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CONSTITUENCY IN FREE WORD ORDER LANGUAGES¹**James Blevins****University of Massachusetts, Amherst**

Standard transformations canonically alter both the constituent structure and linear order defined by an input tree or stringset. This association of order and structure is clearly preserved in formulations of movement that advance an element into a distinguished initial 'position' which c-commands the constituents to its right. One consequence of using such devices to describe word order alternations is that word order variation within and across languages will typically reflect corresponding differences in constituency. This entails in turn that hierarchical structure in languages with relatively unconstrained word order conventions will be highly variable. Yet this structural variation is critically undermotivated, as there is little evidence that it interacts significantly with structure-sensitive rules.

In this paper I will sketch out a proposal for confining variation due to word order alternations to the principles that determine constituent order. Clauses and other major phrasal categories are assigned a high degree

of common hierarchical structure cross-linguistically, with free word order languages instantiating an articulated, though typically discontinuous, constituent structure. Holding constituency constant in this way supplies the requisite configurational domains for rules such as reflexivization, in addition to providing a means of extending configurational definitions of grammatical relations.

1 Word Order Typology

It will be useful at the outset to adopt a tentative taxonomy for classifying word order conventions. As a first approximation, let us identify the gross class of 'free word order' languages as those languages in which constituent order or even word order is pragmatically rather than syntactically distinctive. Word order will be said to be pragmatically distinctive within a language whenever there are multiple grammatical and synonymous (or at least truthconditionally equivalent) orderings of the elements of a transitive clause in that language. By contrast, in languages with syntactically distinctive word order, such as English or Chinese, permutation of major clausal constituents will typically result in a nonsynonymous or ungrammatical sentence.

The languages that exhibit constituent order alternations can be further cross-classified. On the one hand, the relative order of constituents may be largely unconstrained within a phrase. In this case, the language will be said to allow free constituent permutation. On the other hand, a language may tolerate free mixing of the constituents of different phrases. Languages that permit this pattern will be described as exhibiting free constituent intercalation. Because the most familiar examples of free word order languages, Dyirbal, Latin and Warlpiri, happen to allow both free permutation and intercalation, there has sometimes been a tendency to collapse these two ordering patterns. Nevertheless, it is reasonably clear that these properties not only can, but must be separated, given that some languages allow just one or the other.

1.1 Free Constituent Order

Russian is a familiar example of a language that permits relatively free constituent permutation, while generally prohibiting intercalation. Yimas, a Papuan language described by Foley (1986), is an even more consistent example of a free constituent order language, as order is apparently completely free within noun phrases and within clauses, though Foley provides no indication that the language tolerates constituent splitting. Due in part to the disambiguating function of the nominal agreement marker **-m**, each of the six possible permutations of the elements of the coordinate noun phrase in (1) are interpreted as grammatical paraphrases.²

- (1) a. payum ηaykum yuwa-m
 man-Pl woman-Pl good-Masc-Pl
 'Good men and women.' (167)
- b. ηaykum payum yuwa-m
 c. payum yuwa-m ηaykum
 d. ηaykum yuwa-m payum
 e. yuwa-m payum ηaykum
 f. yuwa-m ηaykum payum

Likewise, the unambiguous verbal agreement markers **-na** and **mpu** ensure the synonymy of the permutations in (2).

- (2) a. payum narman na-mpu-tay.
 man-Pl woman-Sg 3SgO-3PlS-see
 'The men saw the women.' (167)
- b. narman payum na-mpu-tay.
 c. payum na-mpu-tay narman.
 d. narman na-mpu-tay payum.
 e. na-mpu-tay payum narman.
 f. na-mpu-tay narman payum.

While it is possible to describe these ordering patterns by means of transformations, it is unclear what justifies assigning different constituent structures to such apparent syntactic free variants.

