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MOVEMENT AND ADJUNCT MORPHOLOGY IN
ARAWAK AND OTHER LANGUAGES

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In this paper, we are concerned with the description and explanation of an interesting asymmetry in the distribution of "dummy verbs" in WH-Movement constructions in Arawak, an Arawakan language spoken by about 700 speakers in Surinam and probably a larger number in Guyana.¹ The facts are, briefly, that the dummy verb obligatorily occurs when certain constituents are fronted (e.g., the verb or certain adjuncts, such as manner phrases) but cannot occur when others are fronted (e.g., subjects, objects, and certain kinds of adjuncts, including temporal and locative adverbs). We argue that this asymmetry finds a straightforward explanation in the form of the ECP, as reformulated in terms of L-Marking in Chomsky (1986). We also compare the phenomenon in question with apparently similar phenomena in two other languages—Vata (as reported by Koopman 1984 and Koopman and Sportiche 1986) and Yoruba (as reported by Carstens 1985; 1986 and Sonaiya 1986). In these languages, too, the fronting of certain constituents is obligatorily accompanied by the introduction of special morphology. The distribution of what we may call Adjunct Morphology, following Koopman, is comparable in the three languages, but there are differences among them which have an important bearing on the analysis of the phenomenon. Finally, we claim that the facts of Arawak argue against the Generalized Binding analysis advanced in Aoun et al. (1987) to account for the cross-linguistic difference in extractability between *when*-type adjuncts and *how*-type adjuncts.

Arawak is an SVO language with fairly fixed constituent order, as illustrated in:

- (1) *to hiaro kanaby-fa to kodibio-be*
the woman hear-Fut the bird-Pl

¹ For a detailed discussion of the phonology, morphology, and syntax of Arawak, see Pet (1987). The phonology is also discussed in Pet (1979) and Taylor (1969). We employ here the orthography currently used by Arawaks in writing their own language. In this orthography, *y*=/i/, *j*=/j/, *th*=/t^h/, *kh*=/k^h/, *lh*=/ʎ/ (a retroflexed apical flap), *r*=/r/ (an apical tap or trill), *f*=(Φ) (a voiceless bilabial fricative). Word stress is typically on the first syllable of the stem. However, this word stress rule interacts in a complex way with a pause-group stress rule. See Pet (1979) for discussion.

It exhibits clause-bounded WH-Movement; question phrases, focused constituents, and relative pronouns appear on the left periphery of the clause containing the associated gap. (2) illustrates question movement of the subject (2a), the direct object (2b), a manner phrase adjunct (2c), and a time phrase (2d). (3) gives examples of focus movement of the direct object (3a), a time phrase adjunct (3b), and the verb (3c).²

(2a) SUBJECT: *Alikan_i [t_i] andy-fa?*
 Who come-Fut
 = 'Who will come?'

(2b) DIRECT OBJECT: *Alikan_i by-dykha [t_i]*
 Who you-see
 = 'Who do you see?'

(2c) MANNER: *Halika_i b-o-fa doro-n to*
 How you-AUX-Fut weave-Inf the
joro [t_i]
 cassava-squeezer
 = 'How do you weave the cassava squeezer?'

(2d) LOCATION: *Alon by-dykha to kodibio*
 Where you-see the bird

(3a) DIRECT OBJECT: *Aba bahy_i da-malhita [t_i]*
 One house I-made
 = 'It is a house that I made'

(3b) TIME: *Miaka aba wadili sika khali da-myn*
 Yesterday a man gave cassava-bread me-to

(3c) VERB: *M-osy-n_i b-a [t_i] forto-nro*
 Neg-go-Inf you-AUX town-to
 = 'It's not go-to-town that you do'

The fronted constituent occurs immediately before the subject, as shown in (3b) (there is no subject-inversion associated with fronting), and no more than a single constituent may appear in the presubject position. Thus, for example, (4), in which both the direct object and a time adverb have been fronted, is ill-formed (regardless of the order of the fronted constituents).³

² This is usual only with negative verbs.

³ This sentence becomes grammatical with a pause between *mothi* and the remainder of the sentence. It is argued in Pet (1987) that, in this case, *mothi* occupies a Topic position under S', and that only *tho-jona* is in COMP.

- (4) **mothi tho-jona d-othiki-fa*
 tomorrow its price I-receive-Fut
 = ('Tomorrow I will be paid for it')

We identify the landing site for this movement as COMP (more precisely, the Specifier position of the COMP projection [Spec C]—see below).⁴

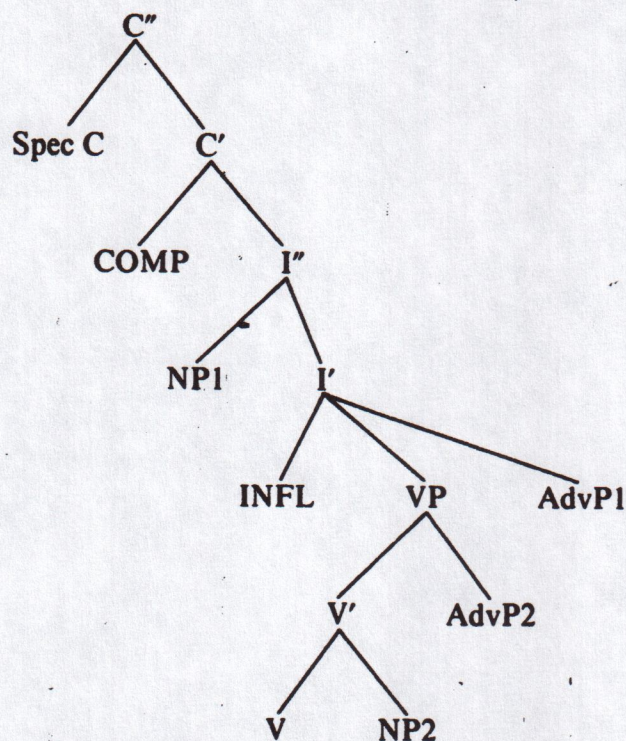
As (2) and (3) show, some instances of questioning/focusing involve simple fronting of the affected phrase, while in others fronting is accompanied by insertion of the semantically empty verb *a*, glossed here as AUX, to which the subject clitic and tense/aspect particles are attached. The lexical verb in such cases assumes an infinitive form. (Due to morphophonemic processes, *a* sometimes appears as *o*.) Questioning or focusing of subjects, complements, and adverbial phrases of time or location does not involve *a*-insertion, while *a* is inserted obligatorily in the case of preposing of manner phrases or direct quotations. Thus, (2c) cannot be expressed as (2c'), for example:

