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The Syntax of Conditional Sentences

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Introductory Remarks

Although English has a number of different types of adverbial clauses, as is illustrated by such sentences as

(1) a. I will leave when you do.

b. I will go where you go.

c. I will leave before you do.

d. I will leave if you do.

e. I left because you did.

f. I left although I wasn't supposed to.

conditional clauses (see (1d)) have attracted the most attention from philosophers and linguists. Indeed, both linguists and philosophers have devoted whole conferences to their consideration. What is interesting about this from a linguistic perspective is that conditional clauses are not all that much more interesting linguistically than are any of the other types.[1] The reason for this special interest is surely that conditional sentences play a key role in reasoning, at least the sort of reasoning that interests philosophers.

Interestingly, not only have those who have studied conditonal sentences usually not discussed them in the context of other adverbial clauses, they have focused their attention almost exclusively on sentences like (1d) which employ the adverb _if_. Surely, however, conditional sentences in which _if_ is modified by _only_ and _even_, as in (2) and (3), are also of interest.

(2) I will leave only if you do.

(3) I will leave even if you do.

Moreover, there are totally ignored conditional constructions, very close in meaning to those just cited, which, like _if_-clauses, are adverbial in character:

(4) I will leave in the event that you do.

(5) I will leave only in the event that you do.

(6) I will leave even in the event that you do.

It is interesting to speculate on why sentences like (4)-(6) have been ignored. One possibility is the stylistic preference of logicians for the word *if*.[2] However, the main reason is surely that monomorphemic realizations of a category are typically perceived by native speakers (including philosophers) as its most basic representatives.[3]

In this paper, I present a syntactic analysis of a wide range of conditional sentences, which develops ideas first published in Geis (1973). A companion semantics and pragmatics for this analysis has been provided by Lycan (1984).[4] Since this study has been published, I will presume familiarity with it. What I propose to do here is provide the syntactic argumentation for this analysis, as well as the details of its formalization.

What one takes to be a conditional sentence will, I think, depend on whether or not one takes a syntactic or semantic perspective. Viewed semantically, a sentence like (7a) might be said to be conditional on the grounds that it has the "same" meaning as (7b), which clearly is conditional.

(7) a. Kiss my dog and you'll get fleas.

b. If you kiss my dog, you'll get fleas.

On the other hand, (7a) is not conditional in form, so it would be perfectly reasonable not to include this sentence in a study of conditional *sentences*, as opposed to conditonal *propositions*. Similarly, one might, following Stump (1981), take a sentence like (8) to be pertinent to a study of conditionals.

(8) For you to do that would be nice.

Certainly, (8) is conditional in meaning. However, again, there is little linguistic motivation for including such a sentence in the analysis of conditional *sentences*, though obviously it is relevant to the analysis of conditional *propositions*, i.e. of nonlinguistic mental sentences. I say this because (8), unlike (1d) and (2)-(6), is not conditional in form, and it is the possession of linguistic form that distinguishes real sentences from mental sentences (i. e. propositions). The fact that a sentence might be conditional in meaning does not qualify it for membership in the class of sentences containing conditional clauses. The reason is that we may look to extralinguistic semantic theories for an account of how it is that English has several different ways of expressing conditionality. As another example of this point, we might note that the fact that a pair of sentences like (9a) and (9b) might both express causality does not qualify (9a) as relevant to a study of causal clauses.

(9) a. John's leaving precipitated Bill's departure.

b. John left because Bill departed.

Too few linguists and philosphers seem to recognize that most putatively substantive claims about the relationship between syntax and semantics have been largely definitional in character. The once widely heralded claim (Harman 1972) that Deep Structure is Logical Form, is, perhaps the best example of this, but there are others.[5] To insist that sentences like (7a) and (8) must be brought into the picture in the attempt to describe the syntax of conditional sentences is, quite simply, to beg one of the most important questions of syntax: What is the contribution of syntax to the use and understanding of the sentences of our languages? The fact that native speakers of English "know" that (7a) and (7b) have the same meaning or "know" that (8) is conditional in meaning, taken alone, is not necessarily relevant to a linguistic analysis of conditional sentences, for speakers of English know more than just English. They, presumably, can do some elementary reasoning with sentences.[6]

If it is to be at all general, a linguistic description of English conditional sentences will want to account, at the very least, for such sentences as (1d) and (2)-(6), for these sentences are all conditional in form. It should perhaps also account for how these sentences are related to other adverbial clause constructions, such as those of (1), for these are also similar in structure. To my knowledge, the only comprehensive generative account of adverbial clauses in English is in Geis (1970a). However, Heinamaki (1974) and Larson (mss) have worked on temporal clauses, and Bresnan and Grimshaw (1978) on a similar construction.[7] I shall bring each of these studies into the picture as they become relevant. In Geis (1970a), conditional clauses were sharply distinguished from adverbial clauses introduced by <u>when</u>, <u>while</u>, and <u>where</u> and by <u>before</u>, <u>after</u>, <u>until</u>, and <u>since</u>. Clauses introduced by this latter array of words were said to be a species of relative clauses. I argued (Geis 1970a), in particular, that adverbial subordinate clauses introduced by the above connectives are derived transformationally from underlying syntactic structures in which the clauses introduced by these words are explicitly relative in character. According to this view, a sentence like (10) was said to be derived from the structure underlying (11) by a rule of Antecedent Deletion.

(10) I will leave at the time when you leave.

(11) I will leave when you leave.

Conditional clauses, for reasons to be identified later, were said not to be relative clauses, but, instead, to be a species of nominal complements. This line was continued in Geis (1973). What I shall argue now is that <u>if</u>-clauses like <u>when</u>-clauses are

themselves a species of relative clauses, as is implied by Lycan's semantics of conditionals. However, my present analysis, unlike the earlier transformational account of adverbial relative clauses, can be stated wholly in terms of English surface structures. On the analysis to be presented here, which is monostratal, I shall argue that a sentence like (12) has essentially the same sort of structure as (11).[8]

(12) I will leave if you leave.

The Adverbial Analysis of Conditionals

The Sentence Operator Version

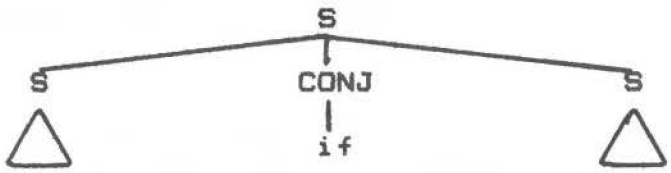
In the Propositional Calculus, a sentence having the form of (13) is usually assigned a representation like (14).

(13) If S1, then S2

(14) S1 ⊃ S2

where (14) is understood to be false if S1 is true and S2 is false and is otherwise true.[9] According to this analysis, the two clauses that make up a conditional sentence are coordinated semantically as they would be syntactically if <u>if</u> were a "true conjunction," to borrow a phrase from Jespersen (1961: V.4.344).[10] On this view, sentence (1d) would be given an analysis something like (15).