1.2 Constituent Intercalation

Next let us examine languages that illustrate varying degrees of word order freedom. Yidiñ, an Australian language spoken in North Queensland, provides a suitable point of departure, as it is reported to combine a relatively fixed constituent order with a restricted amount of constituent intercalation. Dixon (1977:268f.) identifies a number of ordering preferences that determine a norm SOV pattern, exemplified in the Yidiñ clauses in (3).³

- (3) a. wagujaŋgu guda:ga bunja:ñ.
 man-Er dog-Ab bit-Ps
 'The man hit the dog.' (256:332)
- b. ɲañji:ñ bamal guga:l mayi:gu.
 we-A person-Er call-Ps food-Prp
 'The people called us for food.' (260:361)

Dixon (1977:247ff.) reports as well that the constituents of noun phrases typically conform to a dominant order in which classifiers precede head nouns, which in turn precede adjectives, which precede quantifiers.⁴

These ordering tendencies appear to be operative even in clauses containing split noun phrases. In each of the examples that Dixon presents, some part of a discontinuous NP invariably occurs in the position that a contiguous constituent would normally occupy. As well, the subconstituents of a split NP typically preserve their norm relative order. This is illustrated by the examples in (4) and (5) below, which contain split absolutive arguments. The sentences in (4) each contain a generic noun or classifier occurring in the customary preverbal position, with the head (or qualifying) noun postposed.

- (4) a. ɲayu miña bugan gangu:l.
 1Sg-N animal-Ab eat-Pr wallaby-Ab
 'I am eating wallaby.' (270:403)
- b. ɲañji mayidi jula:l baŋga:mu.
 1Pl-N vegetable-Ab-Em dig-Ps potato-Ab (240:270)
 'We'd certainly been digging the potatoes.'

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(5) presents examples in which a deictic, possessive, and head noun, respectively precede the verb, while the remainder of the noun phrase occurs postverbally.

- (5) a. η ayu η u η u wawa:l munil.
 1Sg-N that-Ab see-Ps vine-Ab
 'I saw that Munil vine.' (270:404)
- b. η a η a η gi η a: η buga η gula.
 1Sg-A fever-Er eat-Pr body-Ab
 'The fever is eating my body away.' (257:343)
- c. η ayu bama wawa:ji η u jambu:l.
 1Sg-N person see-AP-Ps two-Ab
 'I (unexpectedly) saw two people.' (270:402)

Each of these examples can be straightforwardly generated from a base SOV order by means of a postposing operation that moves a subconstituent of a noun phrase to a postverbal position.⁵ The examples in (6) introduce additional complications for this simple movement analysis, as they deviate slightly from the pattern observed in (4) and (5). Thus, two elements occur postverbally in (6a), though not in the expected noun-quantifier order. This is also the one example of a split absolutive subject that Dixon discusses; however it is, perhaps significantly, the argument of a canonically unaccusative predicate. (6b) likewise contains the sole case of a split purposive cited by Dixon.⁶

- (6) a. bama gali η η abi gaja.
 person-Ab go-Pr many-Ab white man-Ab
 'Lots of white men are going.' (270:405)
- b. mi η a:gu yi η u gada η jaba:ngu.
 animal-Prp this-S come-Pr eel-Prp
 'This [person] is coming for eels.' (270:406)

Since such obliques normally follow the verb, the classifier would appear to have been preposed to initial position in (6b).

Notice that a movement analysis of the examples in (4)-(6), whether in terms of postposing alone, or in conjunction with a preposing rule, directly captures the generalization that some part of a split phrase invariably occurs in the position that the entire phrase would normally occupy. If, moreover, these operations

are formulated as rules that move a noun phrase to the periphery of the minimal clause in which it occurs, they will yield as output the split constructions above. Because each of the parts of a Yidiñ noun phrase can occur independently as an NP, any part will meet the target specifications of the rules stated informally above. This requires, however, that the movement rule responsible for splitting be allowed to apply to any element that is analyzable as a full NP, i.e., to any nominal bearing a case affix.

Since all elements of noun phrases are obligatorily marked for case in Yidiñ, it is impossible to test the predicted correlation between autonomy (whether a nominal element can stand on its own) and splitting. Nonetheless, an examination of comparable constructions in Diyari, a South Australian language, supports the postulated connection. In contrast to Yidiñ, each of the parts of a Diyari NP may occur with their nominal affix, or the entire constituent may share one phrase-final case marker. These options are illustrated by the sentences in (7): whereas both elements of the subject **kintala-li nunkani-yali** are marked for ergative case, the locative affix **-ni** attaches to the object **kana palpa** in (7b).⁷

(7) a. kintala-li nunkani-yali ηana mata-na wara-yi.
 dog-Er 3Sg-D-Er 1Sg-O bite-Part Aux-Pr
 'HIS DOG bit me.' (94:102)

b. ηani kana palpa-ni yata-na wara-yi.
 1Sg-S person some-Lc speak-Part Aux-Pr
 'I spoke to some of the people.' (57:32)

The sentence in (7b) clearly represents the unmarked construction, as Austin (1984:94) reports that (7a) conveys emphasis or contrast.