⁴ The position in question lacks some of the properties associated with the COMP position in English. First, it is not on the same periphery of the clause as lexical complementizers; markers of subordination in Arawak, which in the absence of evidence to the contrary we assume to be structurally analogous to complementizer elements like *that* in English (i.e., heads of the C[omplementizer] projection), occur affixed to the right of the embedded verb. Second, it is not the locus of intermediate traces in successive cyclic, "COMP-to-COMP" movement, which does not occur in Arawak. These considerations led Pet (1987) to conclude that WH-movement in Arawak is not movement to COMP but rather Chomsky-adjunction to S. This assumption, it was claimed, would first of all explain how leftward WH-movement could exist in a language with rightward complementizers. Second, it could explain the absence of successive cyclic movement, if taken in conjunction with the claim of Koopman (1984:180ff.) that antecedent-government requires COMP indexing. Koopman proposes that only heads may govern, and in order to antecedent-govern its trace a moved phrase must project its index onto a head—COMP, in the present case. (See also n. 16.) In a language where WH-movement is not to COMP, but to an adjunction site, the intermediate trace in successive cyclic movement could not be antecedent-governed by the extracted WH-phrase, under this assumption, and successive cyclic movement would accordingly be predicted to be impossible. Neither fact actually requires such a conclusion, however, given current assumptions. First of all, under the analysis of the structure of COMP presented in Chomsky (1986) (unlike earlier analyses) the landing site for WH-movement and the lexical complementizer position are no longer under a single COMP node; the latter is the head position (C⁰) of the COMP projection, while the former is the Specifier position of that projection (see the tree in 5). There is therefore no reason to expect that they should necessarily be on the same side of the clause. Second, there are other ways of ruling out successive cyclic movement in Arawak. For example, we could assume simply that both S and S' are bounding nodes for subjacency. Moreover, if we do accept that antecedent-government is dependent on COMP-indexing, then it appears that we must conclude that WH-movement in Arawak is to a landing site in COMP, since, as we argue below, subject traces in Arawak are antecedent-governed. This is the position that is adopted in the present paper.

(2c') **Halika bo-doro-fa to joro?*

Similarly, focusing of the verb, as in (2b), requires *a*. We argue that this distribution can be derived from the ECP, as reformulated in Chomsky (1986) in terms of L-marking. For expository purposes, we develop our argument by reference to the tree in (5) (order irrelevant).⁵

(5)



Consider first the position of NP1. Since subjects can be moved in Arawak, leaving traces, the subject position must be properly governed in some way, in order to ensure satisfaction of the Empty Category Principle (ECP).⁶ Evidence that the subject is moved in such cases as

⁵ For readers unfamiliar with this type of phrase-structural representation, we note that sentences (S, in earlier notation) are held to be headed by an I(NFL) node, whose lexical instantiations in English, for example, include modals and tense auxiliaries. They are therefore projections of INFL, hence INFL phrases (IPs). The subject position is taken to be the specifier of the INFL projection. The S-bar of earlier versions of the theory is held to be a projection of a C(OMP) position, whose lexical instantiations in English, for example, include complementizers like *if* and *that*. The specifier position of the COMP projection is held to be the landing site for WH-movement. For details see Chomsky (1986) (especially pp. 2ff.) and the references cited there.

⁶ The ECP, in its standard formulation, requires traces left by movement to be properly governed—i.e., either governed by a lexical X⁰, as in the case of traces in complement positions, or by a c-commanding local antecedent, as in the case of subject extractions like:

(i) *I wonder [who_i [_{IP} t_i saw him]]*

(2a), at least at some level, rather than being left in situ, is provided by the fact that other constituents cannot be fronted in sentences with subject question phrases. This follows, given obligatory movement of subject questions, from the one-fronting-per-clause restriction noted above.

If we assume the standard disjunctive formulation of proper government, there are, a priori, two ways in which this requirement might be met. The subject position is either antecedent-governed by the moved phrase in Spec C or lexically governed by INFL, assuming that INFL is a possible proper governor for subject positions. We have some reasons for provisionally rejecting the latter assumption, however, at least for Arawak. First, in the framework of *Barriers*, on which the present analysis is based, INFL cannot be a lexical governor for the subject in general, since lexical government requires a head-complement relationship.⁷ We should note that this exclusion of lexical government of subjects by INFL is explicitly rejected by Chung and McCloskey (1987:198n.). However, even if it does not hold, and if INFL is a proper governor for subjects in "pro-drop" languages, as suggested by Chung and McCloskey (1987:217), Arawak does not qualify, since it does not allow pro-drop at least in the relevant constructions.⁸ Thus, the trace in the subject position in (2a), we conclude, is antecedent-governed from Spec C. Further support of this conclusion is introduced below. Similar considerations indicate that a trace of a sentential adjunct, such as

⁷ Later in *Barriers*, Chomsky (1986:78ff.) speculates about the possibility that all proper government reduces to antecedent-government, with θ -government playing no role. We reject this possibility since it does not provide a basis for accounting for the asymmetry between adjunct extraction and object extraction from Arawak VPs, to be discussed below.

