

The Classification of Constituent Order Generalizations and Diachronic Explanation

1. Introduction

Greenberg's (1963) constituent order generalizations have long been a battleground for opposing modes of linguistic explanation. Diachronic explanations for some of the generalizations begin with Givon's pioneering work (1975, 1979) and are the focus of Aristar (1991). The much larger catalogue of proposed explanations based on synchronic considerations - including constraints imposed by language processing or discourse function - range from Hawkins' (e.g. 1983) processing-based accounts to much work in the generative tradition, most recently Kayne (1994) and research inspired by Kayne's antisymmetry program. Apart from etiology, the Greenbergian¹ generalizations have also been subject to various classificatory schemes, usually based on internal properties such as complexity (implicational versus unconditional universals) or strength (statistical versus absolute universals). This paper proposes a different classification of the Greenbergian constituent order universals, which extends naturally to larger compendia (e.g. Dryer 1992, Plank 2003, Haspelmath et al 2005). Based on this classification, I suggest that the best known generalizations of this type, cross-categorical universals, arise most plausibly through language change (and thus are usually statistical). Two other types, which I label hierarchical and derivational universals, are true candidates for principles of synchronic grammar.

2. The classification

Setting aside their logical or evidential properties to examine Greenberg-style constituent order generalizations in terms of the kinds of linguistic data they cover, I propose to distinguish three subtypes:

(1) Constituent order generalizations (universals)

- a. **Cross-categorical generalizations** reference the internal properties of two or more categories irrespective of their relationship in a particular structure.
- b. **Hierarchical generalizations** describe the relative position of two or more categories in a single structure.
- c. **Derivational generalizations** describe the relative position of two or more categories at the end of a syntactic derivation.

Cross-categorical generalizations are the best known in the Greenbergian inventory. They are the main topic of Hawkins' 1983 monograph and subsequent work, and the specific focus of constructs in generative grammar such as the Head Parameter (Chomsky 1981). In much typological work, the significant and interesting

¹ The descriptor is due to Dryer (1992). I intend it here to apply both Greenberg's own generalizations about constituent order and similar generalizations by others.

Greenbergian generalizations are held to be precisely the cross-categorical generalizations (what Dryer 1992 calls the Greenbergian correlations). I will argue that this focus on cross-categorical generalizations, in formal and functional work alike, has led to a certain skewing of linguists' expectations about what a prototypical syntactic universal should look like: for example, that it should be statistical.

Greenberg's Universal 3 is an example of a **cross-categorical** generalization:

Universal 3. Languages with dominant VSO order are always prepositional. (Greenberg 1966: 78).

Universal 3 correlates constituent order internal to one category (S; that is, the clause) with constituent order internal to another (PP; that is, adpositional phrases). Such generalizations hold regardless of the structural relationship between the two categories; for example, instances of category S may or may not contain PP, but this relationship is irrelevant to the interpretation of Universal 3.

Hierarchical generalizations refer to the relative position of two categories within a single syntactic structure. Greenberg's Universals 1 and 14 are hierarchical universals:

Universal 1. In declarative sentences with nominal subject and object, the dominant order is always one in which the subject precedes the object.

Universal 14. In conditional statements, the conditional clause precedes the conclusion as the normal order in all languages. (Greenberg 1966: 78).

Greenberg formulated Universals 1 and 14 to specify the relative order of pairs of categories (subject, object; conditional, consequent) in a single structure. Greenberg's formulations reference linear order, not structural position, but the categories he refers to stand in a fixed hierarchical relation at some level of representation in many structurally-oriented theories of grammar. Two notions are relevant here. The first is the idea that there is some relationship between the structural positions of two constituents and their linear order. This idea is controversial, but there are some broad points of relative consensus. For example, Universal 1 follows, at an appropriate level of representation, if (i) subjects originate in the specifier of a projection that contains the object, and (ii) specifiers always precede their heads:

(2) [_S Specifiers [_{VP} precede heads and complements]]

Likewise, the conditional clause can be held to occupy a higher structural position than the consequent in conditional statements, again at an appropriate level of representation, if conditionals are generated in the specifier of a projection that contains the consequent clause:

(3) [_{S'} If conditionals are specifiers of S' [_S they precede the consequent]]

The second key notion is the idea of appropriate level of representation. Greenberg's interest, of course, was in surface constituent order, a tradition maintained in most

typological research. Neither Universal 1 nor 14 holds as an absolute universal about surface order across languages. Universal 1, for example, has been known to be statistical, not absolute, as a characterization of surface constituent order, since the first studies of object-initial languages (Derbyshire 1977). I will argue, however, that these universals are absolute when applied at an appropriate level of representation.

I have defined hierarchical and derivational universals in (1b-c) in such a way that the latter are actually a subcase of the latter. In practice I will restrict hierarchical universals to cases where underlying constituent order is key to explaining Greenberg's generalization.

Derivational generalizations also involve ordering relations between categories in a single syntactic domain, but they refer to relative position at the end of the syntactic derivation. This classification is unavoidably theory-internal: it requires a theory where surface word order is syntactically derived. Let us take Greenberg's Universal 7 as example.

Universal 7. If in a language with dominant SOV order, there is no alternative basic order, or only OSV as the alternative, then all adverbial modifiers of the verb likewise precede the verb. (This is the rigid subtype of III.).

Universal 7 is a derivational generalization within a framework such as Kayne's (1994). On Kayne's approach, underlying word order is universally SVO. OV order can be derived in two ways: by fronting the object (and perhaps other core grammatical arguments), or by fronting the VP, minus the verb. The first option derives the S-O-V-Other order found, for example, in Mande (Gensler 1994), as in (4). The second option derives Greenberg's 'rigid subtype' of SOV (Type III), as in (5).