However, Austin also notes that while distributively case marked noun phrases like (7a) can be split apart as in (8), collectively marked NPs, like the locative in (7b), cannot.

(8) mankada-li ηana nayi-na wara-yi palpa-li.
 girls-Er 1Sg-O see-Part Aux-Pr some-Er
 'Some girls saw me.' (94:101)

Thus, precisely the class of nominal subconstituents that constitute NPs in their own right can occur within a

discontinuous noun phrase in Diyari.⁸ This restriction follows directly, if the rule that splits distributively marked NPs applies just to elements that are analyzable as full NPs.

1.3 Free Word Order

While movement rules of one form or another seem to represent an appropriate device for characterizing split constituent constructions in Yidiñ and Diyari, they provide a less satisfactory description of the considerably freer word order patterns that occur in Latin poetry and prose.⁹ The plausibility of a movement analysis of the word order conventions of a language depends on the existence of some reasonably natural class of target elements and a fixed inventory of dislocated positions to which they are moved. Otherwise, a movement analysis enjoys no advantage in economy or explanatory adequacy over an account that independently generates a set of alternative orders. Although determining the viability of this approach for Latin is clearly beyond the scope of this paper, a relatively straightforward demonstration of the inadequacy of a movement analysis can be constructed on the basis of the extraordinary word order freedom reported for Pama-Nyungan languages such as Dyirbal and Warlpiri.

Although Dixon (1972:291) lists a number of tendencies that determine a dominant OSV order in Dyirbal, he reports that deviations from this ostensible norm are relatively common. Thus, alongside (9a), whose contiguous nominal arguments conform to an OSV pattern, he presents the radically scrambled (9b).

- (9) a. bayi waŋal baŋul yaraŋu bulganu
 that-Ab1 boomerang-Ab that-G man-G big-G
- baŋgun jugumbiru buran.
 that-Er2 woman-Er see-Nf (107:320)
- b. bayi yaraŋu jugumbiru buran waŋal
 that-Ab1 man-G woman-Er see-Nf boomerang-Ab
- baŋgun baŋul bulganu.
 that-Er2 that-G2 big-G (107:321)
 'Woman saw big man's boomerang.'

Notice that the ergative **baŋgun jugumbiru** and absolutive **bayi waŋal baŋul yaraŋu bulganu** are thoroughly intercalated rather than nested in (9b). Moreover, the head noun **yaraŋu** of the genitive is scrambled out of both the embedded genitive and absolutive argument.

While the order of the elements of subordinate and coordinate clauses is similarly free, Dixon (1972:76) reports that scrambling across clauses is generally prohibited. Representative examples of subordinate and coordinate constructions are given in (10).

- (10) a. bayi yara walmaŋu wayñjili.
 that-Ab1 man-Ab got up-Nf went uphill-Prp
 'Man got up (in order) to go uphill.' (68:75)
- b. bayi yara walmaŋu wayñjin.
 that-Ab1 man-Ab got up-Nf went uphill-Nf
 'Man got up and (then) went uphill.' (67:74)

Unlike tensed coordinate clauses, subordinate clauses like (10a) with purposive inflection can be recursively embedded. The feature of these constructions that is relevant in the present context is the fixed ordering patterns they exhibit. Dixon (1972:76) reports that subordinate clauses must occur in their iterative order, although relative order within them is free. The one apparent exception to this involves purposive verbs, which may sometimes precede the tensed verb of a main clause. This is illustrated in (11).

- (11) bayi yara biligu jingaliŋu.
 that-Ab1 man-Ab climb-Prp run-Nf
 'Man runs [to the tree] to climb [it].' (291:680)

Notice, however, that this sentence does not involve scrambling of a tensed and subordinate clause so much as free ordering of a main verb and its complement.

