by picking the "right" metalanguage. What I have argued implies that under a functionalist view, the task of explaining why languages are the way they are and the task of describing languages are not related in the way they are assumed to be related in formal linguistic theory. Rather, the task of explaining why languages are the way they are is something that goes on independently of how languages are described, as long as they are described in a descriptively adequate way. None of the three functional explanations discussed above imply anything about how languages should be described, beyond the need for their descriptions to be descriptively adequate. And in so far as the term 'theory' denotes explaining why languages are the way they are, this means that questions about how to describe languages and questions of linguistic theory are independent: questions of linguistic theory do not bear on questions of how to describe languages, or what metalanguage to use to describe them, and questions of what metalanguage to use to describe languages is not a question of theoretical consequence. In short, under a functionalist view, designing metalanguages for describing languages is not only not necessary for engaging in linguistic theory, but is actually something that diverts linguists from investigating theoretical questions.

5. Other Theoretical Goals

The argument in the preceding section, that choice of metalanguage is irrelevant to linguistic theory, actually overstates the case somewhat, since it is based on the assumption that the only theoretical goal in linguistics is to explain why languages are the way they are, to explain why certain hypothetical languages are not possible human languages or at least why certain hypothetical languages are more likely to exist as real languages than others. But there are other theoretical goals in linguistics, and the question remains whether this view obtains relative to other possible goals. In this section, I want to discuss the relevance of metalanguages to two other theoretical goals, that of explaining linguistic behaviour by describing the nature of cognitive mechanisms underlying language use, and that of theories of what language are like, how they differ, and how they tend to be the same.

5.1. Theories of linguistic behaviour

The first of these goals is that of explaining linguistic behaviour by describing the nature of cognitive structures or mechanisms underlying language use. I assume that part of this is characterizing the nature of speaker knowledge of language, that one of the cognitive structures underlying language use is the knowledge of the language that can be called the grammar of the language, though I assume that this knowledge interacts extensively with other cognitive mechanisms and that it may not even be possible to completely distinguish this knowledge from other forms of knowledge. In so far as a descriptively adequate description of a language must in some sense correspond to a speaker's knowledge of a language, then achieving a descriptively adequate description succeeds in describing the language in so far as is necessary to accomplish this theoretical goal. Thus, if two descriptions are both descriptively adequate, then the differences between them are irrelevant as far as this theoretical goal is concerned, and they are "notational variants". Under a Chomskyan view, given two

descriptively adequate accounts, one chooses the one that is more explanatorily adequate.

But I have argued in the preceding section that the Chomskyan goal of choosing the descriptively adequate description on the grounds of which is more explanatorily adequate is irrelevant under functionalist assumptions, since the notion of explanatory adequacy makes no sense under those assumptions. Nevertheless, the choice of metalanguage is not entirely irrelevant to the goal of explaining linguistic behaviour: if a metalanguage is so constrained that it cannot provide descriptively adequate descriptions, then this metalanguage is inadequate. Hence, while finding an appropriate metalanguage may be theoretically irrelevant as far as the theoretical goal of explaining why languages are the way they are is concerned, it is not completely irrelevant relative to the theoretical goal of describing cognitive mechanisms underlying linguistic behaviour. However, it is relevant only in so far as the metalanguage must be powerful enough to provide descriptively adequate descriptions. The notion of a metalanguage being "too powerful" does not arise, since this notion is relevant only to the theoretical goal of explaining why languages are the way they are, and I have argued in the preceding section that choice of metalanguage is not relevant to this theoretical goal.