(4) S XP O V to YP

(5) S [XP O t_V YP ...]_{VP} V t_{VP}

Since the option in (5) derives OV order by fronting the VP around the verb, it necessarily fronts all constituents within VP, including adverbs, as well. Universal 7 can be interpreted as a derivational universal because the universal crucially references constituent order after the pattern in (5) has been derived.

Note that Universal 7 has the form of an implicational universal, just like Universal 3. But Universal 7 refers to the relative ordering of elements within a single clause, while Universal 3 refers to the position of elements in distinct domains (V in S, P in PP). In this paper I argue that derivational generalizations, like hierarchical generalizations, are candidates for true universals.

In the following section I briefly discuss the statistical status of the Greenbergian generalizations. Section 4 examines the status of the apparently strongest cross-categorical generalizations. Sections 5 and 6 examine derivational and hierarchical generalizations respectively.

3. Statistics

The status of “statistical” versus “absolute” universals is widely discussed in the typological literature, with some linguist arguing (e.g. Dryer 1997) that all meaningful universals are statistical. As pointed out by Aristar (1991), non-absolute generalizations are poor candidates for synchronic explanations based either on universal grammar or categorical cognitive principles such as processing constraints (1991: 4). I believe that Dryer and Aristar are right in asserting that cross-categorical constituent order generalizations are inherently statistical. However I will suggest that in this regard they are quite distinct from the other two types of universal distinguished above.

Let us begin by examining the veridical status of Greenberg’s own generalizations. The universals that I classify as cross-categorical are listed in Table 1 with the statistical status assigned to them by Greenberg.

Table 1. Greenberg’s Crosscategorical Generalizations

#	Universal (Greenberg 1966)	Strength
2	In languages with prepositions, the genitive almost always follows the governing noun, while in languages with postpositions it almost always precedes.	almost always
3	Languages with dominant VSO order are always prepositional.	always
4	With overwhelmingly greater than chance frequency, languages with normal SOV order are postpositional.	overwhelmingly greater than chance
5	If a language has dominant SOV order and the genitive follows the governing noun, then the adjective likewise follows the noun.	always
9	With well more than chance frequency, when question particles or affixes are specified in position by reference to the sentence as a whole, if initial, such elements are found in prepositional languages, and, if final, in postpositional.	well more than chance
12	If a language has dominant order VSO in declarative sentences, it always puts interrogative words or phrases first in interrogative word questions; if it has dominant order SOV in declarative sentences, there is never such a rule.	always
13	If the nominal object always precedes the verb, then verb forms subordinate to the main verb also precede it.	always
15	In expressions of volition and purpose, a subordinate verbal form always follows the main verb as the normal order except in those languages in which the nominal object always precedes the verb.	always
16	In languages with dominant order VSO, an inflected auxiliary always precedes the main verb. In languages with dominant order SOV, an inflected auxiliary always follows the main verb.	always
17	With overwhelmingly more than chance frequency, languages with dominant order VSO have the adjective after the noun.	overwhelmingly more than chance

18	When the descriptive adjective precedes the noun, the demonstrative and the numeral, with overwhelmingly more than chance frequency, do likewise.	overwhelmingly more than chance
21	If some or all adverbs follow the adjective they modify, then the language is one in which the qualifying adjective follows the noun and the verb precedes its nominal object as the dominant order.	always
22	If in comparisons of superiority the only order, or one of the alternative orders, is standard-marker-adjective, then the language is postpositional. With overwhelmingly more than chance frequency if the only order is adjective-marker-standard, the language is prepositional.	always (part 1); overwhelmingly greater than chance frequency (part 2)
24	If the relative expression precedes the noun either as the only construction or as an alternate construction, either the language is postpositional, or the adjective precedes the noun or both.	always

Fourteen of Greenberg's twenty-five exclusively syntactic generalizations are cross-categorical. Eight of these are characterized by him as exceptionless: 3, 5, 12, 13, 15, 16, 21, and 24. Only two of the twenty-five syntactic generalizations are hierarchical, 1 and 14. According to Greenberg, the first of these is statistical, the second absolute. As noted above, the apparent paucity of hierarchical universals is directly related to the role of derivational universals: derived orders obscure hierarchical generalizations. In §5, I classify seven of Greenberg's twenty-five syntactic generalizations as derivational (6, 7, 10, 11, 19, 20, and 25); all of these are exceptionless. In §4, I show that the difference in strength between cross-categorical and derivational generalization is even sharper than Greenberg's paper indicates. Subsequent research shows that all of the eight cross-categorical universals classified by Greenberg as exceptionless are in fact statistical.

Similar results are provided by a larger sample of proposed language universals. The Konstanz Universals Archive (Plank 2003) turns up 430 records on a keyword search for 'order'; of these some 269 are generalizations about syntactic constituent order. 154 of the constituent order generalizations are cross-categorical; of these 106, just over two-thirds, are identified by the archive compilers as statistical. Of the remaining 48 constituent order generalizations classified as 'absolute', a substantial number have counterexamples noted by the database compilers or previous researchers, indicating that they are, in fact, statistical, although originally proposed by their authors as absolute.

4. Cross-categorical generalizations

I suggested in the previous section that all cross-categorical constituent order generalizations are statistical. As noted there, virtually all of the eight cross-categorical generalizations classified by Greenberg (1963) as exceptionless have since been found to be statistical.