(15)



Interestingly enough, despite the long tradition associated with the standard truth functional analysis of <u>if</u>, there is no solid syntactic evidence whatever that supports the division of conditional sentences into two coordinate sentences, as in this analysis.[11] It might be argued that <u>if</u>...,<u>then</u>... is structurally parallel to <u>either</u>...<u>or</u>... and <u>both</u>...<u>and</u>.... The parallel is, however, an illusion. As pairs like (16) and (17) show, <u>then</u> need not occur for a conditional sentence to be grammatical, but of course, <u>and</u> and <u>or</u> are obligatory in compound sentences.

(16) If you leave, then I'll leave.

(17) If you leave, I'll leave.

One cannot say

(18) *Both John left, Bill left.

(19) *Either John left, Bill left.

It is if, not then that is the more fundamental constituent of conditional sentences.

Though logicians normally cite conditional sentences in the form of (16) or (17), a syntactician is likely to take a sentence like (20), to be the more "natural," for in (20), the if-clause is in "normal" adverbial position.

(20) I will leave if you leave.

Note that the two clauses of (20) are the reverse of what they are in (13), (16) and (17). In the latter sentences the condition precedes the consequence, but in (20), the reverse is true. As noted, I take post-verbal conditional clauses to be in "normal" word order for conditional sentences. Talmy (1976) makes the universal claim in connection with causal constructions that causes are subordinated to effects in the languages of the world, as in (1e) and (1f), repeated here as (21) and (22), respectively.

(21) I left because you did.

(22) I left although you did.

This is to say that languages (other than formal languages, of course) do not have adverbial clause constructions in which the consequent is subordinated to the antecedent, from which it would appear to follow that (20) is more basic than (13), (16), and (17). Moreover, not all languages even have the capacity to place conditional clauses in sentence-initial position, as in (16) and (17).[12]

The fact that a sentence like (20) might be more natural than (13), (16), and (17) does not, by itself, upend the binary sentence operator analysis. One need only define a reverse horseshoe, with appropriately revised truth-conditions, and reverse the two clauses. On this revision, the if of (15) would correspond exactly to the reversed horseshoe. However, the fact that if-clauses can occur both sentence-initially and post-verbally is itself rather good evidence that if-clauses are adverbial. Simple and complex time adverbials both have this freedom of occurrence, for instance:

(23) a. I will leave at noon.

b. At noon, I will leave.

(24) a. I'll leave when you leave.

b. When you leave, I'll leave.

Data like (23) and (24) strike at the heart of the coordinating conjunction analysis of conditionals, for patterns like these do not obtain in the case of coordinate structures:

(25) a. Joe will leave and Mary will stay.

b. *And Mary will stay, Joe will leave.

(26) a. Joe will leave but Mary will stay.

b. *But Mary will stay, Joe will leave.

We have quite clear evidence that if-clauses are adverbial and are subordinate to main clauses, not coordinated with them.

There is solid syntactico-semantic evidence that post-verbal occurrences of if-clauses (see (20)) are more basic than preposed if-clauses (see (16) and (17)). Observe that sentences (27)-(29) have essentially the same interpretation.[13]

(27) I think that I will leave if you leave.

(28) I think that if you leave, (then) I'll leave.

(29) If you leave, (then) I think I'll leave.

It is clear that (29) is not to be interpreted as stating that there is a conditonal relationship between the hearer's leaving and the speaker's thinking about leaving, contra its surface form. Instead, the speaker is saying that he thinks that the hearer's leaving will lead to his leaving. In the standard transformational idiom, we would account for this by saying that the if-clause of (29) is put there by an extraction rule, namely Adverb Preposing (recall (23) and (24)). Even in monostratal theories of syntax a sentence like (29) must be treated as the "marked" form.

Observe that when if-clauses are preposed, as in (28) and (29), a second conditional adverbial cannot occur in postverbal position:

(30) *I think that if you leave, I'll leave in that event.

(31) *If you leave, then I think I'll leave in that event.

Thus, we must have some way to exclude a conditional adverbial from post-verbal adverbial position, if an if-clause occurs clause- or sentence-initially. Within GPSG, this is achieved, of course, via the slash-category notation.[14]

(32) S ----> ADV[2] S/ADV[2] ($9)

Rule (32) stipulates that if an S begins with an adverb phrase then the S it is sister to must have an adverb phrase gap. Given rule (32), we can account for both (30) and (31), as well as (28) and (29).

The adverb preposing data reveals the hopelessness of the standard analysis of the structure of conditional sentences in logic texts on syntactic grounds, and, as a result of this failure, it is hardly surprising that the analysis fails semantically as well. Adverbial constructions normally involve quantification over something--times, places, events, etc, as is implicit in the relative clause treatment I shall be giving later.[15] Such a fact is quite telling against the truth functional account of <u>if</u>.

The failure of the standard logical treatment of conditonals is further revealed by the fact that <u>if</u>-clauses can be modified by <u>only</u> and <u>even</u>. Consider:

(33) a. I will leave only if you do.

b. I will leave even if you do.

(34) a. John works only when his back feels good.

b. John works even when his back hurts.

(35) a. *John works hard only and Bill works hard.

b. *John works hard even and Bill works hard.

As (34) indicates, <u>only</u> and <u>even</u> are quite comfortable modifying adverbial <u>when</u>-clauses. Note, though, that they do not modify nominal <u>when</u>-clauses:

(36) a. He asked me yesterday when I would leave.

b. *He asked me yesterday only when I would leave.

We have here the clearest possible evidence that <u>if</u>-clauses of the sort we are interested in are adverbial, for note that nominal <u>if</u>-clauses aren't modifiable by <u>only</u> either:[16]

(37) a. He asked me yesterday if I would leave.

b. *He asked me yesterday only if I would leave.

Certainly the view that <u>if</u> might be a conjunction is falsified by (33)-(35).

Very clear evidence that conditional clauses, when they occur postverbally, are constituents of verb phrases and are therefore adverbials is provided by data involving VP Deletion and <u>Do So</u>.[17] Observe that the place-holders, <u><></u> and <u>do so</u> of the

following sentences, are interpreted as referring back to the underlined verb phrases of these sentences:

(38) a. I will leave at noon and Joe will <> too.

b. I will leave at noon and Joe will do so too.

(39) a. I will leave under certain circumstances and Joe will <> too.

b. I will leave under certain circumstances and Joe will do so too.

(40) a. I will leave when you do and Joe will <> too.

b. I will leave when you do and Joe will do so too.

(41) a. I will leave if you do and Joe will <> too.

b. I will leave if you do and Joe will do so too.

The most conservative interpretation of these data is that the place-holders in these sentences refer back to constituents, and thus that temporal and conditonal constituents of the left conjuncts of these sentences are constituents of verb phrases. Given this and the fact that these constituents are not noun phrases, all that is left for them to be is adverbials (= prepositional phrases, adverb clauses, or adverbs.)