2 Generating Free Orders

If Dixon's description of Dyirbal word order is basically accurate, Dyirbal represents a clear example of a language in which word order alternations are not revealingly captured by means of grammatical transformations. As Chomsky (1965) acknowledges,

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languages with the degree of word order freedom attributed to Dyirbal provide the strongest sort of empirical evidence for a model of grammar that relates the alternative orderings of a sentence by some mechanism other than transformations.

Suppose that for some language each permutation of the words of each sentence were to give a grammatical sentence that, in fact, is a paraphrase of the original. In this case, the set-system [of Curry (1961) JB] would be much superior for the categorial component of the grammar of this language. No grammatical transformations would be needed, and the rule for realizing underlying abstract representatons would be extremely simple. But there is no known language that remotely resembles this description. (1965:126)

Before suggesting a means of describing free word order on the scale tolerated by Dyirbal, I will briefly consider some previous analyses of free word order phenomena. I will not attempt to give an exhaustive summary of the numerous proposals that have been suggested, but will instead briefly outline representatives of various dominant strategies.

The W^* grammars proposed by Hale (1981), and developed in greater detail by Nash (1986), provide one means of directly generating the sentences of a language such as Warlpiri that exhibits extremely free word order. These degenerate grammars consist essentially of a single phrase structure rule like (12), which rewrites a unique terminal by a string of terminals.

(12) $E \rightarrow W^*$

Hale's proposal is problematic in a number of familiar respects. Along with bifurcating the grammars of natural languages into formally distinct subclasses: the so-called X-bar and W^* grammars, this analysis does not have any natural means of distinguishing free word order from free constituent order languages, which seem to straddle the X-bar/ W^* boundary.

Another common strategy involves postulating a set of base rules that generate an articulated representation, and then introducing supplementary devices, like the

scrambling transformation of Ross (1967) or the liberation metarules of Pullum (1982) or Uszkoreit (1987), to mediate between the base rules (or the structures they generate) and a set of derived rules or structures.

(13) Scrambling Transformation

X	α	β	Y	OPTIONAL
1	2	3	4	=>
1	3	2	4	

where: α, β range over {N, NP, V, VP, Adj, Adv},
and any S_i dominates 2 iff S_i dominates 3.

(14) Generalized Liberation Metarule

α	->	Φ, β		=>	α	->	Φ, Ω
β	->	Ω					

where: α, β range over single symbols and Φ, Ω
range over strings of symbols.

However, these sorts of devices are notoriously difficult to constrain and correspondingly difficult to accommodate within either the transformation or metarule paradigm. Thus, unlike movement transformations, which typically apply only to constituents and operate over an unbounded domain, the scrambling rules required for languages like Latin or Dyirbal must be permitted to apply to arbitrary parts of a phrase, while the domain of their application must be bounded at least by indicative clauses. Moreover, as Lapointe (1981) notes, such rules lead to widespread derivational ambiguity, as any sentence potentially has infinitely many derivations in which scrambling rules permute elements back and forth.

Liberation rules of the sort in (14), which have the effect of collapsing a pair of immediate dominance rules, present analogous problems as they introduce spurious structural ambiguity in the case of sentences like (9a), which can be derived either with or without such a metarule. Further, such rules can freely generate random, and as far as I am aware, unattested patterns, such as free order just between adpositions and their arguments, or a combination of free order within noun phrases with fixed constituent order within clauses. As well, neither scrambling nor liberation rules provide any

direct means of characterizing the difference between free word order and free constituent order. Lastly, by bifurcating the class of natural languages into those with fixed and those with variable constituent structure, both of these proposals essentially concede that constituent structure may vary without limit within and across languages.

2.1 Generating Discontinuous Constituents

Next, I will present an alternative means of describing free word order phenomena that confines the required variation to the principles that determine constituent order, rather than those that determine constituent structure. This proposal accordingly assumes a model of grammar; specifically the ID/LP format of GPSG, in which the rules that introduce hierarchical structure are explicitly dissociated from the rules that impose ordering restrictions. Representative immediate domination and linear precedence rules are given in (15); together, these rules generate essentially the same structures as the familiar phrase structure rule in (16).

