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Adverbial Subordinators and Word Order Asymmetries

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I present evidence in this paper for a universal preference for clause-initial adverbial subordinators (subordinate conjunctions marking subordinate clauses) over clause-final subordinators. The evidence cited is based on a database containing word order characteristics for a crosslinguistic sample of 625 languages (cf. Dryer 1989b, 1991, 1992). This preference is somewhat similar to a preference for placing relative clauses after nouns, in that both preferences can be seen as manifestations of a more general universal preference for single words to precede clausal constituents with which they combine, suggesting that the two preferences reflect the same explanatory principle. Hawkins (1990) proposes that the universal preference for placing relative clauses after nouns reflects the effect of the parsing principle of Minimal Attachment. But I argue here that Hawkins' account of the preference for NRel order will not extend in any obvious fashion to the preference for clause-initial subordinators.

1. Relative Clauses

Hawkins (1990) and Dryer (1992) observe that there is an asymmetry in the distribution of the two orders of relative clause and noun with respect to the two orders of object and verb. Namely, of the four possible types of languages defined by these two parameters, three are common while one is quite rare. Table 1 summarizes the data given in Dryer (1992) for the four types. The numbers represent the number of genera containing languages of each sort, where genera are genetic groups comparable to the subfamilies of Indo-European.[1]

Table 1
Order of verb/object and order of noun/relative clause: number of genera

	NRel	RelN
VO	60	1
OV	37	26
Total	97	27

Table 1 shows that while both orders of noun and relative clause are common in OV languages (37 NRel and 26 RelN), VO languages are overwhelmingly NRel (60 to 1). Only one genus contains languages that are VO and RelN and that is the genus consisting of the various so-called dialects of Chinese.

There are a number of ways to look at the distribution of numbers in Table 1. On the one hand, we can say that they support the almost exceptionless *implicational* universal given in (1), or the logically equivalent statement given in (2).

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[1] The data in Table 1 is based on 248 languages. The other languages in my database are ones which cannot be classified into one of the four types given in Table 1, either because I lack sufficient data for one of the two parameters or because the language does not fall clearly into one of the four types. For example, the language may be OV/VO, without either order basic; or the language may employ internally-headed relative clauses and thus be neither NRel nor RelN.

(1) If a language is VO, then it is NRel.

(2) If a language is RelN, then it is OV.

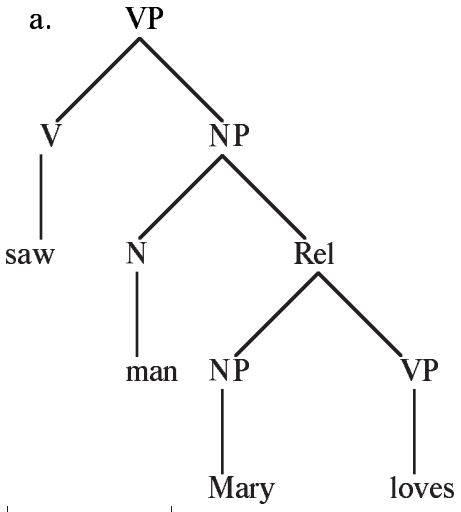
We can also say that the numbers in Table 1 support the claim that, while NRel order may be slightly more common than RelN among OV languages, there is still a *correlation* or *association* between the order of verb and object and the order of noun and relative clause in the sense that an OV language is significantly more likely to be RelN than a VO language is (see Dryer 1992). Another thing we can say about the distribution in Table 1 is that it reflects an *asymmetry* between VO and OV languages (see Hawkins 1988, 1990): while one order is predominant among VO languages, both orders are common among OV languages.

One way to talk about the distribution in Table 1 is to see it as the result of two competing factors or motivations governing the position of relative clauses. This approach, originally suggested by Greenberg (1963: 97-98), but pursued by Dryer (1988) and Croft (1990: 54-57), is to view distributions like that in Table 1 as involving two types of principles, a *harmony principle*, by which there is an association or correlation between two typological parameters, and a *dominance principle*, by which one value for a single parameter is preferred over its other possible value(s). In Table 1, the harmony principle is one whose effect is that the order of noun and relative clause tends to be in harmony with the order of verb and object. While it is widely assumed that this harmony principle is a principle favouring consistent order of heads and dependents, it is argued in Dryer (1992) that this is really a principle favouring consistent branching direction, favouring consistent left-branching and consistent right-branching over mixed branching. The dominance principle in Table 1 is one that results in a preference for NRel order over RelN order: overall, NRel order (found in 97 genera) and is more than three times as common as RelN (found in only 27 genera). These two principles interact differently in VO and OV languages. In VO languages, they both favour NRel over RelN: VO&NRel conforms to both principles while VO&RelN, the rare type, conforms to neither. OV languages, however, cannot simultaneously satisfy both principles. If they are RelN, they conform to the harmony principle but not the dominance principle; if they are NRel, they conform to the dominance principle but not the harmony principle.