The data we have considered so far involving preposed conditional clauses, modification by only and even and verb phrase ellipsis phenomena provides very strong evidence against the view that the conditional and main clauses of conditional sentences are coordinate and for the view that conditonal phrases and clauses, like temporal phrases and clauses, are adverbial constructions. These arguments carry over to the other types of conditional clauses identified earlier. Thus, if-clauses modified by only and even prepose as do complex prepositional phrases like in the event that S, whether or not they are modified by only and even. VP-Deletion and Do so tests show that all of these constructions are or can be constituents of predicates.

There also exists quite direct evidence that conditonal clauses are adverbial in character, evidence that closely links if-clauses to in the event that S constructions on the one hand and to adverbial relative clauses on the other. Consider the following pronominalization data:

(42) a. I will leave if you leave, and Joe will leave then too.

b. I will leave *if* you leave, and Joe will leave *in that event* too.

(43) a. I will leave *when* you leave, and Joe will leave *then* too.

b. I will leave *when* you leave, and Joe will leave *at that time* too.

In these sentences, we have clauses whose anaphoric reflexes are adverbials, either simple conditional and temporal adverbs or more complex prepositional phrases. In this respect, *if*-clauses and *when*-clauses act like explicit prepositonal phrases. Compare (44) and (45) with (42) and (43), respectively.

(44) a. I will leave *in the event that* you leave and Joe will leave *then* too.

b. I will leave *in the event that* you leave and Joe will leave *in that event* too.

(45) a. I will leave *at the time that* you leave and Joe will leave *then* too.

b. I will leave *at the time that* you leave and Joe will leave *at that time* too.

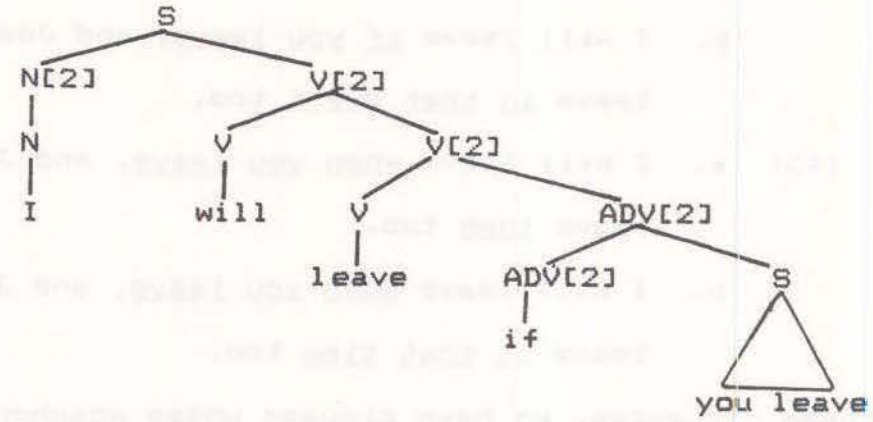
We would not want to conclude from these data that *if*-clauses and *when*-clauses modify explicit prepositonal phrases in underlying structure, as I once did in the fabulous days of Generative Semantics, but we are entitled to conclude from these data that *if*-clauses and *when*-clauses are adverbials.

There is an adverbial analysis of *if*-clauses that has a good deal of initial plausibility, namely one in which *if* is treated as a kind of sentence operator that turns ordinary clauses into adverbial clauses. On this view, *if* would be treated as in

(46) ADV[2] -----> ADV[+cond, +oper] S

According to this analysis, the structure of nonpreposed conditionals would look something like this:

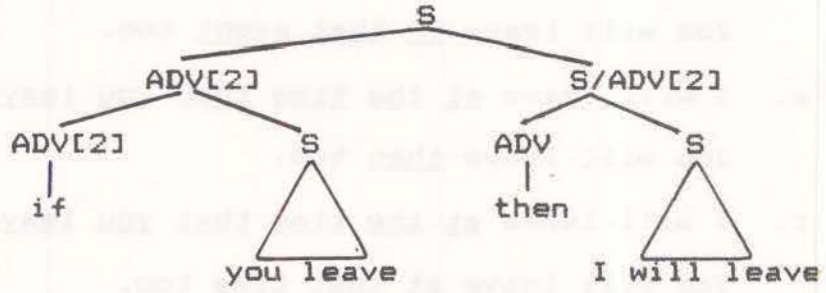
(47)



This analysis is appears to be consistent with at least some of the facts we have so far considered, and it provides a not at all implausible surface structure. However, there are troubling facts, not the least of which is the fact that <u>then</u> pops up in cases of preposed adverbials. Given the assumptions of (47), we would want, I think, to say that a sentence like (48) has a structure like (49).

(48) If you leave, then I will leave?

(49)



Though structure (49) is eminently reasonable, I believe that it is incorrect. There are two features of (49) that are somewhat problematic. There is nothing (explicit or implicit) in such an analysis that explains why <u>then</u> might pop up in conditional sentences. So it is potentially deficient on explanatory grounds. Moreover, there is evidence that <u>if</u> is a constituent of the clauses it introduces, contra (49).

The Relative Clause Analysis

The hypothesis that conditional clauses are adverbial in character is well-motivated, and the structures we have assigned to normal and preposed <u>if</u>-clauses are credible representations of the surface organization of such sentences. What is missing is a defense of the particulars of these analyses and some sort of explanation of the position of such structures in the grammar of

the language as a whole.

Throughout our discussion of *if*-clauses, we have found that *if*-clauses and *when*-clauses parallel each other exactly: both prepose; both accept the modifiers *only* and *even*; both are consituents of verb phrases when they occur postverbally; and both pronominalize the same way, to the point of sharing the homophonous adverbial proadverb *then*. This latter point is worth pursuing further. There are hosts of languages that employ temporal expressions exclusively to express conditionality. Even English, which has a plenitude of conditional expressions, allows its speakers to express conditionality using temporal expressions. The sentence

(50) When exposed to the air, many substances oxidize.

is used primarily to express a conditional, not a temporal relationship, though, of course, it is consistent with a temporal interpretation. The reason that temporal expressions can be used to express conditional relationships is that the most important individuating characteristic of events, the entities quantified over in conditional sentences according to Lycan and me, is the date of those events.

The parallel between *if*-clauses and *when*-clauses is a very deep one. As Chomsky (1957) noted years ago, if two strings of consituents conjoin they are normally not only syntactic constituents, but are also constituents of the same type. Consider:

(51) *John was awakened by John and by accident.

(52) *John knows that I ate an orange and what I know.

If Chomsky is correct, as the preponderance of evidence over the years would suggest, then we must assume that *if*-clauses and *when*-clauses are constituents of the same type and that *if* and *when* are as well.[18]

(53) I will consider leaving if I'm asked to and when I'm asked to.

(54) I will consider leaving if and when I'm asked to do so.