⁸ We assume that such sentences as (i) have overt subjects, in the form of the clitic glossed as a pronoun, and that these sentences are therefore not pro-drop sentences.

(i) *Ly-jentoa san li-sikoa lokhodi*
he-sing well his house in

We reject an alternative analysis, under which such forms are not subjects themselves but only agreement markers, cooccurring with (and licensing) null subjects. They do not occur when the sentence contains another overt subject, as in (1) above, or when subject position is occupied by a trace, as in (2a). This complementarity falls out from the assumption that, e.g., *ly* in (i) is a subject pronoun, but will require stipulation if it is taken to be an agreement marker.

However, suppose we adopt the alternative analysis, taking *ly* and similar forms to be part of INFL (either clitics or agreement markers), whose presence makes INFL sufficiently "rich" to license (obligatory) pro-drop, and assuming with McCloskey and Chung that an INFL properly governs the subject position just in case it can license pro in that position. It will still be the case that the trace in (2a) is not properly governed by INFL, under these assumptions, since clitics are obligatorily absent in the case of subject fronting.

AdvP1, is at least licensed by antecedent-government from COMP. In the *Barriers* framework, antecedent-government would be possible in these cases since S (=IP) is not a barrier for government except by inheritance. (See Chomsky 1986:14–15 for discussion.)

There are both semantic and structural grounds for maintaining that nonsubcategorized time and location phrases in Arawak are attached at a higher level than manner adverbials. Semantically, it is clear that time and location phrases are less closely associated with the verb than are manner phrases; the former establish a general temporal or spatial framework for the proposition as a whole, while the latter modify specifically the action described by the verb (cf. Ernst 1983). Syntactic support for this conclusion is provided in Arawak by the fact that manner adverbs obligatorily occur closer to the verb than time or location phrases, as illustrated, for example, by the sentences in:

(6a) *Ly-jentoa san li-sikoa lokhodi*
he-sang well his-house in

(6b) **Ly-jentoa li-sikoa lokhodi san*
he-sang his-house in well

Thus, we conclude tentatively that manner adverbials are contained in VP, while time and location phrases are daughters of some projection in INFL—either I' or I".⁹ The semantic dependencies existing between the tense features of INFL and time adverbials, moreover, as well as other considerations to be mentioned below, suggest that at least some 'sentence-level' adverbials might best be considered complements (that is, sisters) of INFL⁰, so we assume provisionally that temporal and locative phrases occupy the position of ADVP1 in (5). This assumption is not crucial for our analysis of Arawak, but will become important when we look at other languages below. Given these assumptions, the following pattern emerges in examples (2) and (3): Those elements which may be fronted without *a*-insertion (NP1, NP2, AdvP1) are all properly governed in one way or another: NP2 is lexically governed (θ -governed)

⁹ Other proposals about the positions of adverbials have been made, though these are possibly harder to reconcile with X-bar theory. Huang (1983) and Koopman and Sportiche (1986) consider VP adverbs to be sisters of VP, i.e., to occur in the underlined position in:

(i) [_{VP} AdvP [_{VP}]].

Aoun et al. (1987), following a proposal of Andrews (1982), claim that ALL adverbials are in VP: "sentential" adverbs are sisters of VP, while "VP" adverbs are attached at a lower level within VP. Note that the predictions about antecedent-government from COMP of "sentential" adverbs would remain unaffected under the latter analysis; the adverbial in a configuration like [_{VP} AdvP [_{VP}]] would not count as dominated by VP in the sense of *Barriers* (1986:7), since it is not dominated by every segment of VP. (See n. 10.)

by V. NP1 and AdvP1 are (at least) antecedent-governed from COMP. On the other hand, those elements whose fronting requires *a*-insertion (V, AdvP2) are first of all not complements of any X^0 . (For an argument that even though INFL may θ -mark VP in the sense of *Barriers* it does not properly govern the V which heads VP, see Chomsky 1986:71.) That is, the positions occupied by these elements are not lexically governed. Nor, in the absence of the dummy auxiliary *a*, are they antecedent-governed from COMP, since VP and by inheritance IP in (5) are barriers to such antecedent-government. We assume that Arawak observes the "inclusion" or "domination" version of government, so that the positions in question cannot come to be antecedent-governed by way of the intermediate step of adjunction to VP.¹⁰ (V is prohibited from adjoining to VP in any case by plausible general restrictions on adjunction.) Thus, extraction from such positions should result in ECP violations.

We claim, however, that such extractions are made compatible with the ECP by insertion of *a* in INFL; *a*-insertion results in the lexicalization of INFL. Since INFL already θ -governs VP, a lexical INFL will L-mark VP,¹¹ in consequence of which VP will cease to constitute a barrier (and a blocking category) for the positions in question. Since VP is not a blocking category, IP will not inherit barrierhood from VP.¹² The traces in (1*b*) and (2*b*), contained in a VP so L-marked, are

¹⁰ The "inclusion" and "exclusion" versions of government (cf. Chomsky 1986:9 and 81) differ with respect to whether α can govern β in an adjunction structure like (i), where γ is a barrier with respect to β :

(i) ... δ ... [γ ... α ... [γ ... β ...]]

Under the exclusion formulation it can, since α is not excluded by γ , because there is a segment of γ (the adjunction node) that dominates it. α in turn can be governed by δ since α is not dominated by γ because it is not dominated by every segment of γ . It is therefore possible to move from β to δ through the adjunction position α with antecedent-government licensing each trace. Under the domination (inclusion) version of government, on the other hand, α does not govern β since there is a barrier γ that includes β but not α .