Whether advances in linguistic theory over the past thirty years have contributed to the goal of providing descriptively adequate descriptions of languages is something that is probably subject to considerable argument. One can formulate this question by asking to what extent the metalanguages of formal theories make it possible to achieve descriptive adequacy in ways that structuralist theory of the 1940s or even the implicit descriptive frameworks of missionary grammars of the 19th century did not. There are probably many ways in which they have. However, from a functionalist point of view, these advances are rather limited. For one thing, many of the phenomena that have been the focus of attention for formal linguists, such as long distance dependencies and binding phenomena, are often viewed by functional linguists as highly marginal phenomena, where the relevant grammaticality judgments often seem questionable, where it is not clear that the judgments are not artifacts of judging sentences in isolation, where it remains unclear that the judgments reflect anything that is reflected in actual linguistic behaviour, and where it is often the case that the constructions in question are used so infrequently as to make them peripheral to the language. In many instances, the set of examples that formal linguists use to illustrate the formal constraints they propose seem to be an artificial subset of the set of possibly relevant examples, and more often than not, when linguists dig deeper, it is easy to find examples which the syntactic constraints do not adequate describe and which suggest that whatever is going on is actually something considerably more complex - and often interacting considerably with semantic and pragmatic factors - than the formal account suggests. In other words, it often looks like the formal mechanisms that the metalanguages of formal theories provide are woefully inadequate for really describing the phenomena in question, and for that reason it is dubious whether the metalanguages of formal theories really do offer much towards the goal of achieving descriptive adequacy (or even observational adequacy) and hence of characterizing the knowledge that underlies linguistic behaviour.[6]

5.2. Typological theory

Another theoretical goal of linguistics is that of describing the variation among human languages and the limits to this variation, what one might call typological theory. This goal is often characterized by formal linguists in terms of characterizing what is a

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[6] This is probably misleading: the precision of Head-Driven Phrase Structure Grammar probably provides ways to describe some linguistic phenomena in ways that might otherwise be confusing. On the other hand, the analyses of HPSG are sufficiently user-unfriendly that it is doubtful that it provides a practical means of describing languages.

possible human language, but I argue in Dryer (1997) that the notion of possible language is seriously problematic, that the set of possible human languages is really a fuzzy set and that the kinds of properties that supposedly define the set of possible languages are really properties with varying degrees of probability, that languages simply become less frequent as one moves away from properties that are most commonly found among languages, and that a major component of characterizing (and ultimately explaining) the way languages are involves characterizing which properties are more common than others (rather than characterizing what is possible and what is not possible). I argue that a metalanguage that can describe all that we find in languages is quite inadequate in characterizing what languages are like because it must be powerful enough to describe everything we find, but will then not characterize what is common or normal in language.

A large part of typological theory involves substantive notions that are required to describe languages in such a way that one can see what it is about individual languages that is shared with many other languages and what is more unusual. Many of these substantive notions are ones that already existed in the implicit theory of traditional grammar, notions like noun and adjective, subject and object, case and verb agreement. Other notions, like ergativity, split intransitivity, head marking, dependent marking, applicative constructions, or core versus adjunct are ones that are similar in spirit to notions from traditional grammar but involve extensions or refinements motivated by language types or types of phenomena that go beyond traditional grammar. Much of this typological work is often viewed by formal linguists as atheoretical, precisely because of the assumption of formal linguists that linguistic theory requires a metalanguage for describing languages. Under the formal view, a "theory" of ergativity involves describing ergativity within a formal metalanguage, either in terms of existing mechanisms in the metalanguage or in terms of extensions to the metalanguage. But this usually involves restating a descriptively adequate account within a metalanguage that is claimed to be necessary to achieve explanatory adequacy. In other words, the supposedly atheoretical descriptions are viewed as atheoretical only because they are assumed to fail at the level of explanatory adequacy. However, since I have argued above that attempting to design metalanguages that achieve explanatory adequacy is misguided from a functionalist point of view, the supposed "theories" of phenomena like ergativity add nothing theoretically to the supposedly atheoretical work which they are claiming to "formalize". In terms of describing the variation we find in language, the typological work is just as theoretical, and since the typological work is based on actually investigating what variation exists among languages, while the restatement in a formal metalanguage is nothing more than a translation, it is really the typological work rather than the formal theoretical work that is theoretically substantive.

I have made a distinction between the theoretical goal of describing the variation we find among languages (including limits on that variation) and the theoretical goal of explaining this variation. This distinction is one that is collapsed in formal theoretical work, precisely because, as discussed above, it is assumed in formal theory that we describe the variation by designing a metalanguage that can describe languages, and we explain the limits on the variation in terms of limits on what the metalanguage can describe. Thus, on a formal theoretical view, designing the metalanguage is viewed as constructing a theory both of what variation exists and explaining that variation. But since under a functionalist view one cannot explain why languages are the way they are in terms of the choice of metalanguage, theories of what languages are like and explaining why they are the way they are are two very different things.