Greg Stump has suggested to me that *if and when* may be an idiom, and thus that data such as these may mean very little. Against this, I would say five things. First, conjunctions of *if*-clauses and *when*-clauses are not themselves idioms, which is important since sentences containing *if and when* merely carry the

conjuction reduction a bit further. Second, if and when and when and if both occur, which is to say that the structure isn't frozen. Third, conjunction facts such as these extend to other not dissimilar phenomena (e.g. When and where did he leave?) which are surely not idioms. Fourth, the meaning of if and when is compositional, which is uncharacteristic of idioms, which is to say that each word makes a contribution to the meaning of the phrase and to the sentence as a whole. Fifth, other temporal and conditional adverbs conjoin. Note, for instance, that until-clauses and unless-clauses conjoin and until and unless conjoin.[19]

(55) I won't leave unless you leave and until you leave.

(56) I won't leave unless and until you leave.

There is clearly much too much that is systematic about these conjunction facts to support Stump's suggestion that we are dealing with idioms.

In light of the above, it is tempting to suggest that adverbial if-clauses, like adverbial when-clauses, are instances of the same construction and that if is in the same lexical class with when. In Geis (1970a), I argued that adverbial when-clauses are a species of relative clauses, and that when is a relative proadverb.[20] This argumentation is accepted by Larson (mss), who, working in a transformational framework, provides a somewhat different formalization.[21]

Of the various observations in Geis (1970a), the most important were that when-clauses can be structurally ambiguous, that when-clases are islands, and that when is a constituent of the clauses it introduces. As we shall see, if-clauses and when-clauses are similar, but not identical, in regard to these three properties.

Let me begin with the worst fact. Compare (57) and (58).

(57) I will leave when you say you'll go.

(58) I will leave at the time when you say you'll go.

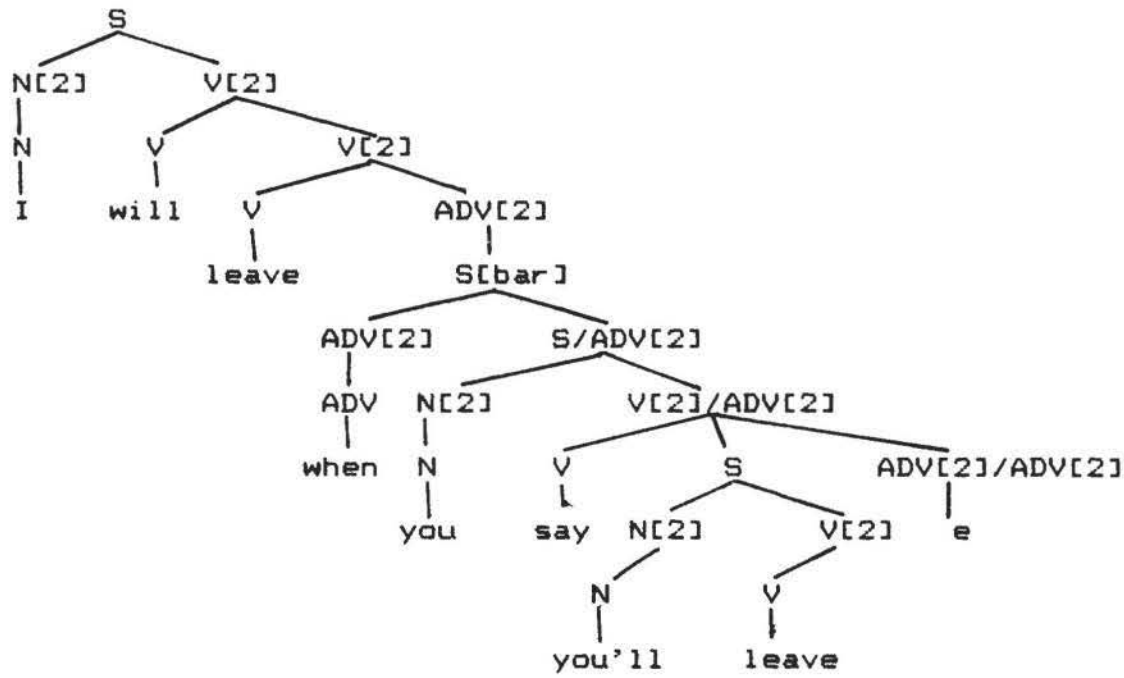
Sentences (57) and (58) are ambiguous between a reading in which the speaker promises to leave when the hearer performs a speech act and one in which the speaker promises to time his departure with that of the hearer. In order to account for this syntactically, we must suppose that (57) and (58) are assigned two syntactic analyses which, in one way or another, say that when participates in two dependency relationships in these sentences.[22] Larson (mss) takes the transformational line of Geis (1970a) and claims that when is extracted from the main clause of you say you'll leave on one derivation and from the subordinate clause on the other. I shall take the monostratal line of GPSG and say that when-clauses are special cases of the construction

type

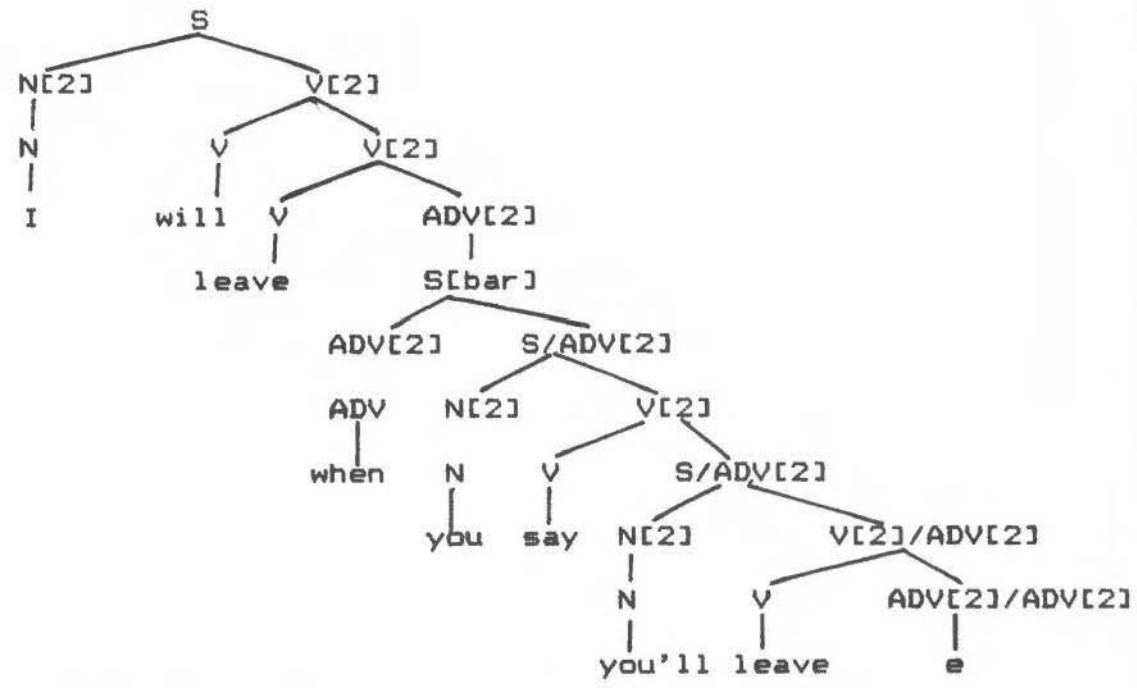
(59) S --------> α S/α ($6)

On this view (57) has a structure like (60) on one interpretation and (61) on the other.