¹¹ The concept of L-Marking undergoes successive revisions throughout Chomsky (1986). For expository convenience, we assume the definition given on page 15. Subsequent modifications seem to be of no consequence in the context of the present discussion:

(i) [C28] α L-marks β iff α is a lexical category that θ -governs β .

That is, α must assign β a semantic (θ -) role under government.

¹² The following definitions are assumed:

(i) [C25] γ is a Blocking Category for β iff γ is not L-marked and γ dominates β

(ii) [C26] γ is a barrier for β iff (a) or (b):

a. γ immediately dominates δ , δ a blocking category for β ;
b. γ is a Blocking Category for β , $\gamma \neq IP$.

therefore antecedent-governed by their clause-initial antecedents because no barriers intervene. Following a suggestion in Koopman and Sportiche (1986), we assume that the inadmissibility of the dummy verb in cases where it is not required for the purpose of L-Marking the VP is due to a general tendency for languages to disallow licensing strategies except where they are necessary to avoid violation of a principle of grammar.

There is one apparent exception to our claim that the dummy verb *a* does not occur in instances of fronting of complement phrases. As example (7) shows, when direct quotation phrases occurring as apparent complements of verbs of speaking undergo focus fronting, *a* must occur. Again, it does not occur in these cases in the absence of fronting, as illustrated by (7*b*). (Example 7*c* illustrates a common type of ellipsis, in which the lexical verb in such constructions is omitted.)

- (7*a*) "Hehe!" *l-a onaba-n*
 "Yes!" he-Aux answer-Subord
- (7*b*) **l-a onaba-n "Hehe!"*
 he-Aux answer-Subord "Yes!"
- (7*c*) "W-osa-the" *d-a tho-myn*
 We-go-back I-Aux her-to
 "Let's go back," I [said] to her'.

There are reasons for believing, however, that the fronted phrases in such cases are in fact not complements, but a variety of adjunct. First, we note that the verbs with which they occur—*dian* 'to say/talk', *onaban* 'to answer', and *simakan* 'to scream', among others—function elsewhere as simple intransitives, as in (8), for instance.

- (8) *Ly-dia-bo*
 he-speak-Cont

Second, sentential direct quotations do not occur with the subordination marker *-n* which is attached to the verb in a normal sentential complement. Compare (7*c*) with (9).

- (9) *na-dykha to firobero dalhidi -n -bo konoko-nro*
 they see one tapir run SUBORD Cont jungle-toward
 = 'They saw the tapir running toward the forest'

Finally, we note that, in addition to being an appropriate answer to a *what* question, (7*c*) is also an appropriate answer to the question in (10),

Given these definitions, Ss (IPs) are never barriers intrinsically and can come to constitute barriers only by "inheritance" from Blocking Categories which they dominate, for positions occurring in those Blocking Categories. See Chomsky (1986) for discussion.

in which the interrogative form is *how*—typically, an adjunct interrogative. This may be construed as further evidence that direct quotations do not have the status of complements.

- (10) *Halika b-a dia-n tho-myn*
How you-Aux speak-Subord her-to

We conclude, therefore, that (7a) does not counterexemplify our claim that *a* occurs only in the case of fronting of (certain types of) adjuncts.

Arawak is not the only language which exhibits special morphology just in the case of adjunct fronting. Two other cases have received extensive consideration in the literature. In Yoruba, as described in Carstens (1985; 1986) and Sonaiya (1986), the relevant facts about fronting in simple sentences are as follows: as in Arawak, complements of the verb can be fronted with no special morphology, as in (11a). Fronting of certain adjunct phrases, however, as was the case in Arawak, requires the presence of one of a small number of auxiliaries (labeled preverbs by Sonaiya). This is illustrated in (11b) and (11c), where the auxiliary is underlined.

- (11a) [*Ki_i ni*] *o ri* [*t_i*]
what Foc you see
'What did you see?' (Carstens 1986)
- (11b) [*Nibo_i ni*] *Tolu ti ri Ajike* [*t_i*]
Where Foc Tolu Aux see Ajike
'Where did Tolu see Ajike?' (Carstens 1986)
- (11c) [*Bawo ni*] *o ti se fe lo* [*t_i*]
How Foc you Aux Aux want go
'How do you want to go?'¹³ (Sonaiya 1986)

Yoruba differs from Arawak in two relevant respects. First, unlike Arawak, extraction from subject position is not permitted to leave an empty element behind. Instead, as (11d) shows, an overt resumptive pronoun is required in subject position. This suggests that Yoruba lacks antecedent-government from COMP, so that the subject trace must be "spelled out" in order to avoid an ECP violation.¹⁴ The investigators cited attribute this to the fact that the obligatory presence of the focus

¹³ As this example indicates, more than one of these preverbs can cooccur. See Sonaiya (1986) for discussion.

¹⁴ For an argument that this is true even in cases in which the resumptive pronoun has no realization in the segmental phonology, see Sonaiya (1986).

particle *ni* in COMP yields a branching COMP, from which the proposed constituent cannot c-command, hence govern, its trace.¹⁵

(11d) [Ta ni] ó wa
Who Foc 3Sg came

Given this absence of antecedent-government in Yoruba, it is apparent that our characterization of the role of the dummy verb in Arawak—as removing a potential barrier by L-Marking it so that the trace will come to be governed by its antecedent—cannot be extended directly to constructions like (11b). It could be argued, however, that, in addition to L-Marking the VP and thereby preventing it from being a barrier to government, the preverb in sentences like (11c) also serves as a (lexical) proper governor for the adjunct. This is, essentially, the analysis of Carstens and Sonaiya. This of course requires appropriate modification of the definition of lexical government. If the preverb is to govern “down into” the VP in the manner proposed, then lexical government cannot be restricted to complements of X^0 heads, as proposed above. Rather, we will have to assume that an X^0 can lexically govern an element Y which is not its complement, so long as it c-commands Y (in the sense of Chomsky 1986:8), and X^0 and Y are separated neither by barriers nor by the domain of closer governors of Y. It is important to note that the presence of a preverb, while licensing adjunct traces, does not serve to license a subject trace in Yoruba; the only strategy available for subject extractions is the resumptive pronoun strategy. This serves to support the position we assumed above in our discussion of Arawak that INFL is not a potential proper governor for the subject position (apparently, whether INFL is lexical or not). We can derive this result from the fact that, in a tree like (5), the subject position is not dominated by the lowest projection of X, and is thus not c-commanded by it in the sense assumed here.