The notions of harmony principle and dominance principle are first steps towards explaining distributions like those in Table 1: they describe the more complex distribution in terms of the interaction of two more basic principles. But clearly such principles are not in themselves explanations. If such principles play a role in explaining the distribution in Table 1, it is only because the distribution is due to whatever is the explanation *for* these two principles. To explain the distribution in Table 1, we need to explain why the order of noun and relative clause tends to be harmonic with the order of verb and object and we need to explain why there is a preference for NRel order over RelN order. There exists considerable literature offering possible explanations for the harmony principle at work here (cf. Dryer 1992), but relatively little on the dominance principle at work here. Hawkins (1990) offers an explanation for both of these principles in terms of language processing. He discusses two processing principles, one which he calls *Early Immediate Constituents*, which has the effect of favouring consistent direction of branching and thus a possible explanation for the harmony principle at work in Table 1, and a second principle, *Minimal Attachment* (cf. Frazier 1978), which has the effect of favouring NRel over RelN and which is thus a possible explanation for the dominance principle at work in Table 1.

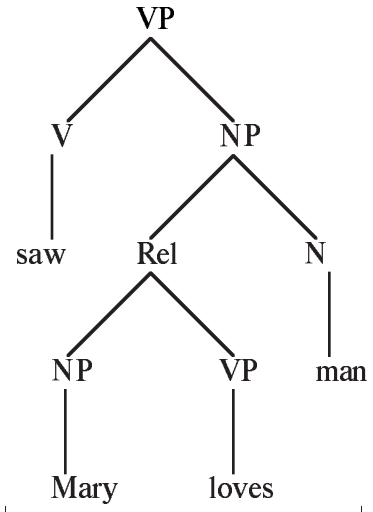
The predictions of Hawkins' two principles for four schematic examples illustrating the four orders in Table 1 are given in (3) and (4).

(3) a.



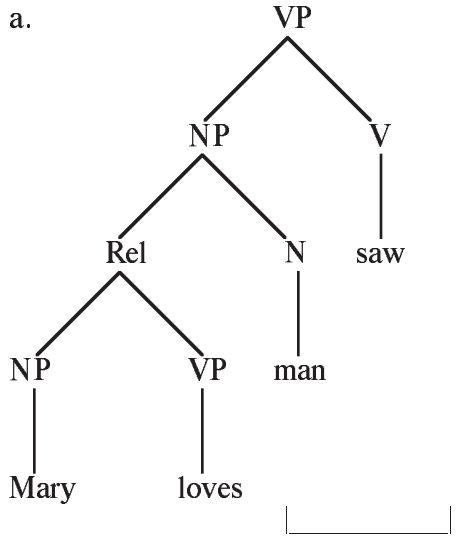
EIC ratio=100%
MA=best

b.



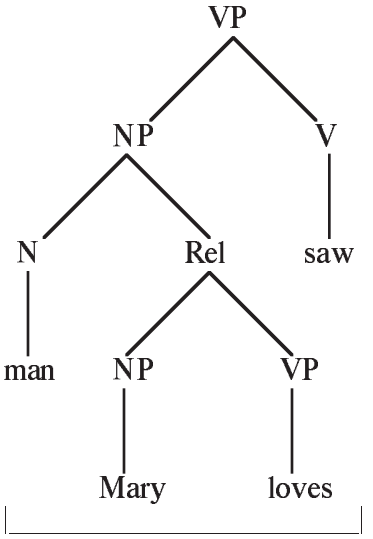
EIC ratio = 79%
MA=bad

(4) a.



EIC ratio=100%
MA=worst

b.



EIC ratio = 58%
MA=best

I will not discuss here Hawkins' principle of Early Immediate Constituents (EIC) or his method for computing the EIC ratio; see Hawkins (1990) for discussion of this. What is of primary concern here is the appeal to Minimal Attachment (MA) to explain the preference for NRel over RelN. Minimal Attachment is a parsing principle by which incoming material is attached to the parse tree that has been constructed up to that point in the parse in such a way that the fewest possible nodes are posited. In (3b), for example, Minimal Attachment predicts that when the noun *Mary* is processed, it will be attached directly as a daughter of the VP node (since that requires the fewest new nodes), and thus interpreted, at least temporarily, as the object of the verb *saw*. Only after encountering the next word will the hearer realize that *Mary* is not the object of *saw*, and an adjustment to the parse will be necessary. The OV&RelN structure in (4a) also presents a possible problem for Minimal Attachment, although here we must assume a preceding subject, as in (5).

(5) John [Mary loves] man saw.

Whether or not the noun *John* in (5) is marked morphologically as subject, and whether or not the noun *Mary* is marked morphologically as object, a natural parse of (5) at the point where the verb *loves* is encountered is one whereby we have a clause with *John* as the subject, *Mary* as the object, and *loves* as the verb. Only later will it become clear that this is the wrong parse. But the incorrect original parse that treats *John Mary loves* as a clause will be favoured by Minimal Attachment until some point after the verb *loves* has been encountered, since that will be the parse that involves the fewest nodes at that point.[2]

2. Adverbial Subordinators

The universal preference for NRel order over RelN order is only one of a number of cases in which there is a constituent X consisting of a single word that combines with a second constituent Y that consists of a clause, and in which there is a preference for the two constituents X and Y to occur in the order XY rather than YX. These include the five preferences given in (6).

(6) a. NRel > RelN
b. V + Sentential Subject > Sentential Subject + V
c. V + Sentential Object > Sentential Object + V
d. Complementizer + S > S + Complementizer
e. Adverbial Subordinator + S > S + Adverbial Subordinator

The preferences in (6b), (6c), and (6d) have been discussed elsewhere by Dryer (1980) and Hawkins (1990). In this paper I will discuss the evidence for the preference in (6e).