Greenberg himself (1963: 107) notes Papago as an exception to Universal 3; further counterexamples are provided by Payne (1986), while Dryer in Haspelmath et al (2005) lists 6 languages which are postpositional with dominant VSO order (out of a total of 38 postpositional languages with dominant VO order).

Universal 5 is a nested conditional: the population of languages that are OV and that have noun-genitive order is very small to begin with (Dryer 1992). Even so, Plank (2003) attributes to Dryer the observation that Tigre counterexamples Universal #5. Tigre has OV, noun-genitive, and adjective-noun order, as shown in (6):

(6) **Tigre NP internal order** (Raz 1983: 95)

- a. Galab 'ət 'ətyopya latətrakkab [hatte nə'is dægge] ta.
Galab in Ethiopia which is found one small town is
'Galab is a small town which is found in Ethiopia.'
- b. 'Aze hatte mə'al 'ət [həday 'ad wa'aga] fararaw.
Now one day to wedding party family guenon they went out
'One day they went out to the wedding party of the family of the guenon.'

Universal 12 is a cross-categorical universal because it correlates the word order properties of two distinct categories (in this case, sentence types): interrogative and declarative clauses. It is statistical. Dryer in Haspelmath et al (2005) lists 16 VSO languages which do not place *wh*-phrases in initial position in content questions, as opposed to 42 which do. 52 SOV languages have initial *wh*; 225 SOV languages do not.²

Counterexamples to Universal 13 have not been widely discussed, but they occur in Tibeto-Burman languages classified by Greenberg as the 'rigid subtype' of Type III (SOV), such as Burmese. The relevant pattern involves 'fore-and-aft concatenations' (Matisoff 1973: 248), where a subordinate verb appears on either side of the higher verb, depending on its meaning. For example, Burmese (SOV) *pè* 'give' follows the subordinate verb when it is interpreted as a benefactive (the pattern predicted by Universal #13), but precedes when interpreted as a permissive causative:

(7) **Burmese *pè* benefactive/causative**

- a. Canáw kà maunlèi ko màun pè-dɛ.
I NOM boy DAT/ACC drive give-REAL
'I drove for the boy, I did the boy the favor of driving.'
(Modified from Okell and Allot 2001:120)
- b. Canáw kà maunlèi ko pè màun-dɛ.
I NOM boy DAT/ACC give drive-REAL
'I let the boy drive.'

Along these same lines, exceptions to Universal 15 are cited by Dryer (1992: 94), and to 16, 21 and 22 by Pickett (1983)³ (the authors of these counterexamples are noted in Plank 2003).

² The figures were obtained using the extremely useful interactive CD accompanying Haspelmath et al (2005), which allows searches for combined features such as constituent order and position of *wh*-phrase.

³ Pickett (1983: 540) cites Yaqui, Mixe, and Zoque as counterexamples to the second part of Universal 16: in these languages, at least some varieties of which she classifies as Greenberg's Type III (OV, postpositional), the inflected verb 'be able' precedes the main verb. She cites Mixe and Seri as counterexamples to Universal 21 (1983: 544): these languages have Adjective - Adverb and Noun -

Suppose, then, that it can be established that all cross-categorial constituent order generalizations are statistical. What does this say about the status of these generalizations in grammar? There are two views about this. Since the 1980s, one prominent view has held that cross-categorial correlations (to use Dryer's term) are the reflex of a parameter of universal grammar, the Head Parameter. This approach would explain Universal 4, for example, by claiming that children set a single value [final] for the categories VP and PP in acquiring a language such as Burmese:

(8) **Burmese VP, PP**

- a. [kà màun-tɛ]_{VP}
car drive-REALIS
'drive a car.'
- b. [Yankon ko]_{PP} θwà-tɛ
Rangoon to go-REALIS
'(go) to Rangoon.'

The problems with this approach are well known, however. First, recall that the relevant generalizations are statistical, so there are exceptions. Persian is OV but prepositional:

(9) **Persian (OV) prepositions** (Windfuhr 1987: 534)

- [be mán]_{PP} dād
to me gave
'Pro gave it to me.'

Other languages have mixed values for the closed-class category P: Amharic and Chinese, for example, have both prepositions and postpositions.

(10) **Chinese prepositions and postpositions**

- a. Quánbù [cóng Měiguó]_{PP} lái.
All from U.S. come
'All come from the U.S.'
- b. [Zhuōzi shàng]_{PP} yǒu yī tái pò suì de diànnǎo
table on is 1 CL broke COMP computer
'On the table is a broken computer.'

Crucially, there is no evidence that 'exceptional' languages such as Persian or 'mixed' languages such as Chinese are more difficult to acquire, or that delays occur in the acquisition of the exceptional or mixed category types. Evidence from first language acquisition suggests that acquisition of basic word order is very early, regardless of the word order properties of the target language (Wexler 1998). These facts have contributed to a rejection of the Head Parameter as a component of universal grammar (Kayne 1994, Newmeyer 2005).

The second approach to explaining cross-categorial constituent order generalizations appeals to diachronic processes. Givon (1984), for example, points out

Adjective but O - V order. She cites Tepehua (1983: 542) as a counterexample to Universal 22: this language has standard - marker - adjective order in comparatives, but it is prepositional.

that adpositions are frequently derived from serial verbs. In VO languages, this results in prepositions, while in OV languages it results in postpositions. Adpositions also develop from relational nouns; thus the ‘mixed’ property of Chinese PPs is the historical consequence of prepositions derived from verbs such as *cóng* ‘from’ in (8a) (Chinese is VO) and postpositions derived from relational nouns such as *shàng* ‘on’ in (8b) (Chinese is Modifier – Noun).⁴ Complementizers and auxiliaries are well known to have similar sources; a very simplified sketch of this kind of development is given in Table 2, with examples, mostly well known, from English.