The second relevant difference between Arawak and Yoruba has to do with the classes of adjuncts for which the dummy verb strategy is required. In Arawak, as we noted, it is required for manner adverb phrases, but not for time or location phrases. In Yoruba, manner phrase frontings, as in (11c), AND location phrase frontings, as in (11b), require the dummy verb, as do cause/purpose questions. According to Sonaiya,

¹⁵ This proposal can probably not be transferred directly to the framework of Chomsky (1986), where, presumably, the two bracketed elements in (11d) would occupy different positions in the structure represented in (5)—WH in Spec C and *ni* in C^0 . See Stowell (1987) for a possible way of accounting for such “that-t” type effects under the assumption of a tree like (5).

Yoruba agrees with Arawak in not requiring it with temporal adverbs. Consider:

- (11e) *Nigbawo ni o ri Tolu?*
When Foc 2Sg see Tolu?

'When (= at-time-which) did you see Tolu?' (Sonaiya, personal communication)

We shall return to a discussion of this partitioning of adverb phrases below.

A third case of special morphology in adjunct preposings is found in Vata, as discussed in Koopman and Sportiche (1986). The realization of this morphology is substantially different in Vata than in Arawak or Yoruba. In the remaining discussion, we adopt Koopman's and Sportiche's label Adjunct Morphology to refer generally to the phenomenon in all three languages. The relevant facts about Vata are represented in (12). As (12a) shows, resumptive pronouns are required in subject questions in Vata, again suggesting the absence of antecedent-government. Koopman (1984) proposes that this is due to the fact that WH-movement in Vata involves adjunction, rather than movement to COMP, precluding the possibility of COMP indexing.¹⁶ In (12b) we see that objects may be questioned with no special morphology and no resumptive pronoun. (12c) shows that a resumptive form is required when the verb is fronted (in this case, by focus movement). (12d) shows that, when a manner adverbial is fronted, the verb must be assigned a special affix, glossed here as M, and reduplicated. (With reason and cause adverbials, the verb receives a special affix, but is not reduplicated.) Thus, it appears that this marking is analogous to the dummy auxiliaries in Arawak and Yoruba in licensing adjunct fronting.¹⁷

- (12a) *àl Q/(*[t]) nU ml la*
who he did it WH

'Who did it?' (Koopman and Sportiche 1986)

- (12b) *yī kòfi nU[t] la*
what Kofi did WH

'What did Kofi do?' (Koopman and Sportiche 1986)

¹⁶ The COMP-indexing analysis can still perhaps be maintained under the current analysis of WH-movement as movement to SPEC C if we hold that COMP indexing is mediated by SPEC-Head Agreement.

¹⁷ This marking is required (and permitted) only with non-PP adjuncts. Consider (i), where *gbU* is a postposition.

- (i) *yI gbU n ka suO dl/*dldO*
what reason you Fut-A tree-Det cut/*cut-M

(12c) *nū kòfi ká ml nU*
do Kofi F-Aux it do

'Kofi will do it'. (Koopman and Sportiche 1986)

(12d) *yEsO n dldOdlO suO la -*
how you cut-M-cut-M tree WH

'How did you cut the tree?' (Koopman and Sportiche 1986)

Movement in Vata differs from movement in Arawak in that (i) Vata lacks antecedent-government, as evidenced by the resumptive pronoun requirement in subject movement, (ii) Adjunct Morphology takes the form of affixes and reduplication rather than an independent auxiliary, and (iii) verb extraction involves a resumptive pro-form strategy rather than an Adjunct Morphology strategy. The two languages are similar, however, according to our understanding of the Koopman and Sportiche paper, in that they make the same distinction between manner adverbials on the one hand and time and location adverbs on the other hand.¹⁸ Movement of the former requires Adjunct Morphology, while the latter are treated in the same way as complements. As we saw, Yoruba partitions adverbials in a partially overlapping way.

An important question that arises is why in all of these languages the fronting of some adverbs does not require Adjunct Morphology. The solution developed above for Arawak—that the adverbs which do not require it are outside of VP and therefore antecedent-governed from COMP—does not extend to Yoruba and Vata since these languages have been argued to lack antecedent-government, as evidenced by the prohibition against subject traces. Among possible alternative solutions, we might consider extending an account developed by Huang (1983) for an asymmetry in Chinese and English movements in Logical Form (LF) which divides adjunct question phrases in a comparable way. Huang claims that the output of LF movement of objects in sentences like (13a) is well-formed because the resultant trace is lexically governed. On the other hand, LF movement of adjuncts, as in (13b), yields ill-formedness; since the trace has no lexical governor. (Antecedent-government is of course blocked in both cases since COMP is already indexed by the phrase which occupies it at S-Structure. These cases, therefore, are analogous to the corresponding cases of simple syntactic movement in Yoruba and Vata.) Huang notes, however, that (13c), in which the LF-moved phrase is a time or place adverbial, is relatively well-formed.

¹⁸ Koopman and Sportiche give no examples of movement of location or time phrases, referring the reader to Koopman and Sportiche (1985), to which we do not have access. However, the note in Koopman and Sportiche (1986:362) indicates that they behave in the same way as complements with respect to extractions.