By an adverbial subordinator, I mean a word that marks an adverbial subordinate clause for its semantic relation to the main clause. In English, this includes such words as *while, when, after, because, although,* and *if*.[3] In some languages, such meanings are expressed by words that occur at the *end* of the clause, rather than the beginning of the clause the way they do in English and most other European languages. The examples in (7) are examples illustrating clause-final subordinators.

(7) a. Ijo (Niger-Congo)

ọ	duma	tún	timi	*sèribi,*	arí	waịí	bó-mi
3PL	song	sing	CONT.PAST	*while*	I	turn	come-PAST

While they were singing, I returned. (Williamson 1965: 78)

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2 There are a variety of possible complications associated with other possible factors (such as what if the verb in the relative clause is marked as subordinate, or specifically as a verb of a relative clause), but I will ignore these here, since my goal is to argue that even if one accepts the logic of Hawkins' account of the position of relative clauses, it will not extend in any obvious fashion to the position of adverbial subordinators.

Note that the MA for (4a) is marked 'worst', while that in (3b) is just marked 'bad', because it will often take longer for the parser to realize that the minimal attachment parse of (4a) was wrong than it will for (3b).

3 *If*-clauses are perhaps less obviously adverbial compared to the other types mentioned here. They do correspond in English to adverbial expressions beginning with *in case of*.

b. Siroi (Trans - New Guinea; Papua New Guinea)

ne kila *kande* ne nzumil nda-k-ate kande
2SG know *if* 2SG laugh NEG-CM-2SG,PRED but
If you knew, you wouldn't laugh. (Wells 1979: 119)

c. Slave (Athapaskan)

ʔalee síchú *ʔekú* bekáʔehtʼe kʼeodehshǫ́ íle
first 1SG,was.married *when* 1SG,cooked 1SG,knows NEG
When I first got married, I couldn't cook. (Rice 1989: 1057)

d. Paumarí (Arauan, Brazil)

vada o-ni-na *kabaʔi* kha-ʔa-ha ada jara
look 1SG-AUX-DEP,INTRANS *while* MOT-ASP-THEME DEM,M non.Indian
While I was looking, the non-Indian came. (Chapman & Derbyshire 1991: 228)

For the purposes of this paper, I restrict attention to adverbial subordinators that are separate words, rather than verbal affixes. Thus, morphemes like the suffix *-àl* 'although' on the first word in the Kiowa example in (8) are excluded from consideration here.

(8) Kiowa (Tanoan)

a. à-dę̀·+kʼɔ́··àl hón àn à-dę̀·+hę́·m-ɔ̂·
1SG-sleep+lie-although NEG HAB 1SG-sleep+die-NEG
Although I lie down, I can't fall asleep. (Watkins 1984: 242)

Table 2 gives the data for the relationship between the order of adverbial subordinator and clause and the order of verb and object.[4]

Table 2
Order of verb/object and order of adverbial subordinator/clause: number of genera

	InitialSub	FinalSub
VO	59	1
OV	17	38
Total	76	39

Table 2 shows clear evidence of a correlation between the order of verb and object and the order of adverbial subordinator and subordinate clause: VO languages overwhelmingly tend to employ clause-initial subordinators (by 59 to 1) while OV languages more often employ clause-final subordinators (38 to 17). But we also find an asymmetry here: among the two "inconsistent" types, one is considerably more common than the other. While initial subordinators are not uncommon in OV languages (the 38 genera containing OV&FinalSub languages outnumber the 17 genera containing OV&InitialSub languages by barely 2 to 1), my database contains only one instance of a VO language employing clause-final

4 The data in Table 2 is based on 223 languages for which I have data allowing them to be classified into one of the four types given.

subordinators.[5] This language is Guajajara, a Tupi-Guarani language of Brazil. Guajajara normally employs VSO order, as in (9).

(9) Guajajara

u-ʔu kuzə məɪ
3-eat woman mango
The woman ate the mango. (Harrison 1986: 409)

However, Guajajara is an unusual verb-initial language in many respects. Significantly, though it is normally VSO in main clauses, it is normally verb-final in dependent clauses, as in (10), which also illustrates the use of a clause-final subordinator.[6]

(10) ce typyz me he-rur mehe
here house to it-bring when
when bringing it here to the house (Bendor-Samuel 1972: 144)

Guajajara is also atypical as a verb-initial language in employing postpositions rather than prepositions, illustrated by the postposition *me* 'to' in (10).

It is also worth examining the relationship between the position of adverbial subordinators and the position of adpositions. We might expect a stronger correlation here because of their semantic similarity; adverbial subordinators indicate semantic relationships between an adverbial clause and the main clause while adpositions indicate semantic relationships between a noun phrase and a verb. In many languages, the set of adverbial subordinators overlaps with the set of adpositions. In English, for example, the words *after* and *before* function either as adverbial subordinators or as prepositions, as illustrated in (11) for *after*.

(11) a. John went home *after* he had watched the game.
b. John went home *after* the game.

Furthermore, the two-word preposition in English *because of* is similar in form to the adverbial subordinator *because*, and they have essentially the same meaning, as in (12).

(12) a. *Because* it was raining, the picnic was canceled.
b. *Because of* the rain, the picnic was canceled.