The choice of metalanguage can be relevant, therefore, relative to the goal of a theory of what languages are like. Describing a language without reference to notions that are useful in characterizing differences among languages is less useful than describing a language the does make reference to such notions. Hence, choosing a metalanguage that employs a set of notions that are useful in this respect does have theoretical consequences. However, the relevant choice of metalanguage does not

involve the sorts of formal notions that typically characterize formal theories, but rather their substantive vocabulary. Many descriptions of American Indian languages from the structuralist era are opaque precisely because they attempt to describe the languages with little reference to notions that are employed in describing other languages. To the extent that employing vocabulary that is used in describing other languages helps to bring out what is typical and what is unusual about a language, the choice of metalanguage does have theoretical consequences relative to the goals of typological theory.

6. Two notions of "formal"

Formal linguists often describe translations of descriptions into the metalanguage of a formal theory as "formalizing" a particular claim. There is confusion surrounding this, however, because the term "formal" is used in (at least) two distinct ways by linguists. In one sense, "formal" contrasts with "functional" or "descriptive" or "typological". This is the sense in which I have been using the term in this paper. There is a second sense, however, in which "formal" means something like "explicit", and the verb "formalize" is often used with this sense in mind. However, formal linguists seem often to intend two distinct things by "formalize", one that of translating something into a formal theory in the sense of formal metalanguage, the other that of describing a phenomenon more explicitly or precisely than it had been described before. I have already argued that from a functional point of view, translation into a formal metalanguage serves no useful theoretical purpose. However, it is difficult to argue against the value of being explicit in one's description.[7] The assumption among many formal linguists that descriptions in a formal metalanguage are more explicit than the "informal" descriptions found in descriptive grammars is a puzzling one. For one thing, much of the work in the Chomskyan traditions of the 1980s and 1990s is not only inexplicit in many ways, but these traditions seem to be have abandoned any interest in explicitness. Among formal theories, work in Generalized Phrase Structure Grammar (Gazdar, Pullum and Sag 1985) and Head-Driven Phrase Structure Grammar (Pollard and Sag 1994) aims far more at explicitness. But if one compares descriptive grammars written by missionaries to grammatical descriptions of phenomena in the metalanguages used by formal linguists, it is usually difficult to justify any claim that the former are less explicit. While the descriptive grammars may be vague in certain respects, the descriptions in formal metalanguages are rarely any less vague. There is one important reasons why informal descriptions are often more explicit than ones in formal metalanguages: the former are expressed in English, whose semantics is known to readers, while the latter are expressed in formal metalanguages whose semantics are rarely explained. There is a long tradition in linguistics of thinking that by using lots of funny-looking symbols, one is somehow being more explicit, but the truth is that one is usually being less explicit, since the meaning of the funny-looking symbols is rarely explained, or whatever explanation is offered is vaguer than if an attempt were made to describe the phenomenon in English. If one compares Matthews' (1965) description of Hidatsa within 1960s-style generative grammar with Li and Thompson's (1981) *Mandarin Chinese: A Functional Reference Grammar*, there is little question that the latter is far more explicit than the former. In fact, it is difficult to find *any* missionary grammar from the 19th century which is an inexplicit as Matthews' description of Hidatsa. While formal linguists are often to be complimented on their attempts at explicitness, there is little evidence that they have contributed much to the degree of explicitness in describing languages.[8] Thus, while the development of

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[7] Though many functionalists seem to object to explicitness, partly, I believe, because they have fallen victim to the ambiguity in "formal": they think that objecting to formal linguistics also implies objecting to formalizing in the sense of making explicit.

[8] Again, I would have to say that it is not clear that this criticism applies to HPSG.

metalanguages as theories seems to be partly motivated by a desire to achieve explicit descriptions, more often than not it fails to do so.

7. Conclusion

I have argued in this paper that the term 'theory' is widely used by formal linguists to denote metalanguages for describing languages but that such metalanguages are not an essential part of what it means to be a scientific theory, that metalanguages are irrelevant to linguistic theory if one adopts assumptions associated with a functional view of language. In this conclusion I want to bring these arguments together by focusing on the extent to which the notion of metalanguage as theory is not only tied to a formal view of language but more specifically to the particular views of language espoused by Chomsky.