- (15) a. $S \rightarrow NP, VP$ (S immediately dominates NP and VP)
 b. $NP < VP$ (NP must precede a sibling VP)

- (16) $S \rightarrow NP VP$

Due to this separation of order and structure, ID/LP grammars can straightforwardly allow free permutation of sibling nodes simply by omitting LP statements that order them. Yet, because LP rules order only siblings, free permutation of nonsiblings cannot be licensed by the absence of applicable LP statements.

Liberation rules provide one means of extending the descriptive range of ID/LP grammars, since by pruning nonterminals they make terminal nodes siblings in a flattened derived structure. However, the alternative I will pursue here involves instead relaxing the strict locality constraints on LP statements, and allowing such statements to order (or fail to order) phrase-mates; i.e. the arguments and modifiers of a lexical head. This revision, in conjunction with the standard GPSG analysis of sentences as endocentric verbal projections, provides a direct means of describing the free constituent

ordering patterns exhibited by Russian and Yimas. For example, each of the sentences in (2) will be generated by a grammar like (17) containing only ID rules.

- (17) S -> NP, VP
 VP -> V, NP
 NP -> payum
 NP -> narmaŋ
 V -> na-mpu-tay

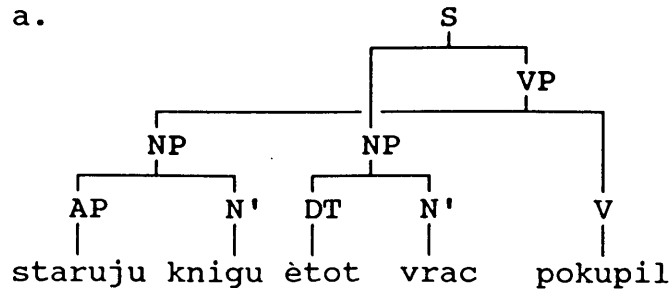
As a means of distinguishing free word order from free constituent order languages, I propose that we reconsider the relation induced by the precedence predicate in the revised LP statements. First of all, following essentially Wall (1972) let us identify the precedence relation as a strict (i.e. transitive, asymmetric, irreflexive) partial order on the nodes of a tree. Moreover, let us adopt the convention proposed by McCawley (1982:93), according to which "nonterminal nodes stand in a [precedence] ordering relationship if and only if their descendants [i.e. the nodes they dominate] stand in the same relationship." Next, consider whether the precedence relation is connex within a phrase; i.e., whether any pair of phrase-mates must stand in some precedence relation. If we impose this condition, intercalation of phrase-mates will be prohibited, as intercalated constituents will not stand in any determinate precedence relation. If we fail to impose such a condition, intercalation will be freely permitted.

That is, the connex/nonconnex distinction corresponds directly to the difference between free constituent and free word order. Accordingly, allowing connexity to vary across languages provides a means of characterizing the distinction between Russian and Dyirbal. For example, consider the sentences in (18), and the associated structural analyses in (19).

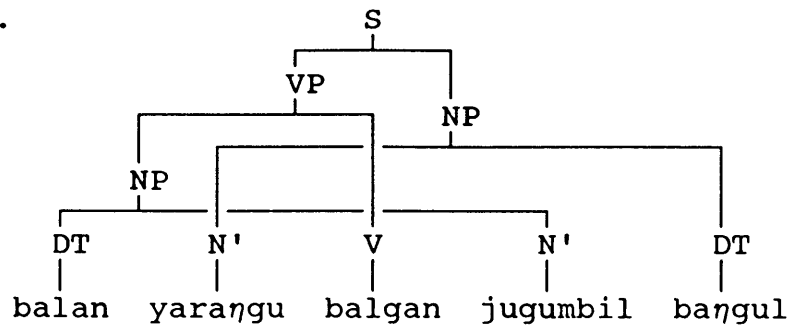
- (18) a. Staruju knigu ètot vrac pokupil.
 old-A book-A this-N doctor-N bought
 'This doctor bought the old book.'
- b. balan yaraŋgu balgan jugumbil baŋgul.
 that-Ab2 man-Er hit-Nf woman-Ab that-Er1
 'man hit woman.' (cf. 68:79)

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(19) a.



b.