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5 Paumarí, the language illustrated above in (7d) is a second possible instance of a VO language with clause-final adverbial subordinators. While it is clear that the language employs clause-final subordinators (cf. Chapman and Derbyshire 1991: 227-230), it is not clear whether the language should be classified as VO. They do describe SVO as the basic word order (p. 164), but it is not clear whether VO is basic for clauses in which the subject is realized only by the verb morphology; in subordinate clauses they describe the normal orders as being SVO and OV "with OV predominating". What is not clear from their discussion is whether VO predominates in main clauses.

6 The clause-final subordinator *mehe* in (10), which Bendor-Samuel (1972) represents as a separate word, is represented by Harrison (1986: 411) as a suffix on the verb.

Furthermore, the examples in (13) through (15) show pairs of adverbial subordinator and preposition or prepositional expression in English that correspond in meaning (though sometimes with some differences).[7]

(13) a. *Although* it was raining, we went for a hike.
b. *Despite* the rain, we went for a hike.

(14) a. *If* it rains, we will stay home.
b. *In the event of* rain, we will stay home.

(15) a. *While* we were watching the game, John was eating lunch.
b. *During* the game, John was eating lunch.

The data for the crosslinguistic relationship between the position of adpositions and position of adverbial subordinators is given in Table 3.

Table 3
Order of adposition/NP and order of adverbial subordinator/clause: number of genera

	InitialSub	FinalSub
Prep	52	0
Postp	12	35
Total	64	35

The data in Table 3 is similar to that given in Table 2 for the association of order of verb and object with order of adverbial subordinator and clause. Again we have an asymmetry: there are 12 genera containing languages of the inconsistent type Postp&InitialSub, but no instance of a language of the inconsistent type Prep&FinalSub. We can describe these facts with the implicational universal stated in (16), or the equivalent generalization in (17).

(16) If a language is prepositional, it will employ clause-initial adverbial subordinators.

(17) Clause-final adverbial subordinators only occur in languages with postpositions.

I am not aware of any exceptions to these generalizations.[8]

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7 Proposals (e.g. Klima 1965, Jackendoff 1977) that adverbial subordinators in English should be treated as prepositions which subcategorize for clausal complements rather than noun phrase complements would capture these parallelisms.

8 The universals in (16) and (17) are stated in a way that ignores the possibility of languages that do not have adpositions at all or that do not employ adverbial subordinators at all (the relevant meaning being coded, if at all, by nominal and/or verbal affixes). Thus there may be languages with clause-final subordinators that are not postpositional, but only because they do not employ adpositions at all. The formulation of (16) and (17) also ignores the case of languages with both prepositions and postpositions and languages with both clause-initial adverbial subordinators and clause-final adverbial subordinators. A more precise statement of (16) that incorporates these considerations is given in (i).

(i) If a language employs adpositions, and if it employs prepositions more than it employs postpositions, and if it employs adverbial subordinators, and if those adverbial subordinators are more often clause-initial or more often clause-final (rather than both being common), then those adverbial subordinators will more often be clause-initial.

Despite the semantic similarity between adverbial subordinators and adpositions, and despite the lack of Prep&FinalSub languages in my data, the opposite "inconsistent" type, Postp&InitialSub, is not uncommon: the data in Table 3 show it to be outnumbered only three to one by the consistent type Postp&FinalSub. A list of the 12 genera containing Postp&InitialSub languages, with the names of the languages in each genus exhibiting the characteristic, is given in (18).[9]

(18) Northern Khoisan: Xu
Mande: Susu, Vai, Gambian Mandinka, Mende
Gur: Toussian, Kirma
Kwa: Fanti, Nkonya, Lelemi, Ewe
Songhai
Armenian: Modern Armenian
Indic: Shina, Hindi, Urdu, Punjabi, Maithili
Finnic: Finnish
Kartvelian: Georgian
Tibetic: Magari
Klamath
Taracahitic: Yaqui

Examples from some of these languages are given in (19) through (22). The (a) examples illustrate the use of postpositions in these languages, while the (b) examples illustrate clause-initial subordinators.

(19) Songhai (Nilo-Saharan)

a. a huru hugo *ra*
3SG enter house *in*
He entered the house. (Prost 1956: 89)

b. *nda* bor-ey ga don borio, i ga gan borio
if person-PL PRES sing well 3PL PRES dance well
If people sing well, they dance well. (Prost 1956: 147)

(20) Fanti (Kwa; Niger-Congo)

a. mí-fí´e wo nú-fí´e *nú-nkén*
1SG-house be.at 3SG-house *3SG-near*
My house is near his house. (Welmers 1946: 53)

b. *ansáńa* mí-baà há-nu mi-tîi aburo-kí´r
before 1SG-come here 1SG-live abroad
Before I came here, I lived abroad. (Welmers 1946: 72)

These kinds of complications are apparently assumed in the statement of universals in Greenberg (1963) and Hawkins (1983). See below for some discussion of languages with both prepositions and postpositions or both clause-initial subordinators and clause-final subordinators.

9 I have not had the opportunity to recheck a number of the languages listed here to confirm that they are indeed Postp&InitialSub and it is possible that the list contains some errors.