Table 2. ‘Grammaticalization’ Type Crosscategorical Shifts

Category	Source	Example
Comp	Verb	English <i>have</i> > <of> in <i>I should of gone</i> (Kayne 1997)
Comp	Adposition	English <i>for</i> + infinitive
Aux	Main verb	English <i>will</i>
P	Verb	English <i>like</i>
P	Relational Noun	(6b)

This diachronic mode of explanation predicts that PP and VP internal order will be consistent in a language to the extent that adpositions have a diachronic source from verbs. Mixed orders such as Chinese (8) result when VP and NP vary in head-complement order and Ps derive from both. The source of Persian [P NP] order is complex, but the Modern Persian preposition *be* results from reanalysis of a preverb *bē* and an earlier preposition *ō* (Lazard 1986).⁵ But whatever the historical source of the ‘mixed’ or ‘exceptional’ cross-categorical pattern, this diachronic information is nowhere in the synchronic grammar, and is irrelevant to the child acquiring Persian or Chinese. First language learners are able to acquire any of the three patterns, unaided by parametric information of the X-bar theoretic type.

Aristar (1991) objects that this mode of explanation may work for the kinds of correlations in Table 2, where there is a clear diachronic ‘path’ from a lexical category (Verb, Noun) to a closed-class category (Adposition, Complementizer). But what about correlations across the lexical categories N and V? A common position in the generative literature is that relative head-complement order tends to hold across NP and VP as well, yielding ‘consistent’ values for the Head Parameter in languages that are ‘strictly head final’ (Korean) or ‘strictly head initial’ (Tagalog). Accepting this conclusion, Aristar attempts to construct a diachronic scenario for explaining word order correlations across NP and VP.

But there is good evidence that this attempt is mistaken. Dryer (1992), using a far larger sample of languages than Greenberg, shows that Noun-genitive and Noun-relative order does not correlate with Verb-complement order, while P-complement order does. This result is extremely significant for the argument that cross-categorical word order generalizations have a diachronic source: cross-categorical generalizations about constituent order hold in just the case where grammaticalization is abundantly

⁴ See Whitman and Paul (2005) for a description of the derivation of the preposition *cóng* ‘from’ a verb meaning ‘follow, accompany’.

⁵ I am indebted to Michael Weiss for explaining the Persian diachronic facts and introducing me to Lazard (1986).

attested (e.g. Verb, Adposition). Where paths of grammaticalization are rarer or arguably nonexistent (Noun Phrase, Verb Phrase), cross-categorical generalizations do not stand up. Dryer's results further strengthen the view that significant cross-categorical word order generalizations arise through language change.

It remains the case that the veridicality of some cross-categorical generalizations is very high; some appear to have only small numbers of counterexamples. Thus as we have seen, Plank (2003) cites no counterexamples to Universal 13, although we were able to cite the Burmese pattern in (7) and Matisoff's (1973) more general discussion of such patterns in Tibeto-Burman. In such cases, we must imagine that the diachronic combination of circumstances that give rise to the counterexemplificatory pattern is relatively rare.⁶ For example, patterns such as (7) with order O - main verb - subordinate verb in strict OV languages seem to be restricted to serializing OV languages (see Carstens 2000 for similar examples from Ijo). Both the benefactive pattern in (7a) and the causative pattern in (b) are diachronically derivable from coordinate structures; the order of 'give' and the accompanying verb is determined by the temporal order of events in the source coordinate structure:

(11) a. buy the food and give the boy *pro*_{food} > buy give (benefactive)

b. give the boy the food and *pro*_{boy} eat *pro*_{food} > give eat (> permissive)

(See Newman 1996 for the development from permissives to causative).⁷ On this analysis, the two complementation patterns in (11), both attested in Burmese (7) with the same verb 'give', are simply the result of the two different diachronic sources for the pattern, both from coordinate structures. When 'give' comes second in the coordinate source structure, grammaticalization of 'give' yields a benefactive verb. When 'give' comes first, grammaticalization yields a permissive. Both patterns preserve the basic argument structure of the source coordinate structures: in the benefactive (11a), the subject of 'give' is also the subject of 'buy'; in the permissive (11b), the goal of 'give' is the subject of 'buy'. The typological rarity of the pattern reflects two factors: the relative rarity of strict OV serializing languages (Schiller 1990: 396) and the analogical pressure imposed by coexisting verb - causative patterns in the same languages.

5. Derivational generalizations

Following the same strategy as in the preceding section, in this section I examine the derivational universals 6, 7, 10, 11, 19, 20, and 25, all characterized by Greenberg as exceptionless.

Universal 6. All languages with dominant VSO order have SVO as an alternative or as the only alternative order.

⁶ The insight that typologically 'oddities' - exceptionally rare syntactic or morphological patterns - may result from combinations of historical circumstances which are each themselves relatively rare is due to Alice Harris (this volume).

⁷ Newman (1996) suggests that a purposive structure such as 'buy the book to give to the boy' may be an intermediate stage in the development of 'give' to a permissive causative. But Tibeto-Burman gives no evidence for postverbal purposive structures.

This universal has apparently remained unchallenged in the literature subsequent to Greenberg. The derivational relationship between VSO and SVO is directly accounted for on the verb raising analysis developed in the transformational literature (Emonds 1980, Sproat 1984, McCloskey 1991). Under this approach, VSO order is derived by raising the verb over the subject out of a constituent VP. SVO order is predicted to occur in contexts where verb raising is blocked, such as non-finite clauses. In fact, from a derivational standpoint, the occurrence of SVO order is dependent on the existence of such contexts: if a VSO language lacks non-finite verbal constructions, we might expect it not to attest SVO order. On this interpretation, a refined version of Universal 6 might be as in (12):

- (12) All languages with dominant VSO order have SVO as an alternative order if they have non-finite structures; this is the only alternative order involving verb placement.