(60)



(61)



Contra the claim that (if)-clauses are structurally similar to when-clauses, that is that if-clauses are a species of relative clause, if-clauses are not ambiguous.[23] Consider (62) and (63):

(61) I will leave if you say you'll leave.

(62) I will leave in any circumstance in which you say you'll leave.

Although (62) is a bit long, and complex, I believe that it is ambiguous in just the way that (58) is.[24] But (61) is not ambiguous in the way that (57) is. Despite the otherwise overwhelming evidence supporting the thesis that if-clauses and when-clauses are grammatical sibilings this failure of the relative clause analysis cannot be disregarded. However, it is possible to attach too much significance to the nonambiguity of conditional clauses. In Geis (1970a), I presented evidence that while-clauses are themselves covert relative clauses despite the fact that they also are not ambiguous. Sentence (63) does not seem to have a reading in which while links the two occurrences of study.[25]

(63) I studied while Mary believed I should be studying.

However, I find sentence (64) to be quite acceptable, from which it follows that extraction is to some (albeit small) degree possible.

(64) I studied while I was supposed to.

What we are dealing with here is degrees of extractability.

Though most theoreticians resolutely ignore such messy phenomena, they exist and may say more about the nature of language than do neater, theoretically more compliant facts.[28] Moreover, there exists overwhelming semantic evidence (see Geis 1973 and Lycan 1984) that conditional clauses make covert reference to events, which is to say that sentences like (65) and (66) have essentially the same interpretations.

(65) I will leave if you leave.

(66) I will leave in any circumstance in which you leave.

The most natural syntax for a construction that connects clauses semantically via quantification over events is to say that the clauses are connected syntactically in the way relativization connects clauses. Moreover, not only are _if_-clauses unambiguous in the desired way, but so also are clauses appended to _in the event that_, which also need an analysis. Compare (67) with (61) and (62).

(67) I will leave in the event that you say

you'll leave.

In previous work (Geis 1973), I related a sentence like (61) to (67), largely because neither is ambiguous and assumed that clauses subordinated to _in the event that_ are like (nonrelative) clauses subordinated to _the fact that_, i. e. are noun complements. However, I do not believe that it is possible to give a coherent semantics for constructions like (67) given this sort of syntactic analysis. I would argue that one should adopt Lycan's semantics for (67), no less than (61), i. e. take the line that clauses embedded as adjuncts to _in the event that_ are themselves relative clauses. But if this is the right move, then the failure of _if_-clauses to mirror _when_-clauses in regard to the question of ambiguity is not fatal. Nevertheless, it must be dealt with, of course, as I shall do shortly.

The second fact supporting the thesis that _when_-clauses are relative clauses is that elements cannot be extracted out of _when_-clauses. Consider

(68) a. *Who did the boy leave town when Mary kissed <>.

b. *Who did the boy leave town at the time when

Mary kissed <>.

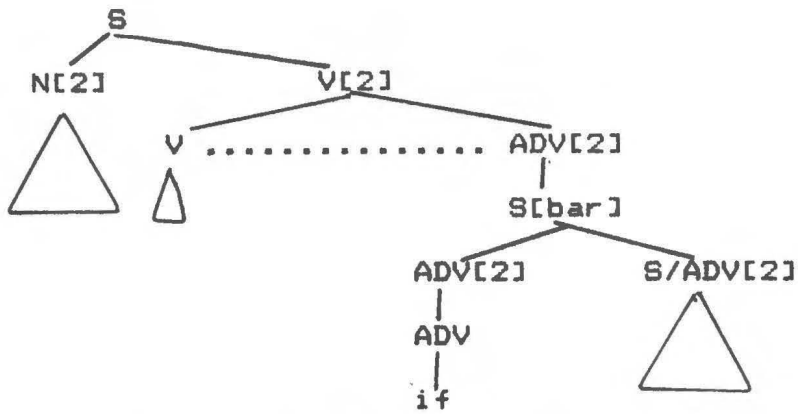
At present, there are a number of ways this sort of fact can be accounted for. I derived sentences like (68a) from sentences like (68b) in Geis (1970a) and appealed to Ross' (1967) Complex Noun Phrase Constraint to account for (68a). Though not accepting the deletion analysis, Larson (mss) gives the more recent analog of my treatment by appealing to Chomsky's (1973) Subjacency

Constraint. Within GPSG (see Gazdar (1982) for details), one would normally invoke the principle that no constituent can be assigned two slashed categories, as would be required for (68a), one for who and another for when. Not surprisingly, nothing can be extracted from if-clauses, as can be seen from

(69) *Who will the boy kiss Mary if Joe kisses <>.

In order to account for this, conditional sentences must be assigned a structure like (70) in order to invoke the condition ruling out dual slashes.

(70)



However, as we shall shortly see, this option is not available to us.

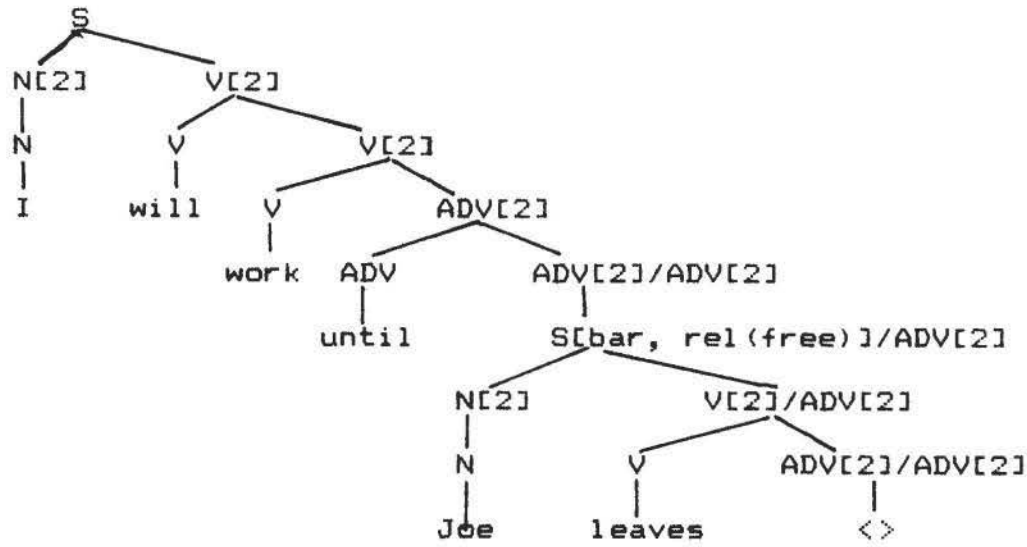
The third argument in favor of the relative clause treatment of when-clauses is that when is a constituent of the clause it introduces, after the manner of a relative proadverb. Compare (71) and (72).