(21) Finnish[10]

a. kävel-i-n katu-a *pitkin*.
walk-PAST-1SG street-PART *along*
I walked along the street. (Tuominen 1977: 9)

b. *koska* poika voitt-i, hän laulo-i.
because boy win-PAST,3SG 3SG win-PAST,3SG
Because the boy won, he sang. (Tuominen 1977: 31)

(22) Hindi

a. vah dūkān *par* nahīm hai
3SG shop *LOC* NEG be,PRES,3SG
He's not in the shop. (McGregor 1972: 31)

b. *jyoṁhī* vahāṁ pahuṁc-ūṁ-gā tyoṁhi patr likh-ūṁ-gā
as.soon.as there arrive-1SG-FUT,MASC then letter write-1SG-FUT,MASC
I will write as soon as I get there. (McGregor 1972: 125)

3. Doubling

The generalization that prepositions imply clause-initial subordinators also shows up with a number of cases of what Hawkins (1983) calls *doubling*, where both prepositions and postpositions or both clause-initial and clause-final subordinators exist in the language. Three types of doubling with adpositions can be distinguished. The first, and apparently most common type of doubling, involves languages, like Finnish, in which there are some adpositions which are prepositions and some adpositions which are postpositions, though any given adposition will be specifically a preposition or a postposition. Thus the Finnish example in (21a) above illustrates a postposition *pitkin* 'along', while (23) illustrates a preposition *ilman* 'without'.

(23) Finnish

ol-e-n ilman raha-a.
be-PRES-1SG without money-PART
I am without money. (Tuominen 1977: 8)

In the case of a number of languages which have both prepositions and postpositions, one of these can be treated as dominant, either because it has greater token frequency (the language has more prepositions than postpositions) or text frequency (texts in the language usually contain more prepositions that positions). For example, while Finnish has both prepositions and postpositions, postpositions are apparently dominant. In other cases, neither order is clearly dominant.

A second type of doubling with respect to adposition type involves instances where a particular adposition can either function as a preposition or function as a postposition, as in the examples in (24) from O'odham (formerly Papago), a Uto-Aztecan language, where the adposition *wiim* 'with' is a preposition in (24a) but a postposition in (24b). The two

10 As noted below, Finnish has both prepositions and postpositions but the latter are apparently more numerous.

uses differ in morphological markedness – in (24a), the preposition bears a suffix *-ǰ* that otherwise occurs on possessed nouns and the noun occurs with an article, both of these absent in (24b) – but it is not clear that one use is more frequent than the other, or that there is any other sense in which one is more marked than the other. The morphological markedness of (24a) apparently simply reflects the fact that it is the newer construction (cf. Givón 1976, Dryer 1989a).

(24) O'odham (Papago)

a. wɨ̱ma-ǰ g huan
with-POSS ART Juan
with Juan

b. huan wɨ̱m
Juan with
with Juan (Saxton 1982: 189)

A third type of doubling with respect to adposition type involves instances where a preposition and a postposition occur simultaneously, creating what might be called an *ambiposition* (analogous to the notion of an *ambifix*, part of which is prefixal and part of which is suffixal). The example in (25) illustrates this possibility in Pashto.

(25) Pashto (Indo-Iranian)

a. pə kor ki
PREP house LOC
in the house (Shafeev 1964: 51)

b. də də pasé
PREP 3SG after
after him (Shafeev 1964: 51)

The postpositions in these examples have a more specific meaning than the prepositions and it appears that they must occur with a preposition occurring simultaneously. The prepositions, in contrast, lack a specific meaning when used in combination with postpositions, and can also be used without a postposition, in which case they have more specific meanings, as in (26). For example, while the preposition *pə* means 'instrumental' when used alone, as in (26a), it is difficult to assign it a meaning when it is used in combination with a postposition, as in (25a).

(26) a. pə kalám likə́l
INSTR pen write
to write with a pen (Shafeev 1964: 51)

b. də kóra vatə́l
out.of house go
to go out of a house (Shafeev 1964: 51)

Similar cases of doubling occur with adverbial subordinators. Some languages employ both clause-initial subordinators and clause-final subordinators. This is illustrated in (27) from Kanuri in which *kawu* 'before' in (27a) is a clause-initial subordinator, while *yaye* 'even if' in (27b) is a clause-final subordinator.

(27) Kanuri (Saharan; Nilo-Saharan)

a. *kawu* nji yakin-də-ro bəri bukin.
before water drink,1SG,IMPF-DET-DAT meal eat,1SG,IMPF
I will eat before I drink water. (Hutchison 1976: 141)

b. koko suro yange-be nz-əgərənyi *yaye*, letsamnyi
frog inside pants-GEN 2SG-bite,3SG,NEG,PERF *even.if* sleep,2SG,NEG,FUT
Even if the frog inside of your pants doesn't bite you, you won't sleep.
(Hutchison 1976: 130)

Some language employ simultaneous clause-initial and clause-final subordinators. Fanti, for example, which primarily employs clause-initial subordinators, illustrated above in (20), also employs a construction where clause-initial and clause-final subordinators co-occur, as in (28).

(28) Fanti

se mi-wi´é *a* mí-kò fí´e
when 1SG-finish when 1SG-go home
When I'm finished, I go home. (Welmers 1946: 72)

The meaning of *when* in (28) is conveyed by the simultaneous use of the clause-initial word *se* and the clause-final word *a*.

