

ON THE ODD SYNTAX OF DOMAIN ADVERBS

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Sentence-modifying Domain adverbs in English (e.g. *politically* and *surgically*) show several unusual syntactic features. They may occur to the left of inverted subject and auxiliary, rarely if ever appear between subject and main verb, and occur inside the VP, in positions otherwise reserved for verb-modifying adverbs. In keeping with the general approach of Jackendoff (1972) and Ernst (1984), this paper proposes that this be handled by means of unrestricted base generation of adverbs, and an interpretation rule for sentential Domain adverbs which applies anywhere in the sentence, as opposed to the rule for other sentential adverbs which excluded adverbs under VP and to the left of inverted Aux and NP. This approach is shown to be preferable to more traditional, syntactic accounts in a number of ways.

1. Domain adverbs are those like *musically*, *artistically*, *economically*, or *mathematically* which define domains of study, nature, thought, social organization, and so on. Typically, they appear in sentences like (1),

(1) Socially, Mel is quite a success.

where we are saying that Mel's success is in the social domain, although he is perhaps not a success in professional or intellectual terms. They can also be involved in metaphorizing a sentence, as in (2):

(2) Politically, he's a midget.

These are both sentence-modifying occurrences. While we will not focus on predicate-modifying cases such as those in (3),

(3) The alien communicated linguistically, instead of using telepathy.
these have been little noticed in the literature, yet are important for an overall account of adverbs.

In what follows I will examine the sentential occurrences of Domain adverbs, showing how their syntax differs from other adverbs which otherwise are the same in many ways, and propose a way to account for these differences. I will first sketch the overall analysis of the relevant classes of adverbs in Ernst (1984); then, in section 2, I will describe how Domain adverbs are different. In section 3, I propose an analysis which does account for this data. Finally, I show how certain other approaches to these differences are unacceptable.

In recent years much of the research on English adverbs has invoked a basic distinction between adverbs which modify predicates (sometimes called "VP-adverbs") and those which modify sentences ("S-adverbs" or "sentential adverbs"). In a very large number of cases, the same adverb can fulfil both functions. Thus in (4)-(6), the adverbs in the (a) sentences modify their predicates, while those in the (b) sentences are sentential:

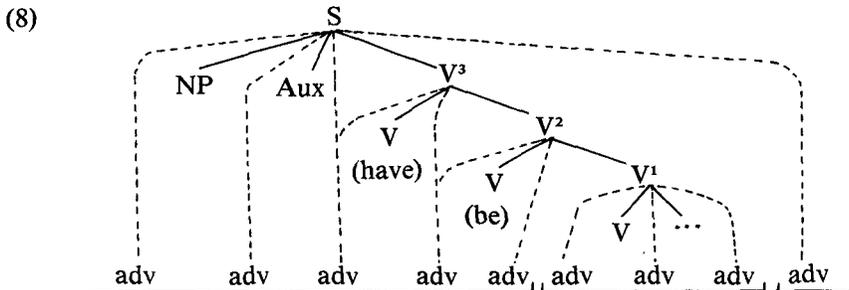
- (4) a. The Senator was talking foolishly to reporters.
 b. Foolishly, the Senator was talking to reporters.
- (5) a. The attempt on the enemy stronghold ended tragically.
 b. Tragically, the doors were sealed and no one could escape.
- (6) a. Harry kept pushing his cause obstinately.
 b. Obstinate, Harry kept pushing his cause.

The adverbs in (4)-(6) (a) have usually been called manner adverbs. In Ernst (1984), however, I argued that the traditional category "manner adverb" is not a coherent lexical category; instead, I claim that it is a collection of predicate-modifying occurrences of a number of diverse lexical classes. *Foolishly* in (4), for example, is an Agent-Oriented adverb. Its meaning can be formulated roughly as in (7):

- (7) The Agent can be judged foolish because of α .

Here, α is a variable which can be replaced by either of two values, corresponding to predicates and sentences. Thus for (4a), the contribution of the adverb is "the Senator can be judged foolish because of something about his talking to reporters" (perhaps the unwise things he was saying to them), and in (4b) it is "the Senator can be judged foolish because the Senator was talking to reporters," that is, he was foolish to talk to reporters. Using this variable, cases like (4)-(6), which have frequently forced scholars to treat the (a) and (b) sentences as having "homonymous" adverbs (e.g. Jackendoff 1972, McConnell-Ginet 1982), can be treated as having the same adverb.