(71) I will work until Joe leaves and Harry will work until then/that too.

(72) *I will leave when Joe leaves and Harry will leave when then/that too.

Manifestly (see Geis 1970a for details) the correct treatment of (71) and (72) is to say that when, but not until, is a consituent of the clauses it introduces, as in trees (60) and (61). On the other hand, the left conjunct of a sentence like (71) should be assigned a structure like (73).

(73)



Clearly, <u>if</u> functions just like <u>when</u>, for (74) is ungrammatical on the intended interpretation.

(74) *I will leave if Joe leaves and Harry will leave if then/that too.

This fact, considered in the light of the fact that <u>then</u> can replace <u>if</u>-constructions as a whole, represents compelling evidence that <u>if</u> is a constituent of the clauses it introduces, which is to say that it is a relative proadverb. Given that <u>unless</u> conjoins with <u>until</u>, I believe that we would want to assign a tree like (73) to sentences containing <u>unless</u>, where <u>unless</u> occurs in place of <u>until</u>.

As we have seen, two of the three arguments for the relative clause treatment of <u>when</u>-clauses carry over to <u>if</u>-clauses. However, the most compelling argument derives from the fact that <u>then</u> can occur in initial position in the (grammatically) main clause of a conditional sentence if there is a sentence-initial <u>if</u>-clause. This is, I submit, a fact of over-riding syntactic importance, and when properly interpreted provides an explanation for the nonambiguity of conditional clauses. In my speech, this is a virtually unprecedented construction, but it is quite like the corelative construction that has largely departed the language. I find the following sentences to be increasingly grammatical as one moves down the list.

(75) a. ***Who steals my purse, him I won't like.

b. **Where he goes, there I'll go.

c. *When he leaves, then I'll leave.

d. If he leaves, then I'll leave.

Now consider (76).

(76) a. **Who steals my purse, I won't like.

b. *Where he goes, I'll go.

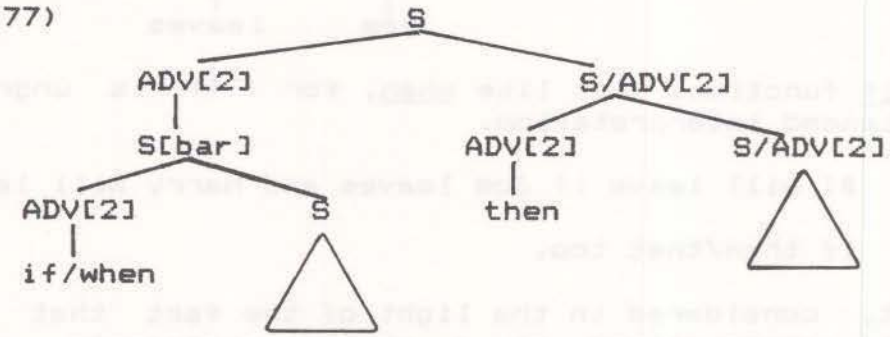
c. When he leaves, I'll leave.

d. If he leaves, I'll leave.

I suggest that the correlative construction is going out of the language, with (75d) being its remaining trace.

I would argue that sentences like (75c) and (75d) have the following syntactic structure:[27]

(77)



Quite surprisingly, correlative when-clauses, unlike conventional (i. e. post-verbal) adverbial when-clauses, are unambiguous. Although correlatives are not fully acceptable to me, I feel reasonably confident in the judgement that the when-clauses of (78) and (79), unlike that of (80), are unambiguous.

(78) ?When you say you'll phone, then I'll leave.

(79) When you say you'll phone, I'll leave.

(80) I'll leave when you say you'll phone.

Perhaps more persuasive will be (81)-(83), which demonstrate that there is no extraction reading for preposed when-clauses of either sort.

(81) *When you said you'll phone, then I'll leave.

(82) *When you said you'll phone, I'll leave.

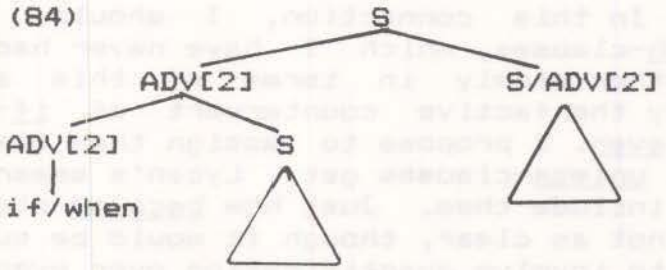
(83) I'll leave when you said you'll phone.

Thus, if we associate conditional sentences with sentences containing correlative clauses, the relative clause analysis of conditional sentences escapes unscathed from my nemesis

counterexample.

Then nonambiguity of coorelative then-clauses is accounted for by the above analysis. Note that the S which is immediately dominated by the S[bar] of (77) is not slashed, which can be exploited by the semantics to force a "highest" clause analysis of modification by when and if. Neither can "reach" more deeply into this S than to the highest verb. I propose that preposed when-clauses and if-clauses such as those in (76c) and (76d) that occur with main clauses not preceded by then will also occur in structures like (84).

(84)



In my view, the then that fronts main clauses when if-clauses are preposed, is the same word that occurs in discourses such as the following:

(85) A: I'll leave at noon.

B: Then I'll leave at three.

An interesting consequence of this is, since then clearly has an interpretation in (85), is that it should also contribute to the meaning of a sentence like (75d). Interestingly, just as my analysis predicts, Davis (mss) has pointed out that pairs like (86) and (87) do not have the same interpretation.

(86) If you open the refrigerator, it won't explode.

(87) If you open the refrigerator, then it won't explode.

As Davis notes, (86) is true of ordinary refrigerators, while (87) is true only of refrigerators rigged to explode unless opened. I see this as especially strong evidence of the semantic benefits of the present syntactic analysis.

Conclusion

I have provided quite a number of arguments in support of an adverbial analysis of conditional clauses in general and of an adverbial relative clause analysis in particular. In a sense, this comes down to arguing that if is a constituent of the

clauses it introduces. On the other hand, unless is treated as constituent of main clauses, like its morphologically similar temporal cousin until. These may seem to be rather small potatoes to those not versed in monostratal syntax, but this is an impression worth correcting. Whatever one's theory of syntax, one must get the surface structures of sentences right to get much of anything else right. Even transformational theories are houses of cards built on surface structure piles even though they may seem to be grander.