In what follows I will ignore cases of doubling in which one order can be designated as dominant, and I will restrict my attention to what I will call *true doubling*, by which I mean cases where neither order is dominant. I will refer to the true doubling cases as 'Prep/Postp' and 'InitialSub/FinalSub'. Languages in my database are only partially coded for cases of true doubling, so the data cited here is rather limited. But there are 17 languages coded as having true doubling either for position of adpositions or for position of adverbial subordinators.[11] Four of these languages exhibit doubling on adposition type, but I do not have information on adverbial subordinators, so these four languages are excluded here. Of the remaining 13 languages, 7 are Prep/Postp. In none of these 7 languages is the dominant type of adverbial subordinator a final subordinator. One of these seven languages, Bimoba (a Gur language), exhibits doubling for adverbial subordinators as well and is thus Prep/Postp&InitialSub/FinalSub. Four of these languages have true doubling for adposition type, but employ initial subordinators, at least as the dominant type, and are thus Prep/Postp&InitialSub: Moro (a Kordofanian language), Noni (a Bantoid language), Somali (an Eastern Cushitic language), and Yurok (a language of California related to Algonquian languages, within the group Algic). (29) and (30) illustrate these characteristics for Yurok and Noni respectively. The (a) examples illustrate the use of a preposition, the (b) examples the use of a postposition, and the (c) examples the use of a clause-initial subordinator.

(29) Yurok (Algic)[12]

a. kenik^{w}eċ-os ƙe-ʔyoc *so* hełku
steer-IMPER,2SG 2SG-boat *to* shore
Steer your boat to the shore. (Robins 1958: 145)

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11 In coding a language as involving true doubling, I do not intend to imply that a case could not be given for treating one or the other orders as basic; rather, I intend only to indicate that I did not see a clear basis for treating one order as dominant.

12 The words I treat as postpositions in Yurok are described by Robins (1958: 135) as 'adverbs' which 'take pronominal prefixes'. Since they apparently form a constituent with the noun they combine with, they seem to be postpositions by standard criteria.

b. ha?a·g *we-himar*
rock *3SG-under*
under the rock (Robins 1958: 135)

c. nek nimi ko?l nep-eḱ *?oɬkumi* nimi ciwey-eḱ
1SG NEG something eat-1SG *because* NEG hungry-1SG
I am not eating anything because I am not hungry. (Robins 1958: 148)

(30) Noni (Bantoid)[13]

a. bɔ́ fíí kèɪgɔ̀m *ɾ* kwɔɔ̀n
3pl receive plantains *from* woman
They are receiving plantains from the woman. (Hyman 1981: 80)

b. me nɔ́ɔ̀ n-ỳɽn wè *lɛ̌*
1SG PERF 1SG-see someone *OBJ*
I have seen someone. (Hyman 1981: 81)

c. bɔ́ nú mɛ̃ sɛ̌ *sékè* bɔ́ diekɽ̀n
3PL FUT finish *after* 3PL eat
They will finish after they eat. (Hyman 1981: 101)

The remaining two Prep&Postp languages employ adverbial subordinators which occur in clause-internal position, in both cases apparently clause-second position. In Wakhi (an Iranian language of Afghanistan and Pakistan), the primary position of the adverbial subordinator *ki* 'when, if' is described as rarely standing at the beginning of the clause and usually, though not always, preceding the verb, though the examples suggest it is typically in clause-second position (Lorimer 1958: 218). In O'odham (Papago), the adverbial subordinator meaning 'if' occurs in clause-second position along with auxiliary elements, as in (31).[14]

(31) O'odham (Papago)

pi a-n-t wo hii-X ma-t-p wo *ṣa* ǰuu-X
NEG MOOD-1SG-TNS FUT go-PERF SUB-TNS-COND FUT *if* rain-PERF
I won't go if it rains. (Saxton 1982: 133)

One type of language that is not attested is one that is Prep/Postp&FinalSub. Since the absence of this type fits in with the absence of Prep&FinalSub languages, we can formulate the implicational universal in (32), which is exceptionless in my data.

(32) If a language primarily employs clause-final adverbial subordinators, then, if it employs adpositions, those adpositions will be primarily postpositions.

The fact that languages which are Prep/Postp can be InitialSub but not FinalSub provides further evidence of the asymmetry between initial adverbial subordinators and final adverbial subordinators and is a further reflection of the preference for initial adverbial subordinators over final adverbial subordinators.

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13 The Noni postposition *le*™ in (30b) serves a number of different functions, among them marking the complement of certain verbs.

14 The suffix indicated as *-X* on the two verbs in (31) involves truncation of the verb stem; see Saxton 1982: 99.

A related, though weaker, tendency is found when we examine languages that have true doubling for the position of adverbial subordinators. My data contains seven instances of InitialSub/FinalSub languages. As noted above, one of these, Bimoba, also exhibits doubling with respect to adposition type. Of the remaining six languages, five are postpositional and one is prepositional. These languages are listed in (33) and (34).

(33) InitialSub/FinalSub&Postp
Adioukrou (Kwa, Niger-Congo)
Kanuri (Saharan, Nilo-Saharan)
Balawaia (Austronesian; Papua New Guinea)
Kawesqar (Chile)
Yagua (Peru)

(34) InitialSub/FinalSub&Prep
Ngizim (Chadic, Afro-Asiatic)

The examples in (35) illustrate an example of an InitialSub/FinalSub&Postp language, Yagua (spoken in Peru). (35a) illustrates the postpositional nature of the language, (35b) illustrates a clause-initial subordinator, and (35c) illustrates a clause-final subordinator.