We can distinguish three kinds of explanatory goals in linguistics, tied to the time at which the crucial events are taking place. One of these is the time of utterances: we want to explain what underlies linguistic behaviour. The second is the time of language acquisition: we want to explain how it is that children acquire knowledge of language. And the third is explaining why languages are the way they are. Under a functionalist view of language, the crucial explanations for why languages are the way they are are tied to events that take place during language change. Under a Chomskyan view of language, in contrast, explanations for why languages are the way they are are tied to the time of language acquisition: the innate linguistic knowledge defines why languages are the way they are and governs the nature of language acquisition.

Under a Chomskyan view, a single metalanguage simultaneously represents a theory governing all three of these explanatory goals. The metalanguage is a theory of innate linguistic knowledge, and thus serves as a theory of why languages are the way they are and as a theory of language acquisition. And since the grammar underlying linguistic behaviour is viewed as the innate knowledge plus a filling in of specific details of the particular language, the metalanguage constituting the innate knowledge also serves as the framework or skeleton of the knowledge underlying linguistic behaviour and thus is the major component of a theory of such behaviour.[9]

Under a functional view, a theory of why languages are the way they are is fundamentally a theory of language change: all three of the examples discussed above in section 3 involve theories where the crucial events take place at the time of language change. This is not to say that the factors they assume play no role in language acquisition and language use. To the contrary, the events that take place at the time of language change depend completely on events that take place in language acquisition and language use. Consider, for example, the theory discussed in section 3.1 that one factor underlying word order correlations is that languages with typologically unusual combinations of word orders more often have structures that are more difficult to parse. The crucial type of event that takes place at the time of language change is that language changes, under the hypothesis, occur more often in the direction of consistent direction of branching than in the direction of inconsistent direction of branching. But these

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[9] Newmeyer (1992) discusses a fourth crucial time in linguistic explanation: the time of the biological evolution of the innate linguistic knowledge. Clearly, under a Chomskyan view, this does play a crucial role in explaining why languages are the way they are, in some ways the most crucial role. Under a functionalist view, this endeavour is irrelevant, since it assumes innate linguistic knowledge, but one could also ask questions about the biological evolution of the general cognitive mechanisms governing language acquisition and language use. It is quite possible, perhaps even probable, that to some extent, certain aspects of these general cognitive abilities have been shaped by their advantages for language acquisition and language use, and that to that extent, labeling them simply as general cognitive mechanisms is misleading. But investigating this issue is necessarily so wildly speculative that it is not clear that anything can be said of scientific value.

events are also due in turn to events in language acquisition and language use. Constructions involving mixed branching will be slightly more difficult to learn because of the problems in parsing instances of them. To a certain extent, speakers will tend to avoid using structures with mixed branching (as in *the Queen of England's crown*), which can lead eventually to their passing out of the language. In addition, speakers may occasionally produce utterances that are not grammatical, motivated by the need to express some meaning without using a confusing structure, and these may eventually become sufficiently common as to be incorporated into the language. And constructions in contact languages that involve more consistent branching will be more likely to be borrowed into a language. But language change is the primary locus of explanation because the effect of mixed branching on individual instances of acquisition and use will be fairly small, and change will only occur when, for whatever reasons, a cumulative effect of these small effects leads to change. The pressure must be sufficiently small as to allow languages to continue with mixed branching for hundreds of years (as is the case with Mandarin Chinese). The effect of the pressure will only show up statistically after thousands of years reflected by the existence of a greater number of languages with consistent branching than with mixed branching.

An analogy from biological evolution may be useful here. It is generally assumed that many properties of the human hand help serve its functions and that the evolutionary pressures over millions of years have led to these properties. The fact that these advantages help individuals in their own survival plays a minor role in causing these properties to continue. People develop hands because it is in their genetic code. Analogously, the languages that people speak are largely predetermined before acquisition: people learn these languages because the languages already have the properties they have before speakers start to learn them. But just as people acquire hands that have useful properties that were determined over the millennia of biological evolution, so too the languages that people learn already have the communicative advantages that have developed over thousands of years of the evolution of the particular language they are learning. Just as the functional advantages of the properties of hands play a minor role in encouraging those properties to continue, so too the functional advantages of languages play a minor role in encouraging those properties to continue. It is in this sense that the primary locus of functional explanation is at the time of language change and at the level of the evolution of particular languages.

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