Whereas the verb, subject and object stand in a precedence relation in (19a), this is not true in the scrambled (19b).

Introducing something like the connexity parameter in (20) thus induces a less radical typological division of languages, according to the operative conditions on their precedence orderings, rather than on the basis of the constituent structures that they assign.

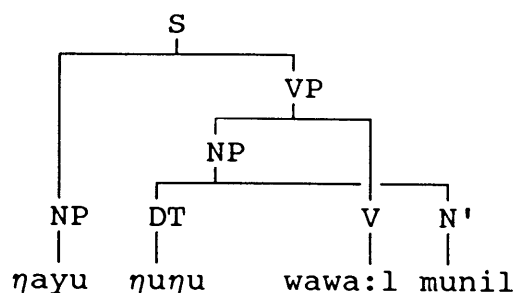
(20) The Connexity Parameter: grammars may differ with respect to whether the base precedence ordering they impose is connex or nonconnex (at the level of phrase-mates).

Further, a consideration of Yidiñ and Diyari provides evidence that connexity or nonconnexity is best thought of as characterizing base structures. For present purposes it is immaterial whether these are construed as the output of a classical categorial component, or as wellformed structures generated without the involvement of metarules, rules of functional composition, or whatever devices sanction dislocation constructions within a particular model of grammar. All that is required is that a grammar have some means of distinguishing basic sentences from those whose

derivation involves rules that generate extraction structures.

Recall that the word order patterns of Yidiñ and Diyari, unlike those in Yimas and Dyirbal, were argued to be derivable from a base SOV order by movement rules that shifted an element to a clause-peripheral position. If as suggested above, this movement is captured by means of reordering rules that alter constituent order without any concomitant effect on constituent structure, a sentence like (5a) will be associated with the discontinuous structure in (21).

(21)



Thus, Yidiñ is not connex, as ηuηu munil does not stand in any precedence relation to the verb wawa:l. However, Yidiñ word order is nevertheless subject to various constraints noted above that are incompatible with its being nonconnex. What this suggests is that connexity or nonconnexity must hold of the precedence orderings of basic structures of a grammar, and not of the derivative extraction constructions. On this interpretation of (20), Yidiñ is connex, as clauses conforming to its basic continuous SOV order are connex. Moreover, on the assumption that the grammars of Dyirbal and Yimas do not contain movement rules, these languages are unaffected by this refinement of the connexity parameter.

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Notes

1. I am grateful to Emmon Bach, Roger Higgins, Geoff Huck, Rex Wallace and Edwin Williams for helpful comments on earlier drafts. This work was supported in part by the Social Sciences and Humanities Research Council of Canada.

2. After each of the Yimas, Yidiñ, Diyari and Dyirbal examples, the page and (where applicable) corresponding example number from the identified source are given in parentheses. The orthography in the Yidiñ and Dyirbal examples follows Dixon (1972), with the following substitutions: ñ for n; j for d; and r for r.

3. The operative preferences that Dixon suggests can be briefly summarized as follows. Ergative, absolutive and instrumental noun phrases, as well as all varieties of pronominals, canonically occur preverbally. Further, pronouns tend to precede nonpronominal NPs, while among the full noun phrases, ergatives usually precede absolutives, which typically precede instrumentals. Datives, purposives and other obliques usually follow the verb, except when they are pronouns.

4. This is again something of a simplification, and ignores the characteristic patterns of pronouns, which usually occur initially, inalienably possessed NPs, which follow the head noun, and deictics, whose order is apparently free.

5. Whether this operation affects hierarchical structure or just linear order is a question that I will not prejudge here: for a characterization of structure-preserving reordering rules see McCawley (1982), Blevins (forthcoming).

6. Split ergatives, and multiple split NPs are conspicuously absent from Dixon's corpus; Dixon (1977:270) notes that the former "MAY be possible, but informants were not too happy with them" (emphasis in original).

7. The dative case affix in (7a) marks possession and plays no role in sanctioning the double ergative marking.

8. Similar facts are reported for Warlpiri by Hale (1981) and Nash (1986).

9. As described by Barnett (1983), among others.

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