The label ‘derivational generalization’ might suggest that generalizations of this type are of interest only to transformational theories, and in the remainder of this section I will focus on transformational accounts. But in principle, any theory which maps between syntactically relevant levels of representation may capture the generalizations that I have called ‘derivational’. Thus the account of VSO order in languages such as Welsh in Lexical-Functional Grammar (Sadler 1997, Bresnan 2001: 127-131) relies on the mapping between f-structure (where the lexical verb is the predicate of the clause) and c-structure (where the finite lexical verb occupies the position of I(NFL), the head of the finite clause above the subject NP). This account too makes finiteness the crucial feature for predicting the occurrence of SVO order in predominantly VSO languages.

In §2 I described how Universal 7, repeated below, is captured in Kayne’s (1994) transformational account of constituent order variation.

Universal 7. If in a language with dominant SOV order, there is no alternative basic order, or only OSV as the alternative, then all adverbial modifiers of the verb likewise precede the verb. (This is the rigid subtype of III.)

However Kayne’s is not the only derivational account of Universal 7. Any analysis which shares the insight that units of clausal structure above the verb phrase, such as tense and subordination/clause type markers (complementizers), are present in Greenberg’s ‘rigid subtype’ of type III (strictly head-final) languages must posit a mechanism to account for the fact that the verb and these higher units of structure form an inseparable sequence at the surface level of representation. Under such treatments, the syntactically relevant representation for a tensed matrix clause will be something like (13), where the verb forms a sequence with the morphemes heading the finite clausal projection (I(nflectional) Phrase) and the projection specifying clause type (C(omplementizer) Phrase):

- (13) **Korean Tensed Interrogative**

Mica ka ecey ppalli muncey ul haykyelhay-]VP -ss-nun-]IP ya]CP
 Mica NOM yesterday fast problem ACC solve- PAST-ADNOM Q
 ‘Did Mica solve the problem fast yesterday.’

Whether the syntactic units in (13) are composed by transformational operations (Choe 1988, Koopman 2005), or by a post-syntactic morphological operation (Sakai 1998), the crucial properties of a representation like (13) are that (i) a higher level of structure than VP is present (ii) elements other than the heads in (13), such as adverbs, may not break up the sequence.⁸ The consequence of this representation is that adverbs following the verb must also follow the highest clausal projection, CP in (13). Such adverb positioning is perfectly possible in ‘strict’ type III languages (14), but it has the interpretation of a Right Dislocation or ‘afterthought’ construction, as predicted by (13), because it involves adjoining adverbs not merely to the verb phrase, but the entire clause.

(14) Mica ka muncey ul phul-ess-nya]CP, ecey / ??ppalli.
 Mica NOM problem ACC solve-PAST-Q yesterday fast
 ‘Did Mica solve the problem, yesterday/?fast?’

Summarizing, then, Universal 7 falls out as a derivational generalization in any framework which maps the verb in strict Type III languages to a surface position in or directly adjacent to the heads of higher clausal structure.

Universal 10. Question particles or affixes, specified in position by reference to a particular word in the sentence, almost always follow that word. Such particles do not occur in languages with dominant order VSO.

Universal 10 applies to yes/no (polar) questions. Greenberg (1963: 80-82) observes that question particles may be fixed by position in the sentence as a whole (initial or final), or by reference to some particular constituent, most often the verb, or the emphasized constituent in the question. Universal 10 applies to the later case, and has two parts. Greenberg finds that the first part holds for 13 of 14 languages which have Q particles of this type in his sample. He reports that in one, Yoruba, the particle precedes the constituent in reference to which its position is fixed (1963: 106, note 12), but this appears to be an error.⁹ The second part is claimed by Greenberg to be absolute: it states that Q particles of this type do not occur in VSO languages.

In generative treatments, initial and final Q particles have typically been analyzed as complementizers, the highest head in the clause. Some linguists have analyzed the type of Q particle addressed by Universal 10 in a similar fashion: these particles can be analyzed as heading a lower functional projection; the item by which the position of the

⁸ In principle an approach of this sort would be available in LFG as well, exactly parallel to Sadler’s (1997) and Bresnan’s (2001) treatment of VSO languages, where the inflected verb, corresponding to the predicate in f-structure, is inserted into a higher structural head position such as Comp(lementizer) or Infl(ection) in c-structure. In practice, LFG treatments of strict type III languages such as Sells (1995) have tended to adopt the position that such structural categories do not exist in these languages. This makes it unclear why the pattern in (14), for example, behaves like Right Dislocation, rather than right adjunction to VP.

⁹ Yoruba has polar Q particles both in final position, as noted by Greenberg, and initial position (Bamgboṣe 1966). The particle *ni*, which functions as a Q marker in final position, may also appear in second position, but in this position it is a focus marker, not a Q marker (Adéṣolé, to appear). I am grateful to Victor Manfredi for clarification of the Yoruba facts.

particle is fixed then moves immediately to its left (see, for example Julien 2003: 23 for Turkish) . There are several subcases of this: in a common one, as noted by Greenberg, the focus of the polar question moves into the specifier of the projection headed by the particle, Focus Phrase (15a). As observed by Dryer in Haspelmath et al (2005: 375), in such languages there is normally an alternate strategy for marking questions with no focus; often, in this case, the same particle occurs in peripheral position, as in (15-16) from premodern Japanese:

(15) Premodern Japanese polar question particle *ya*

[_{FOCP} [Tatu no kubi no tama] **ya** [_{VP} torite ofasitaru]] (*Taketori monogatari* c. 900)
 dragon GEN head GEN jewel Q taking came
 ‘Did (he) bring the gem on the dragon’s head?’