(13a) *Tell me where you bought what*

(13b) **Tell me what you bought why*

(13c) *Tell me what you bought where/when*

A similar array of facts is found in the case of LF question movement out of WH-islands in Chinese. Thus, here again adverbials are partitioned with respect to their behavior under movement. The *when* type but not the *how* type can be LF-moved to a COMP already containing a WH-phrase. Huang accounts for this asymmetry by proposing that *where* and *when* are in fact objects of abstract prepositions, and when they are fronted at LF they leave traces which are properly governed by those prepositions. Crucially, for Huang, the prohibition against preposition stranding which is widespread across languages, even with partial effects in English, is not due to the ECP, but to a separate condition which does not hold at LF. LF extraction of the complement of these abstract Ps therefore produces no violation.

It would appear that we might similarly account for the absence of Adjunct Morphology in Arawak, Vata, and Yoruba with time and (in Arawak and Vata) location adverbials by claiming that these phrases are complements of abstract prepositions (or postpositions), and that the trace of movement is lexically governed by those stranded prepositions or postpositions. In fact, however, there are considerations which lead us to conclude that this is not the correct account for the observed asymmetry. In these languages, unlike the English example (13) and its counterparts in Chinese, the movement involved is overt syntactic movement, whose effects are reflected in phonological form. It is not LF movement. Thus, stranding of the hypothesized abstract preposition would have to have occurred prior to S-structure. This would be a possibility, however, only if the languages in question did not observe an S-structure (or PF) prohibition against preposition stranding. (14), from Carstens (1985), shows, though, that the stranding prohibition does hold for syntactic movements in Yoruba for example. An object of the preposition *ni* cannot be fronted by itself in the syntax; rather, pied piping is obligatory. Stranding of overt prepositions under movement is also not generally allowed in Arawak. (See Pet 1987:184ff. for discussion.)

(14a) [*Ni ori tabili*] *ni mo ti ri iwe re* [*t*]

On 'head' table Foc I Aux see book your

'On the table I see your book' (Carstens 1985)

(14b) *[*tabili*] *ni mo ti ri iwe re* [*ni ori t*]

Thus, stranding of abstract prepositions by syntactic movement in these languages would presumably be similarly precluded. Alternatively, we could perhaps claim that *where* and *when* question phrases do contain

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an abstract preposition/postposition but that it is carried along by movement, and that either (i) traces of PP movement, unlike NP traces, are not subject to the ECP, or (ii) the preposition/postposition is "reconstructed" back into place in LF, where it can properly govern the trace of its object (cf. Koopman and Sportiche 1986:367 for a proposal of the latter sort). There seems to be independent need for one or the other of these assumptions in Vata, where, as Koopman and Sportiche observe, overt movement of adjuncts which are clearly of the category PP does not require Adjunct Morphology, suggesting that the ECP does not hold for them. Similarly, in Arawak, we find that questioning of cause/purpose adjuncts, which we take to be VP-adjuncts on semantic grounds, also does not require *a*-insertion—unlike questioning of manner adjuncts. The relevant difference between the two types of adjunct again seems to be that cause/purpose adjuncts are expressed as postpositional phrases, as in:

(15a) [ama doma] b-osy-pa jon-ro
 what 'because' you-go-fut there-to

(15b) [ama-bia] thy-jentoa-bo
 what 'in order to' she-cry-cont

Therefore, in Arawak too, traces left by movements of PP must in one way or another be exempted from the ECP. This being the case, it would in principle be possible to claim for these languages that the absence of adjunct morphology in *when* and *where* questions is explainable in a similar way, except that the postposition happens not to be phonologically realized.

There are, however, some reasons for not adopting this solution either. First, it is apparently not sufficiently general, since it does not provide a correct account for the distribution of Adjunct Morphology in Yoruba. In that language, as we observed, *when* questions do not require Adjunct Morphology and, as indicated in the gloss of (11e), 'when' in Yoruba does have the internal structure of a PP. However, as shown by example (14a), Adjunct Morphology, in the form of the auxiliary, is required in location-phrase fronting (for nonsubcategorized location phrases) even when the fronted phrase is a PP. This suggests at least that PP categorial status does not automatically exempt an adjunct trace from that requirement. Moreover, the account is at least not a very satisfying one for Arawak, since there appears to be no corroborating evidence for the claim that *where* and *when* question phrases in Arawak, or time adverbs such as 'yesterday' in (3b), are PPs with abstract heads.

To recapitulate, then, we have the following situation. Time phrases in Arawak, Yoruba, and Vata and locative phrases in Arawak and Vata pattern like complements with respect to movement in that fronting of

such elements, unlike fronting of manner phrases, requires no Adjunct Morphology. It must be concluded, therefore, that the positions occupied by the traces of those phrases either are properly governed even in the absence of Adjunct Morphology or they represent categories not subject to the ECP. The assumption that they are antecedent-governed from COMP suffices for Arawak but not for Yoruba and Vata, since these languages are claimed not to have antecedent-government, as evidenced by the prohibition against traces in subject position. The assumption that the traces of *when*-type phrases are governed by a stranded abstract preposition is problematic in Yoruba and Arawak. Syntactic movements are demonstrably subject to the stranding prohibition in these languages, and extraction from the position of complement of such an abstract preposition would presumably violate that prohibition as well. Finally, it is also not sufficient to claim that the fronted phrases are themselves PPs which leave behind PP traces not subject to the ECP. As (14c) shows, in Yoruba some PP adjunct frontings are obligatorily accompanied by Adjunct Morphology, whose occurrence, we have claimed, is motivated by the ECP.