(35) Yagua

a. ratyúúchu váturụy *jịsạạ*
1SG,talk woman.with.children *with*
I talked with the woman. (Payne 1990: 124)

b. *téta* vuryạ-ạ junúúrya vuryạ-ạ díiy tịịtájụ
unless 1PL,INCL-IRREAL look,INAN 1PL,INCL-IRREAL die all
Unless we look at it, we will all die. (Payne 1990: 81)

c. deerámiy sạạniy-yạạ sa-tịịsa *túúnu*
children shout-DISTR 3SG-play *while*
The children are shouting while they play (Payne 1990: 81)

The examples in (36) illustrate Ngizim (Chadic), the sole language in my data of the less common InitialSub/FinalSub&Prep type. (36a) illustrates the prepositional nature of Ngizim; (36b) illustrates a clause-initial subordinator; and (36c) illustrates a clause-final subordinator.[15]

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15 Although I classify Ngizim here as InitialSub/FinalSub, a case could be made for treating the initial subordinators as basic. There are a variety of other clear cases of initial subordinators, but not, as far as I am aware, other clear cases of final subordinators apart from the one illustrated in (36c). There is, however, a class of words that occur at the ends of many subordinate clauses that I assume here should be considered as adverbial subordinators, despite the fact that Schuh (1972: 331-336) explicitly argues that these words are not 'conjunctions' but 'determiners'. While his arguments may carry some weight diachronically, since two of the three words in question have uses with nouns, I suspect that these words have grammaticized to the point that they should be considered distinct from the homophonous determiners, much like the complementizer *that* in English. If these words are treated as clause-final subordinators, Ngizim does seem to be a case of true doubling in the position of adverbial subordinators, as I assume here.

(36) Ngizim[16]

a. ná ram laabař *ii* nən
1SG tell news *to* man
I told the news to the man. (Schuh 1972: 49)

b. *akuu* wà ji-n-aawa, dà gamši wa
after 1PL go-SUFF-1PL SBJNCTV,3 laugh 1PL
After we left, they laughed at us. (Schuh 1972: 356)

c. badiitu wana pəɗək-pəɗək *yaaye,* wana gaza-n-gara
begin work morning-morning *even.though* work remain-SUFF-3SG,FEM
afa aa gadaava
sun at middle
Even though he started working early in the morning, work remained at midday.
(Schuh 1972: 353)

While the difference between the number of InitialSub/FinalSub&Postp languages and the number of InitialSub/FinalSub&Prep is sufficiently small (5 versus 1) as to be within the range of accident, I will tentatively assume that it does indicate a real preference. What is its significance? The more frequent type here, InitialSub/FinalSub&Postp, involves the combination of the consistent pair FinalSub&Postp with the inconsistent pair InitialSub&Postp, which corresponds to a type we find elsewhere, while the less frequent type, InitialSub/FinalSub&Prep, involves the inconsistent pair FinalSub&Prep, which corresponds to a type we do not find. In other words, it indicates how Postp languages can have clause-initial adverbial subordinators, either as the dominant type or along with final subordinators, while it is less common to have prepositions co-occurring with final subordinators, even if the language has initial subordinators as well. The asymmetry found among doubling types thus provides further support for the notion that there is a dominance principle favouring clause-initial subordinators over clause-final subordinators.

4. Minimal Attachment

The evidence in the preceding section shows that the order of adverbial subordinator and clause exhibits an asymmetry similar to that found with the order of noun and relative clause: in both cases we find a correlation with the order of verb and object and in both cases one of the two inconsistent types is rare or unattested while the other is considerably more frequent. In both cases, the rare or unattested type is the one associated with VO languages, and as a result VO languages are more consistent in this respect than OV languages. Both cases can be described in terms of a dominance principle, that dominance principle favouring the order in which a clausal constituent follows a constituent consisting of a single word (noun in the case of relative clauses, adverbial subordinator in the case of adverbial clauses). Since the other asymmetries listed above in (6) are similar in this respect, they can all be seen as instances of the general descriptive generalization stated in (37).[17]

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16 Since these examples do not have interlinear glosses in Schuh (1972), the interlinear glossing is my own and may contain errors. Some of the forms may contain morphemes that I have not isolated.

17 Some approaches to relative clauses in English treat the relative clause as sister to an NP rather than to just the noun. I.e. there are two positions regarding the constituent structure of *the man that Mary saw*. On one approach, the determiner *the* combines with an Næ

(37) In constructions of the form X+Y where X is a single word and Y is a clausal constituent, there is a universal preference for the order X+Y rather than Y+X.

Given that the preference for NRel order over RelN order involves an instance of the generalization in (37), it seems likely that the explanation for the preference for NRel order will be whatever is the explanation for the generalization in (37). This provides a test for hypothesized explanations for the preference for NRel order: could that explanation be extended to other instances of the generalization in (37)? If an hypothesized explanation for the preference for NRel order could not be extended to the other instances of (37), we have reasons to question whether it is the right explanation. For in such a case, we would need some *other* explanation for the other preferences covered by the generalization in (37) and, ideally, that explanation would extend to the preference for NRel order and hence, the other hypothesized explanation for the preference in NRel order would be rendered unnecessary.