(16) [[Ware wo ba sir-azu] **ya**? (*Ise monogatari* c. 900)
 I ACC TOP know-not Q
 ‘Don’t you know me?’

The analysis in (15-16) represents *ya* as a phrasal head in both patterns, in construction with the focus or range of the question in both (in (15) ‘gem on the dragon’s head’, in (16) the entire clause).

This treatment of Q particles makes two predictions with respect to Universal 10 as stated by Greenberg. First, it predicts that when the position of the particle is determined by a particular constituent, the particle should follow. This follows from the principle that specifiers precede their heads, a central consequence of Kayne’s (1994) theory of the relationship between phrase structure and linear order, but widely accepted outside that framework as well (cf. §2).

Second, the treatment of polar question markers as phrasal particles concurs with Greenberg that such particles should not occur in VSO languages – except in one specific configuration. This consequence follows from the Head Movement Constraint (HMC; Travis 1984: 131), which disallows movement of one head (such as a verb) past another. Recall from our discussion of Universal 6 above that VSO order is derived by movement of the verb to the highest clausal head position. Movement of the verb over a polar Q particle in a lower head position would violate the HMC, as shown in (17a). The specific configuration allowed by this account (but not found by Greenberg) is a VSO language where the Q particle itself occupies the highest position in the clause, and the verb moves and adjoins to it.

- (17) a. *[_V [_{FOCP} Q ... [_{VP} ... _{t_V} ...]]
 b. [_V+Q ... [_{VP} ... _{t_V} ...]]

In a sample of 777 languages, Dryer in Haspelmath et al (2005) finds 8 languages with polar question particles whose position is neither initial nor final.¹⁰ Of these 8, one,

¹⁰ Under the analysis of Q particles as phrasal heads, second position particles are a subcase of clause-initial particles, where the first constituent is moved into the specifier of the projection headed by the particle, or a phonological operation reorders the first word and the particle. Dryer reports 272 instances of final polar Q particles, 118 initial, 45 second position, and 8 ‘other position’ (2005: 374). The small number of ‘other position’ exemplars reflects the fact that if language allows both ‘other’ and initial or final position, the latter was chosen for coding as ‘neutral’.

(18) Tohitohi k-e kapitiga haau? (Seiter 1980: 26)
 write Q-ABS friend your
 'Is your friend writing?'

(19) Question particles or affixes, specified in position by reference to a particular word in the sentence, always follow that word. Such particles occur in languages with dominant order VSO only after the initial verb.

Only the first part of Universal 11 is derivational: it entails that subject/verb inversion in *wh*-questions will not occur when *wh*-movement does not. Inversion as a question marking strategy is genetically restricted to Indo-European and Uralic (Siemund 2001: 1025),¹¹ nevertheless Universal 11 appears to be a true substantive derivational universal. Evidence for this can be seen in the subset of languages with *wh*-movement and inversion in questions which have the partial *wh*-movement pattern in (20):

a. Was glaubst du [mit wem Maria jetzt spricht]? (McDaniel 1989)
What think you with whom Maria now talks
'With whom do you think that Maria is now talking?'

b. *Glaubst du [mit wem Maria jetzt spricht]?
think you with whom Maria now talks

Universal 19. When the general rule is that the descriptive adjective follows, there may be a minority of adjectives which usually precede, but when the general rule is that descriptive adjectives precede, there are no exceptions.

13

Universal 20. When any or all of the items (demonstrative, numeral, and descriptive adjective) precede the noun, they are always found in that order. If they follow, the order is either the same or the exact opposite.

A derivational account of Universal 20 is proposed by Cinque (2005), based on an assumed hierarchical universal: that the underlying order of elements in an extended nominal projection is as in (21):

(21) [Determiner [Number ['Indirect' Adjective Phrase ['Direct' AP [NP]]]]]

The main derivational constraints in Cinque's approach are (i) movement is only to the left (ii) NP or the phrase that contains it may move, but the other categories (Determiner, Number, AP) do not move independently of NP. NP-final configurations (the second part of Universal 19, the first part of Universal 20) result when nothing moves at all. The two orders referred to in the second part of Universal 20 are derived by fronting the NP alone within the larger nominal projection (preserving the relative order of modifiers), or by a 'roll-up' derivation, where NP moves to the left of AP, NP+AP moves to the left of Number, etc., reversing the relative order of modifiers

Universal 19 also can be stated as a derivational generalization referring to the hierarchy in (21). Cinque (2003) characterizes two kinds of languages which allow adjectival modifiers on both sides of the nominal head: (a) (i) languages like Italian, where NP normally fronts around 'Direct' AP modifiers, and (ii) the constituent ['Direct' AP [NP]] always moves around 'Indirect' AP modifiers; (b) and languages like English, where (ii) but not (i) occurs. As we saw above, languages with strict noun-final NP structure, such as Chinese or Korean, maintain the underlying structure in (21). This suggests the typology in (22):

- (22) a. (i) NP normally moves around Direct AP
- (ii) [Direct AP [NP]] moves around Indirect AP
- b. (ii)
- c. No movement

From this standpoint, Universal 19 is a substantive derivational universal which states that (i) and (ii) may occur in combination (a), or (ii) alone (b), or nothing (c), but that (i) does not occur alone.