One of the interesting features about this dual possibility of modification is that it corresponds very closely to the syntax. That is, when an adverb modifies the predicate, it almost always occurs within V^1 , and when it modifies the sentence, it occurs outside V^1 . (Here, I follow the system used by Akmajian, Steele, and Wasow (1979), where V^1 corresponds to the traditional VP without auxiliary verbs. The V 's under V^3 and V^2 dominate *have* and *be*, respectively, if present. For convenience, in what follows, "VP" is used interchangeably with " V^1 ." This is shown schematically in (8), where dotted lines show possible dominance relationships for adverbs:



All positions to the left of the main verb are sentence-modifying, except for the one immediately next to the verb, which can also be predicate-modifying, as in (9):

(9) She cleverly answered each question.

(9) can either mean "She was clever to answer each question" or "she answered each question in a clever manner." Positions to the right of the verb are verb-modifying, unless the adverb is sentence-final and marked-off by "comma-intonation."¹ So in (10), (a) has a VP-adverb, and (b) has a sentential occurrence:

- (10) a. She answered each question cleverly.
 b. She answered each question, cleverly.

These patterns are handled by generating adverbs in all their possible positions² and allowing semantic interpretation rules to assign an interpretation. Predicate modifiers are accounted for by a rule which operates within V¹ only; sentential adverbs are assigned interpretations in all other positions. Cases of sentences that are unacceptable due to adverbs in the wrong position (e.g. (11)),

(11) *They tightly would hold the frammis.

are (usually) handled by saying that such sentences have no possible interpretation. That is, in a case like (11), the rule necessary for interpreting *tightly* only applies in V¹, and *tightly* must be dominated by S; therefore no reading is possible and the sentence is unacceptable.

2. Domain adverbs conform to the semantic pattern shown in (4)-(7). (1)-(3) above are examples; compare also (12), where S-modifying *economically* in (a) indicates that planning not being in vogue (i.e. the proposition expressed by the sentence minus the adverb) is valid in the economic domain, although perhaps not in the political domain.

- (12) a. Economically, long-range planning has not been in vogue.
 b. The President vowed not to intervene economically.

In (b), on the other hand, *economically* is a predicate modifier, indicating the manner of intervention.

However, Domain adverbs do not conform to the syntactic patterns of other

¹ I assume that all sentence-final adverbs with comma-intonation are derived via a postposing transformation which moves any adverb under S or Vⁿ to final position and imposes comma-intonation. This is not the only approach to postverbal adverbs, however. For example, one could base-generate postverbal adverbs under V² or V³, and impose comma-intonation anywhere outside of V¹. In this case one would still have to move adverbs out of V¹ to derive sentences like *She also plays the piano, quite competently*.

² Except one: see foot note 1.

adverbs, in the following ways. First, as sentential modifiers, they may occur sentence-finally *without* ‘‘comma-intonation’’:

(13) Long-range planning has not been in vogue economically.

Thus it is possible for a sentence-final Domain adverb to be completely ambiguous between S- and VP-readings, as in (14):

(14) We’ve solved many of our problems financially.

On the sentential reading, (14) can be paraphrased by the two sentences in (15):

- (15) a. Financially, we’ve solved many of our problems.
b. We’ve solved many of our financial problems.

The predicate-modifying reading, however, is that we used financial means to solve certain (possibly nonfinancial) problems. Thus we could say, retaining this reading, the sentence in (16):

(16) We’ve solved many of our political problems financially.

(e.g. by buying votes). Note that if we add *political* to (15a), the sentence is unacceptable (see (17)),

(17) ??Financially, we’ve solved many of our political problems.

and in (15a) *financially* cannot have the predicate-modifying interpretation that it can have in (14).

Second, and more radical, is the fact that sentence-modifying adverbs can occur deep inside the VP, even between verb and predicate modifiers. Examine (18)-(21):

(18) They won him over intellectually quite quickly.

(19) He has distanced himself socially from his former boss, but still has to see him professionally once in a while.

(20) She has changed her ideas linguistically more than I expected.

(21) The king united them politically through military means.

In (18), *intellectually* does not necessarily refer to the means of winning him over (the predicate-modifying reading) but can indicate that he was won over as far as intellectual matters are concerned. (18) thus has a paraphrase with *intellectually* in initial position:

(22) Intellectually, they won him over quite quickly.

Quite quickly is a standard, verb-modifying manner adverbial, dominated by VP, and we must therefore conclude that *intellectually* is also dominated by VP. There are parallel arguments for (19)-(21), where the phrases *from his*

former boss, *more than I expected*, and *through military means*, respectively, are in the VP, indicating the three Domain adverbs are also.³ Yet paraphrases with these adverbs in initial position, among other criteria, indicate that they are sentential modifiers semantically.

Third, Domain adverbs can occur to the left of the inverted Aux and subject in questions. In (23), related to (19) above,

(23) Socially, has he distanced himself from his former boss?

we are asking whether he has put distance between himself and his former boss as far as social activities are concerned, perhaps in contrast to professional activities. In (24)-(25) we have similar cases:

(24) Politically, what are the implications of that speech?