Thus, it appears that the only remaining possibility sufficient to account for the relevant cases in all three languages is that extraction from the positions of, e.g., time phrases does not require adjunct morphology because those positions are properly governed by INFL (even in the absence of Adjunct Morphology). We note further in Vata and Yoruba, however, where the obscuring effect of antecedent-government is removed, that INFL does not seem properly to govern the SUBJECT (even in the presence of Adjunct Morphology). In both cases, resumptive pronouns strategies are necessary in subject questions. We conclude that INFL properly governs *when*-type adjuncts but not subjects, presumably because subjects do not stand in the same relationship to INFL as do time phrases (or, in Arawak and Vata, location phrases). We suggest accordingly that subjects are daughters of IP, while the adverbs in question are daughters of I'. We assume further that only sister phrases of X⁰ heads (or elements contained within such phrases, so long as no barriers or closer potential governors intervene) are properly governed by those X⁰ heads. Elements attached at higher levels are not. In other words, *when*-type adverbs are claimed to behave as complements with respect to Adjunct Morphology because they have the status of complements of INFL and are therefore properly governed by it.¹⁹ Subjects, however, are not. We have represented this claim in (5). For temporal

¹⁹ However, it still must be possible to distinguish them from direct objects, since, for example, in English, DOs but not *when*-phrases allow long movement. (This is illustrated in *i* and *ii*, where the judgments are somewhat obscured by the effects of subjacency.)

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adverbials, at least, the claim is perhaps rendered more plausible by the close semantic relationship holding between time adverbs and the tense features of INFL. *How*-type adjuncts are not governed by the verb because they are not sisters to it, nor by INFL because a barrier, in the form of the VP, intervenes. However, Adjunct Morphology lexicalizes INFL, which then L-marks VP and thereby removes the barrier, allowing the proper government of the traces of these adjuncts by INFL (as well as antecedent-government from COMP, where this is available).

Finally, let us consider the hypothesis advanced by Aoun et al. (1987) to account for the observed difference in extractability between *how*-type adjuncts and *when*-type adjuncts. Aoun et al. attempt to derive this difference from Binding Theory, instead of the ECP. They suggest that we can assume, following Andrews (1982), that all adjuncts—"S-adjuncts" as well as "VP-adjuncts"—are actually within VP—and that they therefore satisfy the lexical government requirement of the ECP, under the assumption that a head properly governs all elements within its projection.²⁰ In addition, however, according to Aoun et al., at LF the traces

(i) ?? *What_i do you wonder [when he bought t_i]?*

(ii) * *When_i do you wonder [what he bought t_i]?*

(We are grateful to Edwin Williams for bringing this difference to our attention.)

We may make the necessary distinction by assuming that, while it is a complement of INFL, a *when*-adverbial does not receive a θ -role from INFL, and by assuming further, with Koopman and Sportiche, that a condition like (iii) holds at S-structure, independently of the ECP:

(iii) Condition on Long Extraction: X is a possible Long Extraction Site iff X is a θ -position.

Koopman and Sportiche argue that such a condition is necessary in Vata because PP adjuncts, whose traces apparently are not subject to the ECP (since they do not require Adjunct Morphology) nonetheless cannot undergo long extraction. The two principles—the ECP and (iii)—will intersect to yield the following typology of traces: (a) true object traces, which require no Adjunct Morphology in any of the languages considered and which occupy θ -positions, allowing their antecedents to undergo Long Extraction where this is possible at all; (b) INFL-complement traces (*when*-type traces), which are properly governed by INFL, thereby satisfying the ECP, but which do not get θ -roles, and are therefore not possible Long Extraction sites; and (c) VP-adverbial traces, which in languages of the type under discussion come to be properly governed only because the introduction of Adjunct Morphology has removed the VP as a barrier and opened up the possibility of external government. The latter of course also do not allow long extraction.

²⁰ Note that under this characterization of proper government the contrast between:

(i) [*About what*]_i did you write [_{NP} [_{N'} books t_i]]?

(ii) * [*Under what*]_i did you write [_{NP} the [_{N'} books] t_i]?

cannot be attributed to a difference in proper government (cf. Huang 1983:564). We have assumed, to the contrary, that proper government is in fact satisfied only under conditions of SISTERHOOD with a lexical head.

of both types of elements must satisfy the requirements of Generalized Binding Theory, to which the antecedent-government cases of the ECP are held to reduce. They claim that all traces are anaphors, hence subject to the generalized Principle A, which requires them to be (A')-bound in the domain of the lowest SUBJECT accessible to them.²¹ Accessibility is defined as in Aoun (1981:37).

- (16) α is accessible to β iff β is in the c-command domain of α and coindexing of (α, β) would not violate any grammatical principle (Aoun 1981:37; emphasis added).

Traces of *when* and *where*, however, are also referential expressions, hence subject to Principle C of the Binding Theory, which requires that they be argument-free in all domains. The consequence of this is that they lack such a domain. The AGR(ELEMENT) element of the clause containing them (or of any higher clause) is not accessible to them, as accessibility is defined in (16), since AGR is coindexed with the subject NP by subject-INFL agreement and coindexing between *when* or *where* traces and AGR would entail assigning them the same index held by the subject coindexed with AGR. This would result in a Principle C violation. Similarly, subject NPs of the clauses containing traces of *when* and *where* also do not constitute accessible SUBJECTs with respect to those traces, for the same reason; coindexing them with such subjects would violate Principle C. Accordingly, lacking a binding domain, the traces of *when* and *where* do not need to be locally bound (or, in terms of earlier formulations, antecedent-governed).²² On the other hand, the traces of *why* and *how* are not referential expressions but pure anaphors, not subject to Principle C. Coindexing these anaphors with AGR will accordingly not result in a violation of Principle C (or any other principle), and AGR is therefore an accessible SUBJECT with respect to them. They must therefore be bound in the domain of the local AGR. This is responsible for such differences as that between (13b) and (13c), under standard assumptions about COMP indexing.