Universal 25. If the pronominal object follows the verb, so does the nominal object.

Plank et al (2003) list this universal as absolute, with a question mark. The ten languages cited by Greenberg in support of Universal 25 all involve weak or clitic pronouns, or instances (e.g. Swahili) where the analysis of object pronouns as bound pronouns or concord markers remains controversial.

Among the many analyses of weak and clitic pronouns in structurally oriented theories of syntax, there are some clear points of consensus. One is that weak and clitic pronouns are nonbranching, word or X^0 -level categories. Cardinaletti and Starke (1999) refer to this as a 'structural deficiency'; more generally, it enables them to adjoin to other word level categories (as in Holmberg's 1986 account of Mainland Scandinavian object shift), or to be realized as the head of a functional projection containing VP (as in Sportiche's 1996 analysis of Romance object clitics). These structural options, all

involving positions to the left of the verb, are not available to full NP objects, which are branching, phrase-level categories. NP objects move to the left of the verb only as a consequence of operations which target objects in general.

In this section I have presented derivational accounts of 7 of Greenberg's constituent order generalizations. All of these universals have the form of hierarchical or derivational universals (that is, they reference the relative order of two or more categories in the same syntactic structure), and as all of them reference patterns that involve movement or dislocation in widely discussed syntactic treatments, I have classified them as derivational. Five of these (Universals 6, 7, 10, 20, and 25) follow directly from existing syntactic analyses, although to the best of my knowledge none of the authors of these analyses, with the exception of Cinque (2005), make direct reference to Greenberg's generalizations. Two more (Universals 11 and 19) do not to my knowledge have existing syntactic accounts, but lend themselves naturally to a formulation as substantive universals within such accounts.

6. Hierarchical generalizations

We observed in section 3 that Greenberg's original constituent order generalizations include only two that can be defined as hierarchical in the sense of (1b): Universal 1, which describes the relative order of subject and object, and Universal 14, which describes the order of conditionals and their antecedents. While 14 appears to be uncontested,¹² Universal 1 is a famously disproven generalization as a statement about surface order. Derbyshire (1977) and Derbyshire and Pullum (1981) cite numerous examples of object-initial languages, and VOS languages are also well attested from Austronesian and the Americas. Examination of the distribution of the six logically possible orders of subject, object, and verb, however, suggests that Universal 1 might be a valid hierarchical universal; that is, a generalization about underlying order.

Let us take as a point of departure an approach akin to Kayne's (1994) which derives surface word order from underlying SVO through four widely attested 'basic' operations: subject raising, verb raising, object shift, and VP fronting. These derive the five surface orders in (23)¹³:

(23) Derivation of 5 surface orders

	Surface	Underlying	Operation(s)	Moves
a.	SVO	SVO	subject raising	subject out of verbal projection
b.	VSO	SVO	verb raising	verb to left of clause
c.	SOV	SVO	object shift	object to left of verb ¹⁴

¹² It is often suggested that the explanation for unmarked antecedent - consequent order in conditionals is to be found in iconicity. If this were correct, we might expect to find languages where among realis (presupposed) conditionals, *after*-type presupposed conditionals always precede, and *before*-type conditionals always follow the consequent. I know of no such language.

¹³ Mark Baker (2001) also presents an account of constituent order typology that predicts the five types in (23), while disallowing OSV. To Baker is due the insight that of the two subject-final patterns, VOS should pattern with the two other VO types, while OVS should pattern with SOV (2001: 127-8). However Baker does not derive basic word order variation through movement operations. One consequence of this is that he is unable to explain the relative rarity of OVS languages (9 in Haspelmath et al's (2005) sample. In (23), OVS results from the co-occurrence of two relatively rare basic operations, object shift and VP fronting.

¹⁴ As noted in §2, strictly speaking, object shift derives SOVX order. Greenberg's 'strict subtype' of SOV languages, where all arguments and adjuncts precede the verb, require something like the kind of

- d. VOS SVO VP fronting VP to left of clause
- e. OVS SVO -> SOV object shift, VP fronting

The four operations in (23) indeed are attested in English (23c, object shift, at an earlier period of the language). Except for subject raising, however, the operations are optional in English; in other languages they are basic in the sense that they derive the word orders that typologists have identified as unmarked.

The basic operations in (23) leave only OSV order underived. The antiderivationalist skeptic may object, why not simply add a fifth operation of object super-shift, which moves the object to the left of the subject? The answer to this objection is that the two operations displacing NPs in (10) have very specific characteristics: they appear to displace argument NPs to positions where they continue to function as arguments (argument positions in the sense of Chomsky 1981). Displacement of non-subjects to the left of subjects is indeed robustly attested, but it targets non-argument positions: positions associated with questioned, focused, or topicalized constituents. In identifying ‘unmarked word order’, it is precisely argument positions that typologists seek to specify.

On this approach, then, OSV word order can only be derived by a non-‘basic’ operation, shifting the object directly to the left of the surface position of the subject. Dryer in Haspelmath et al (2005) identifies 4 OSV languages, Nadëb (Makú), Tobati (Oceanic), Warao, and Wik Ngathana (Pama-Nyungan). This is a significantly smaller number than the other O>S types, VOS (26) and OVS (9). Further inspection of the status of these 4 languages raises questions about the validity of the OSV analysis.

Nadëb is syntactically ergative (Silvana & Valteir Martins 1999: 263, citing Weir 1984: 89-91). Basic constituent order is determined by the placement of the absolutive or S/O argument: SV or VS in intransitives, OAV or AVO in transitives. Nadëb constituent order is thus best described as Abs-X-V, alternating with X-V-Abs¹⁵ Wik Ngathana also shows ergative properties (Sutton 1978).