The question then is: can Hawkins' explanation in terms of Minimal Attachment for the preference for NRel order extend to the preference for adverbial subordinators? The answer is: not in any obvious fashion. The reason for this is that Hawkins' explanation in terms of Minimal Attachment for the preference for NRel order depends crucially on cases in which the relative clause occurs in the *middle* of the matrix clause: the incorrect minimal attachment involves initially treating the first part of a relative clause (and perhaps the entire relative clause) as part of the matrix clause, by attaching it into the partial structure already constructed for the matrix clause. Note that the minimal attachment problem presented by (5), repeated here, involves initially attaching *Mary* (and perhaps *loves*) into the same clause as *John*.

(5) John [Mary loves] man saw.

But adverbial clauses, while they may occasionally occur within other clauses (as in the sentence you are currently reading), apparently exhibit a relatively strong universal tendency (at least at the level of text frequency) to occur outside the matrix clause, either before or after the matrix clause and not internal to the matrix clause. Sentences like (38a) are apparently far less frequent crosslinguistically than sentences like (38b) or (38c).[18]

(38) a. John, after Mary arrived, ate dinner.
b. After Mary arrived, John ate dinner.
c. John ate dinner, after Mary arrived.

But only examples like (38a) (but without a clause-initial subordinator) present a Minimal Attachment problem. The crucial cases to consider are those of OV languages

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man that Mary saw and within the Næ the noun *man* combines the the relative clause *that Mary saw*. Under this assumption, *that Mary saw* is combining with a noun. On the alternative approach *the man that Mary saw* involves *the man* and *that Mary saw* as its immediate constituents. On this approach the relative clause is combining with an NP. The statement of the generalization in (37) assumes the first of these two approaches. However, it is possible that it should be restated in terms of the order of nonclausal versus clausal constituents. In other words, it may be enough that X in (37) be nonclausal rather than specifically a single word.

18 My conclusion that internal adverbial clauses as in (38a) are far less frequent crosslinguistically is not based on any systematic data of the sort that I have given in this paper for the position of adverbial subordinators, but just on my impressions after examining descriptions of such clauses in grammars of over 250 languages.

with clause-final adverbial subordinators, since the question is why such languages are less frequent than we might expect. Consider the case in which the adverbial clause occurs inside the main clause, illustrated by the schematic example in (39).

(39) John, [Mary arrived after], dinner ate.

Here there is the possibility of a Minimal Attachment problem: *Mary* might be interpreted as being in the same clause as *John.* Consider next the case in which the subordinate clause follows the main clause, as in (40).[19]

(40) John dinner ate, [Mary arrived after].

(40) does not seem to present any Minimal Attachment problem, particularly if the presence of the verb signals the end of the matrix clause. Consider finally the case in which the subordinate clause precedes the main clause, as in (41).

(41) [Mary arrived after], John dinner ate.

Here again there is no Minimal Attachment problem: since the adverbial clause occurs at the beginning of the sentence, there is no structure that parts of the adverbial clause can be attached to by mistake. In short, a Minimal Attachment problem arises at most with a class of adverbial clauses that are apparently rather infrequent.

One might try to argue that cases like (41), in which the adverbial clause precedes the matrix clause and in which the subordinator occurs at the end of the clause, present an attachment or analysis problem in that the adverbial clause will be initially misanalyzed as a main clause. However, this assumes that in parsing sentences, speakers of left-branching languages (in which structures like (41) occur) make decisions (or hypotheses) about whether material at the beginning of a sentence is part of the main clause or not. But such an approach seems unlikely. If that were the case, sentences in which the initial clause is not the main clause would tend to be avoided in OV languages. But in fact this is not the case. Sentence-initial position is a common position for all types of subordinate clauses in OV languages, and very often the preferred position. The frequency of such clauses can be explained if we posit a model in which speakers of such languages construct a parse of the clause, without making any assumptions as to whether it is the main clause or not (cf. Hawkins 1990, and particularly Frazier and Rayner 1988).[20]

The preference for clause-initial subordinators, shown most clearly by the number of OV languages that employ them, does not seem to be amenable to any explanation in terms of Minimal Attachment. And since this preference is an instance of the general phenomenon described in (37), Minimal Attachment cannot provide a general explanation

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19 The case represented by (40) is probably not a common one, both because adverbial clauses more often precede the matrix clause in OV languages and because those languages in which they follow the matrix clause may often employ clause-initial subordinators.

20 Hawkins' metric of EIC (Early Immediate Constituents) assumes that it is best for individuals parsing left-branching languages to delay as long as possible making decisions about how to attach incoming material. It remains a puzzle, however, why a number of OV languages with clause-initial subordinators often place adverbial clauses before the main clause. The effect is that people parsing such sentences *will* know quite early that the adverbial clause is not the main clause, and Hawkins' EIC predicts that such structures will be more difficult to parse than they would have been if the clause had not occurred with an initial subordinator or if the subordinate clause had followed the main clause.

for this phenomenon. Since the preference for NRel is another instance of this phenomenon, this casts doubt on the viability of Hawkins' appeal to Minimal Attachment as an explanation for the fact that NRel order is considerably more common crosslinguistically.

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