(25) Diachronically, how does this finding affect your analysis?

Most other sentential adverbs cannot occur in this position:

(26) *Foolishly, was the Senator talking to reporters?

(27) *Tragically, did the attempt on the enemy stronghold fail?

(28) *Possibly, what are the implications of that speech?

Fourth, unlike other adverbs, sentential Domain adverbs rarely if ever occur between the subject NP and the main verb. Thus (29)-(30) are unacceptable with *economically* and *financially* in the positions indicated, in contrast to, say, *obviously* and *probably* in (31)-(32):

(29) *The President's strategy (economically) has (economically) been a failure.

(30) *It (financially) would (financially) have (financially) meant a bonanza for the firm.

(31) The President's strategy (obviously) has (obviously) been a failure.

(32) It (probably) would (probably) have (probably) meant a bonanza for the firm.

³ In (19), *distance (oneself)* subcategorizes for the preposition *from*; thus the PP *from his former boss* should be at the lowest level of VP-structure, along with *himself*, and so is the Domain adverb *socially*. Note that the diagram in (8) conceals the fact that there may be several levels of V below V', which corresponds to V in many systems. In any case, the Domain adverbs may occur at the lowest level.

All of (29)-(32) are acceptable with the adverb in initial position.⁴

3.1. How are we to account for these differences? The solution which I will finally adopt makes use of differing semantic interpretation rules for Domain adverbs on one hand, and adverbs like *tragically*, *obviously*, and *foolishly* on the other. Before going on to this analysis, however, we should first examine the claim that in the case of the biggest anomaly—that of sentential adverbs occurring inside the VP—we are in fact dealing with sentence-modifiers. After all, in sentences like (18)-(19) it may be tempting to see the adverb modifying the verb: the winning-over done in the intellectual field, and the distancing done in matters of social life as opposed to professional life. On this view, the two readings of *financially* in (14), and the phrases *politically* and *through military means* in (21) (which parallel the two readings in (14)) are all predicate modifiers. At the very least, this seems to simplify the syntactic account.

However, there are several reasons to reject this possibility. First of all, it does not really simplify things syntactically, since we must account for the paraphrases with the sentence-initial adverbs, such as (15a) for (14), and (22) for (18). Are we to say that these are predicate-modifiers as well? It is true that, in rare cases, predicate-modifiers occur sentence-initially, as in (33):

(33) Unobtrusively, a few servants hovered in the background.

One might attempt to treat the adverbs in (18)-(21) as VP-adverbs and thus subject to the same distributional patterns as (e.g.) *unobtrusively*. But if so, it will be difficult to explain why cases like (33) are so rare compared to the normal, postverbal occurrences, while for Domain adverbs the pattern is reversed: it is the sentence-initial position that is favored. Also, such VP-adverbs never occur to the left of inverted Aux and subject in questions, as these Domain adverbs do, such as in (23).

In other words, Domain adverbs do not really conform to the syntactic pattern of VP adverbs. Semantically, it should first be noted that many of the standard, formal tests for sentence-operator status do not seem to apply to Domain adverbs. For example, we can argue that *clearly* in (34) is a sentence-modifier because it takes *probably* in its scope (i.e. “it is clear that it is probable that they won’t finish on time”), and we already know that *probably* is sen-

⁴ There is a fifth position that Domain adverbs can occasionally take, which is off-limits to most other adverbs: as the first or last element of NP’s:

- (i) [Investors] see this country as politically the world’s stablest, and economically the most promising as well. (*World Press Review*, Sept. 1984, p. 31)
- (ii) A viable solution economically is not necessarily a good one socially.
- (iii) He’s too much of a schemer politically (to be given the benefit of the doubt).

Given the NP-initial node motivated in chapter 3 of Ernst (1984), these cases can be handled straightforwardly with the appropriate lexical marking on Domain adverbs. The rule which moves *indeed*, *only*, and other adverbs to NP-final position will handle cases like (ii) and (iii).

tential:⁵

(34) Clearly, they probably won't finish on time.

But in (35),

(35) a. Clearly, the new production is a failure musically.

b. Musically, the new production is clearly a failure.

none of the possible paraphrases, such as (36), give a clear indication of what the relative scope of *clear(ly)* and *musical(ly)* actually is.

(36) a. It is clear that the new production is a failure from a musical point of view.

b. As far as music goes, it is clear that the new production is a failure.

Nevertheless, even if we have no ironclad proof of their sentence-modifying status, many scholars have suggested treating them as sentential. Bellert (1977), for example, likens their function to that of a restrictive universal quantifier, so that, for example, (37) could be paraphrased as (38):

(37) Linguistically, this example is interesting.

(38) For all cases x such that x is linguistic, (the case of) this example is interesting.