In the two remaining languages, the OSV accounts contradict earlier SOV analyses. Donohue (2002: 198) suggest that a recent change SOV>OSV may have taken place in Tobati, since Cowan (1952) reported the language as SOV. But Donohue’s own data is also predominantly SOV in transitives with both S and bare O present (17 of 27 examples). The following examples of clause chaining suggest that OSV order in Tobati may not reflect the basic argument position of O:

derivation in (5) (Kayne 1994). But object shift appears to be the ‘basic’ operation that interacts with VP fronting to derive OVS languages; thus Hixkaryana is OVX, not OXV.

¹⁵ Ergativity is also relevant to the classification of the 9 OVS languages described in Haspelmath et al. Six are South American: Hixkaryana and Tirio (Cariban), Selknam (Chon), Cubeo (Tucanoan), Asuriní (Tupian), and Urarina (Urarinian). This suggests that the two basic operations associated with OVS order above, object shift and VP fronting, co-occurred (viewing them now as diachronic innovations) in a fairly circumscribed area on the eastern half of South America. From this standpoint, the three Eastern Hemisphere OVS languages are outliers. But they are outliers syntactically as well: all three have SV order in intransitive clauses, while all six South American languages are VS; the sole African language (Päri, Nilo-Saharan) is ergative, while of the two Australian languages, one has split person marking (Mangarrayi) and the other (Ungarinjin, Wororan) is described as accusative. SV order indicates that all three have a derivation quite different from the OVS South American languages, and at least the first two may be better described as having Absolutive -VX basic order.

(24) **Tobati** (Donohue 2002: 191)

- a. Man har-ad rom-ra yar.
bird person-ALL see-SEQ fly
'The bird saw the man and then flew off.'
- b. Man har rom-ra yar.
bird person-ALL see-SEQ fly
'The man saw the bird and then it flew off.'

What is interesting about (24) is that clause chaining is controlled by the first NP in the clause, regardless of whether it is subject (24a) or object (24b). Donohue suggests (personal communication) that allative marking on the object with *-(a)d* as in (24a) may in fact be the normal accusative pattern; bare objects (particularly definites and generics, judging from Donohue's data) are pervasively topicalized, and clause chaining as in (24) is controlled by the clause-initial topic. If this analysis is correct, the basic argument position of S and O in Tobati is SOV.

Similar considerations come into play for Warao. Romero-Figueroa disputes the earlier claim of Osborn (1962) that Warao is SOV. Like Donohue, Romero-Figueroa relies on consultants' translations of examples with reversible subject and object, specifically

- (25) Yatu hua mi-ya. (Osborn 1966: 260, Romero-Figuero 1985: 127)
you Juan see-pres
Osborn: 'You see Juan.'
Romero-Figueroa: 'Juan sees you.'

However difficulties arise with this kind of test in languages which typically topicalize discourse-presupposed NPs (such as discourse participants). In fact, one of Romero-Figueroa's primary sources, Vaquero (1965), directly contradicts Romero-Figueroa's claim about the unmarked order of reversible S and O. Vaquero states that when the meaning of the sentence would otherwise be unclear, order is SOV (1965: 157). A survey of transitive clauses with both unmarked S and O present in Vaquero's narrative texts reveals an overwhelming preference for SOV: 46 examples of SOV versus 4 of OSV.¹⁶ Virtually none of the examples of initial S are discourse-new or otherwise highlighted, casting doubt on Romero-Figueroa's claim that SOV is derived by focus fronting of S. Instead, as with Tobati, OSV appears to be the product of pervasive topicalization of definite and generic objects.

I have argued in this section that Greenberg's Universal #1 is a valid hierarchical universal, that is, accurate as a generalization about underlying constituent order. Crucial to this argument has been a claim that there is a high degree of congruence between what I have called 'basic' operations - operations that permute subject, object, and verb without affecting the argument status of the former two constituents - and the informal criteria that typologists use to identify basic word order.

7. Conclusion

Since Greenberg (1963), work on constituent order typology has tended to privilege the status of cross-categorical generalizations, in both 'formal' (particularly

¹⁶ I am indebted to Anne Gagliardi for the analysis of Vaquero's texts.

transformational) and ‘functionalist’ frameworks. In the former case, the longstanding appeal of X’-theoretic generalizations has surely played a role. If the argument developed in this paper is correct, cross-categorial generalizations of the X’-theoretic type are not the product of an imperative in Universal Grammar to favor, for example, consistency in head-complement order across categories, nor are they the product of pressures from language processing. Instead they are the result of well documented patterns of language change, which are common, but necessary or even favored, from the standpoint of acquisition or performance.

In an insightful discussion of the place of universals in syntactic theory, Newmeyer (2005) points out that cross-categorial generalizations such as the Head Parameter are a continuation of a longstanding effort to incorporate markedness considerations, in this case about syntax, into formal grammar. The argument in this paper that cross-categorial markedness generalizations such as the Head Parameter are not statements about synchronic grammar, but rather products of language change, can be compared to the critical assessments of markedness principles in synchronic phonology and morphology in the papers by Blevins and Garrett in this volume.

At the same time, this paper has left a very robust role for syntactic universals. I have argued that syntactic universals are to be situated in the exact areas of central interest to generative and indeed structuralist syntacticians: the underlying hierarchical arrangement of constituents and the constraints on mappings between levels of representation. These last were certainly not Joseph Greenberg’s main areas of concern in his research on constituent order generalizations, but I have argued that his most robust universals reflect them.

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