It is not at all clear, however, that all of the relevant differences between the two types of adjuncts can be derived from Generalized Binding Theory in this way. In particular, we do not believe that their difference with respect to Adjunct Morphology can be so derived. Koopman and Sportiche (1986:373) observe that adjunct movement in Vata is

²¹ SUBJECT is defined as AGR (the AGREEMENT element of INFL) if it is present, the subject NP ([NP,XP]) otherwise. Cf. Chomsky (1981:209).

²² Thus, according to Aoun et al., *when* and *where* traces have the same status with respect to Generalized Binding Theory as do Direct Object traces. That being the case, it is not clear how contrasts like the one in n. 19 are to be accounted for.

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subject to two restrictions, and that at most Generalized Binding can possibly explain one or the other of them, but not both. First, fronting of (some types of) adjuncts requires Adjunct Morphology, and second, "long extraction" of adjuncts (e.g., out of WH-islands) is prohibited even in the presence of Adjunct Morphology. (Objects, on the other hand, can undergo long extraction.) They observe that if the prohibition against long extraction of adjuncts is attributed to Generalized Binding, the additional requirement of Adjunct Morphology still has to be stipulated independently. Alternatively, they consider the possibility that the Adjunct Morphology requirement might be derived from Generalized Binding. They propose that perhaps in Vata the domain for Generalized Binding might be S, not S', and suggest that Adjunct Morphology might be construed as serving as an S-internal antecedent for (purely anaphoric) adjunct traces, thus allowing them to be bound in S, as required. The problem under this alternative is that if an adjunct trace satisfies Principle A in this way (being locally bound by the Adjunct Morphology, and not the moved phrase), then in the absence of an additional principle it should be predicted that the moved element, since not required as a local binder, should be free to undergo long movement, contrary to fact.

Koopman and Sportiche conclude, therefore, that two separate principles are involved here: Adjunct Morphology is needed in order to satisfy the ECP by lexically governing adjunct traces, and long-distance extraction of adjuncts is ruled out by a principle prohibiting long extraction from nonargument positions. They argue, moreover, that the latter condition can probably not be identified with Principle A of the Generalized Binding theory. The reader is referred to their paper for the argument.

In Arawak, the question of long extraction of adjuncts does not arise, since Arawak does not admit long movement of any sort. As noted earlier, WH-movement is clause-bounded. However, Arawak does provide further evidence against the possibility that the Adjunct Morphology requirement (and its differential treatment of *when*-adjuncts and *how*-adjuncts) can be derived from Generalized Binding theory. Suppose we suggested, along the lines considered for Vata by Koopman and Sportiche, that S, not S', is the domain in Arawak for Generalized Binding, and that the function of the dummy verb is actually to serve as a sort of S-internal antecedent for purely anaphoric adjunct traces so that they can satisfy Principle A by being bound in S. In fact, this possibility is not very attractive from the outset, since the dummy verb *a* is clearly verblike, taking agreement and tense affixes just as a normal verb does. A further problem with this proposal arises in Arawak, however, where, unlike Vata, it is possible to have a trace in subject position (even in the

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absence of Adjunct Morphology). Under the assumption that S is the binding domain for Generalized Binding in Arawak, such a trace would also be free in its binding domain and should therefore violate Principle A. If the motivation of dummy insertion were in fact to provide an antecedent within S for traces subject to Principle A, we would expect that subject traces, too, should have to be bound to such a "dummy antecedent." Yet *a*-insertion is not required here.²³ We conclude, therefore, that dummy verb insertion in *how*-type adjunct questions in Arawak cannot be attributed to Generalized Binding Theory in the manner proposed. Accordingly, it appears not to be the case that, as suggested in Aoun et al., the differences between *when*- and *how*-type adverbials derive solely from their different status with respect to Binding Theory.

In conclusion, we note that the dummy auxiliary construction in Arawak has one property for which we do not at present have an explanation. In normal event sentences in Arawak, subjects may take the form of independent pronouns, as in (17a), subject clitics, as in (17b), or full noun phrases, as in (17c).²⁴ In sentences with dummy verbs, however, subjects can apparently only be expressed as clitics. Compare the three examples in (18).

(17a) *li simaka-o*
he call-us

'He called us'.

(17b) *l-osa-bo ly-kabojan ninro*
he-go-cont his-planting-ground to

'He is going to his planting ground'.

(17c) *Miaka aba wadili sika khali da-myn*
Yesterday a man gave cassava-bread me-to

'Yesterday a man gave cassava bread to me'.

(18a) *Ma-siki-n l-a-bo iniabo by-myn*
Priv-give-Subord he-Aux-Cont water you-to

'He will not give water to you'.

²³ Note also that, since Generalized Binding theory is held to apply at LF, the Vacuous Movement Hypothesis of Chomsky (1986:49-59) provides no way around this problem; that hypothesis allows subject WH-phrases to remain in situ at S-structure, and therefore subject questions without traces are possible at that level. However, all unmoved WH-phrases must be moved at LF, leaving traces which are subject to Generalized Binding. In fact, there is direct evidence, as noted above, that subject question phrases are moved at some level in Arawak.

²⁴ The latter possibility is subject to some discourse restrictions. Cf. Pet (1987).

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(18b) **Ma-siki-n* *li-a-bo* *iniabo by-myn*
 Priv-give-Subord he-Aux-Cont water you-to
 ('He will not give water to you')

(18c) **Ma-siki-n* *li wadili a-bo* *iniabo by-myn*
 Priv-give-Subord the man Aux-Cont water you-to
 ('He will not give water to you')

We suspect that this fact will ultimately find an explanation within the framework of Case Theory.

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