Perhaps the most important feature of the present analysis is that it brings conditional clauses into line with other types of adverbial clauses. In this connection, I should, perhaps, point out that although-clauses, which I have never had much to say about, fall out rather nicely in terms of this analysis. What they are is simply the factive counterpart of if-clauses, which are modified by even. I propose to assign them essentially the same analysis as unless-clauses get. Lycan's semantics can easily be expanded to include them. Just how because-clauses fit into the program is not as clear, though it would be surprising if they were not also to involve quantification over events.

This work was once regarded as quite abstract, for it involved postulating antecedents for adverbial relative clauses introduced by when, while, and where and antecedents and relative adverbs for clauses introduced by before, after, until, and since. Interestingly, the most essential syntactic features of this analysis are accomodated quite easily within the monostratal framework, GPSG, resulting in a description which is no less insightful syntactically than the transformational treatment. As a result, I believe the analysis must be all the more persuasive, since it is syntactically more conservative.

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1. Interestingly, traditional grammarians, who do not seem to have been much influenced by logicians, did not single out conditional clauses as being of radically greater importance than other types of adverb clauses.

2. This preference of logicians, who are linguistically naive in their own way, is itself of interest, as is the fact that they virtually always cite conditional sentences with the if-clause preposed. See the example sentences cited in Harper, Stalnaker, and Pearce (1981) for confirmation of these points.

3. See Clark and Clark (1977) for an interesting discussion of this point.

4. Though our research is done quite separately, Lycan and I are collaborating on the development of a general theory of conditional sentences. This effort emerged out of a course Lycan

and I once jointly taught at The Ohio State University. We were examining Geis (1973), a paper in which I provided a syntactic analysis of sentences like (1d) and (2)-(6) and argued for the view that a correct semantic analysis of conditional sentences must employ quantification over events or circumstances, a semantical point of view that has come to be quite fashionable (Barwise and Perry 1983). This semantic analysis led Lycan to give the essentials of his very much more sophisticated semantic treatment, which in turn inspired me to redo significantly my syntactic treatment.

5. The reason I say this equation is question begging is that it was believed correct at that time to use semantic evidence (e.g. coocurrence data) in determining the Deep Structure of a sentence. Obviously, use of semantic data in the study of Deep Structures of sentences will have as an inevitable result that Deep Structures be Logical Forms.

6. I am not recanting the views expressed in Geis (1984) and Fox and Geis (1984) about the limitations of people's logical capacities. But the view that people do not control the validity-invalidity distinction does not require us to believe that people are not able to recognize (at least roughly) some synonymy relationships.

7. Bresnan and Grimshaw (1978) made no reference to Geis (1970a), which is perhaps due to the fact that MIT disertations are hard to come by even for those who teach at MIT.

8. I shall show below that the minimalist syntactic theory, Generalized Phrase Structure Grammar (GPSG), proposed originally by Gazdar (1981), and pursued in Gazdar (1982), Gazdar and Pullum (1982), and other papers provides sufficient descriptive apparatus to state this analysis, despite its admirably restrictive character.

9. This analysis, taken as an analysis of the meaning of English <u>if</u>...,<u>then</u>..., has very little to recommend it. The connective <u>if</u>...,<u>then</u>... is, of course, not truth functional. This was shown in Geis (1973), is argued by Gazdar (1979) in a more general way, and is further argued by Lycan (1984).

10. Interestingly, Jespersen (1961: V.4.344f), who recognized that many of the so-called "subordinating conjunctions" (e.g. the connectives of (1) above) were morphologically similar to such things as relative pronouns and prepositions, called <u>if</u> a "conjunction proper." Whether or not he meant to be advocating that <u>if</u> is therefore grammatically just like <u>and</u> and <u>or</u> in syntax is not clear.

11. Though I know of no one who has seriously proposed that the clauses that make up conditional sentences are coordinate in character, it, is nevertheless, not a straw man position. In her doctoral thesis, Heinamaki (1974) proposed that the temporal

connectives, when, before, and until, etc. are coordinating conjuncitons, and this is a great deal less plausible than that if is a coordinating conjunction. Her arguments against Geis(1970a) are unimpressive, to say the least.

12. I am indebted to Arnold Zwicky for this observation.

13. These very important examples are due to Lakoff (1972).

14. Reference to "($n)," where "n" is a numeral, is to a rule number in the Fragment following the text.

15. Arguments of a linguistic character (i.e. arguments that are not wholly semantic) that conditional adverbials generally and if-clauses in particular make covert reference to events are given in Geis (1973). The Lycan (1984) paper contains a rather more sophisticated version of this analysis, with additional motivation.

16. The analysis I give of the syntax of if-clauses can be extended to nominal occurrences of them. See rules ($5) and ($7). I treat indirect questions as [free] [int]errogatives (= [int(free)]). The only conditional [cond] proadverb [pro] that can occur in free interrogatives is unmodified if.

17. These names reflect the transformationalist idiom within which they were first discussed. Abandonment of this paradigm does not, of course, require that we abandon all of what can be learned from data once believed to support it.

18. Arnold Zwicky has pointed out to me that one can also conjoin when and before despite the fact that the former is a relative proadverb and the latter is a preposition:

(i) I will leave when or before you leave.

Because of this, I propose to treat prepositions as adverbs. In the Fragment additional motivation is given.

19. I take this as evidence that unless and until are in the same lexical class, which is the treatment of the Fragment.

20. To those who would object to the view that if is a relative proadverb on morphophonological grounds, I would say two things. First, how and who differ phonetically from what, when, where, and why, but this does not stop us from saying that they, like the others, are interrogative pronouns. Second, in hosts of languages, the word used to signal conditionality is homophonous with the word used to signal "simultaneity" (and in English, as noted above, temporal words are sometimes used to signal conditional meanings.)

21. Larson's work does not include conditional sentences, so I do not know what his stand on the issues just raised would be.

22. See Stump (1981) for a semantic account of these facts.

23. When lecturing to an introductory class on English syntax taught by Edward Klima in 1964, I proposed the relative clause analysis of conditional sentences, noting this counterexample. I decided later that this sufficed to wreck the analysis. It was only on seeing Lycan's impressive reformalization of my sketchy semantics for conditionals, that I returned to this analysis. This semantic treatment clearly wants a relative clause syntax.

24. Lycan takes a paraphrase like (62) to be especially perspicuous in regard to the meanings of conditional sentences. I agree with him, and we are working toward a book-length treatment of conditionals that reconciles his intuitions with the syntactic analysis presented here.

25. See Stump (1981) and Larson (mss) for alternative interpretations of these facts.

26. As Sapir (1921) noted, "all grammars leak," and theories must be devised in which leaks are intrinsic features of grammatical descriptions rather than the embarrassments they usually are.

27. The slash category on the sister to the mother of <u>then</u> is not introduced by the rule that gives us <u>then</u>, but by Adverb Preposing ($9), the rule that positions the <u>when</u>-clause in initial position.

A Fragment

In this section, I provide an explicit chracterization of the syntax of adverbial clauses generally and conditional clauses in particular. In the process, I more fully develop the relationship between *if*-clauses and other types of conditional clauses, as well as other types of adverbial clauses, providing in the process a sketch of the motivation for the details of the analysis. I assume (a bit loosely) the framework of Gazdar and Pullum (1982), and Gazdar's (1982) treatment of relative clauses and of free relatives of the sort Bresnan and Grimshaw (1978) were concerned with.

I. Phrase Structure Rules

(\$1) ADV[2] ----> ADV N[2]

a. at noon, in the garden, etc.

I am treating prepositions as adverbs because some can stand alone as apparent adverbs *I haven't done that before* and can be thought of as intransitive adverbs. Those that require objects can be thought of as transitive adverbs. This approach to prepositions goes back to Jespersen (1961 II.1.15).

(\$2) N[2] ----> N[2] S[bar, +rel]

a. the place where Joe lives. (with \$6)

b. at the time at which Joe left. (with \$1 & \$6)

In Gazdar and Pullum (1982) a given feature is sometimes treated as binary and sometimes treated as having other features as values. I shall exploit this by taking [rel(free)] to entail [+rel]. Though a bit equivocal, this view of features is clearly a coherent one. I shall treat [rel(free)] as the marked option for [rel]. So relatives with heads are unmarked relatives and those without heads are marked.

(\$3) X[2] ----> ADV[+quant] X[2]

a. Only John, only on Tuesday, even on Tuesday

This rule allows for the quantificational adverbs *only* and *even*, which I am treating as adverbials that can only modify phrasal categories (X[2]). One of the values of [+quant] is [+neg] and the other [-neg], features that play a role in triggering inversion, as will be shown below.

(\$4) ADV[2] ----> ADV ADV[2]

a. *up* at the barn, *until* then

b. only until then (with $3)

This rule allows for adverbial objects for certain prepositions, most of which can also occur with noun phrase objects. See Geis (1970a, 1970b) for relevant argumentation and the lexicon below for lexical details.

($5) X[2] ----> S[bar, free]

COND: [+pre] ∈ X[2] ⊃ [-slash] ∈ S[bar, free]

a. I will leave when you leave

b. I will go from where you are to where he is.

c. John lives near where Bill lives.

d. This is where he went.

e. When you leave, I'll leave.

f. If you leave, I'll leave.

g. I wonder where he went.

h. I wonder if he went.

i. I wonder whether or not he went.

j. I will leave whether or not he went.

This rule allows for clausal noun phrases and adverbial phrases, which are either relative or interrogative in character. I am treating embedded free relatives (a-f) and interrogatives (g-j) as instances of the class of "free" noun phrases and interrogatives. As I am using the feature, [free] is a value of [rel] and of [int], the marked value in each case. It is tempting to treat (j) as a free interrogative adverbial clause because of its similarity to (i). The condition on this rule is to insure that preposed free relatives are not slashed, i. e. are not ambiguous.

($6) S[bar] ----> (ADV[2, +wh]) S/ADV[2]

COND: [+free] ∈ S[bar] ⊃ [+pro] ∈ ADV[2]

If the mother node has the feature [+free], then the daughter node ADV[2] has the feature [+pro], a feature I use to force a monolexical pronoun for free relatives. It does not correctly get ($5h), for whether or not is obviously not monomorphemic, though, of course, whether is.

a. John lives where Joe is working. (with $5)

b. John studied until Joe left. (with $4 & $5)

c. John lives at the place where Joe lives. (with $1 and $2).

d. John lives at the place at which Joe lives. (with $1 and $2).

e. I left by the time he arrived. (with $1 and $2)

f. I will leave in any circumstance in which you leave. (with $1 and $2)

As stated this rule gets all sorts of relative clauses, including ordinary relatives with heads (c, d, e, f) and those without (a, b), which have, as "complementizers" a monolexical pronoun or proadverb (a, c), prepositional phrase (d, f), or nothing at all (b, e). This rule gets only "true" relative conditional clauses, like ($6f). To get _if_-clauses or _in the event that S_ constructions with this rule would incorrectly predict that they can be ambiguous. See the next rule.

($7) S[bar, +cond] ----> (ADV[2, +pro]) S

a. I will leave if you leave.

b. I will leave unless you leave. (with $4 and $5)

c. I won't leave unless'f you ask me to. (with $4 and $5, see also the lexical information on _unless_)

d. I will leave in the event that you leave. (with $1 and $2)

This rule gets us conditional clauses. Because the S node to the right of the arrow is not slashed, conditional clauses cannot be ambiguous. If the pronoun is [+wh] we get _if_; if [-wh], we get _that_. This distinction is required in order to get _in the event that S_ conditionals.

($8) S/ADV[2, +cond, -wh] ----> ADV[2, +pro, -wh] S

COND: [+neg] ∈ ADV[2] ⊃ [+inv] ∈ S

a. If you leave, then I'll leave.

b. If you leave, only then will I leave.

This is is the rule that gets _then_ into the main clauses of sentences with preposed _if_-clauses, which is the last remaining

instance of the correlative construction most dialects. The rule is therefore ad hoc in the desired way, a synchronically explanatory theory of *if* being a theoretical pipedream. We must build into this rule the provision that if *then* is modified by *only*, its sister S must be marked as undergoing inversion. As I see it, the COND of this rule is a condition on any rule introducing ADV[2] and S as sisters, including the next rule.

($9) S ----> ADV[2, +pre] S/ADV[2]

a. At noon, John left.

b. If you leave, I'll leave.

c. Only if you leave will I leave.

d. ?Only if you leave then will I leave.

This is adverb preposing, of course. It is subject to the condition on the previous rule. If we wish to block ($9d), we will need to say that if ADV[2] is [α mod], then S/ADV[2] is [−α mod], where [quant] is a value of [+mod]. The feature [+pre] ([+pre] = 'preposed') is there to guarantee that preposed free relatives are not ambiguous--see Rule ($5).

II. Lexical entries

A. at, on, in, up, until, *unless = +Rule ($1)

B. only, even = +Rule ($3)

C. up, until, unless, although = +Rule ($4)

D. near, in front of = +Rule ($4)

COND: [+prep] ICW [+rel] ⊃ [+adv, +wh] ∈ [+rel]

The stipulation--for place prepositions, but not time prepositions--is that if *near* and *in front of* occur in construction with (ICW) a relative clause, the clause must have an overt relative proadverb. I use the notion "in construction with" here for perspicuity, and do not mean to be making the claim that this notion is required.

E. until, since, before, after, unless

COND: [+prep] ICW [+rel] ⊃ [−wh] ∈ [+rel]

The condition--for time and conditional prepositions, but not place prepositions--guarantees that relative clauses introduced by these words will not have an overt relative proadverb. For those who can say *I won't leave unless'f you ask me to*, as I can, *unless* is not in this list. I know of no analysis of conditionals that can cope at all with this datum.

F. if, when, where = [adv(pro(wh))]

G. then = [adv(pro(-wh))]

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