McConnell-Ginet (1982) also suggests that Domain adverbs may be treated as some sort of variable-binding operator. In addition, there are many examples such as (39), where it is much less tempting to try to see *psychologically* as a predicate-modifier,

(39) Psychologically, the order of the day was Behaviorism.

if anything, we would want to say that the subject NP *the order of the day* is the entity characterized as psychological.

The examples of Domain adverbs in VP do not differ in meaning from the paraphrases with the adverb in sentence-initial position, so if we assume that the latter are sentential modifiers, the adverbs in VP should be also.⁶

⁵ See Thomason and Stalnaker (1973).

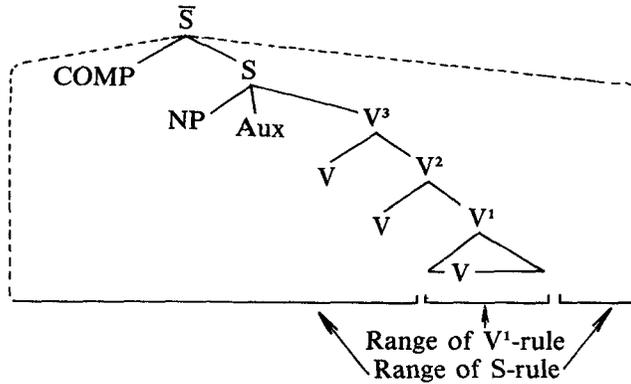
⁶ It is still very tempting to see these cases as involving modification of elements smaller than a sentence. The difficulty in taking such a theoretical tack, however, is that *which* element is to be modified varies widely from case to case. In (18)-(21) it seems to be the verb, in (37) the adjective, in (1) a noun. In (39), it would have to be the subject NP, and in (i), it is a PP deep inside an embedded clause:

(i) Technologically, they have preferred for their colonies to remain in the know.

What seems to be going on here is not that basic semantic rules link Domain adverbs to the elements they seem to modify—this would be hopelessly complex—but that Domain adverbs take the whole sentence in their scope, and then “focus” on the contextually appropriate element, similar to the way that *even*, *only*, and negation can focus on elements/smaller than the semantic unit they operate on immediately.

3.2. Given that cases of Domain adverbs within VP are sentential modifiers semantically, how do we account for this fact? Remember the two interpretation rules mentioned above, one operating in V^1 and accounting for the predicate-modifying readings, and the other rule assigning sentential readings to adverbs dominated by higher nodes. (For convenience, I will call these the V^1 -rule and the S-rule, respectively.) This is represented schematically in (40), an expanded version of (8):

(40)



Clearly this does not account for cases like (18)-(21), since no S-reading is allowed under V^1 . Simply extending the S-rule's range into V^1 will not do, since we would then incorrectly claim that S-adverbs like *apparently* or *unfortunately* could appear in V^1 (without being set off as a parenthetical), as in (41):

(41) *Earl has aged { *apparently*
 unfortunately } quite a bit.

As indicated above, it is in part the inapplicability of the S-rule in such a position that accounts for the unacceptability of (41) and similar sentences.

What I propose here is that we have a special interpretation rule for sentential Domain adverbs, which I will call the S-Domain Rule, that applies anywhere. That is, it combines the range of the V^1 -rule and the S-rule, so that both sentence-initial cases and those in the VP, such as *socially* in (23) and (19), respectively, are given a sentential reading. The V^1 -rule still applies, accounting for the ambiguity in examples like (14),

(14) We've solved many of our problems financially.

and the normal cases of predicate-modifying Domain adverbs, e.g. (3) and (42)-(43):

(42) The Congresswoman wasn't thinking politically when she made that remark.

(43) The doctors cured his disease nutritionally (instead of surgically).

Of course, other semantic and pragmatic factors will still rule out many sentences in these cases, accounting for the fact that ambiguous sentences with VP- and S-readings are fairly rare (see Ernst (1984) for elaboration).

The ability of Domain adverbs to occur in questions like (23), in contrast to the adverbs in (26)-(29), which cannot, may be ascribed to the fact that these latter adverbs are used to make assertions, as Bellert (1977) shows. Thus, they may not occur with the indicator of a question—that is, the inverted subject and auxiliary—in their scope. On the other hand, Domain adverbs do not make such assertions, instead providing a sort of viewpoint from which the sentence can be evaluated.

Thus we can account for two of the three oddities mentioned earlier. The first two, S-final position without pause and occurrence deep inside the VP, are accounted for by the special interpretation rule covering, essentially, the whole sentence. The third is handled by a lexical difference between Domain adverbs and other classes of adverbs.

At this point, I have no really satisfactory solution for the fourth point, namely the non-occurrence of sentential Domain adverbs between subject and main verb. The problem can be handled by standard technical machinery, for example by subcategorizing the adverbs so that they will not appear in the forbidden positions. One would hope that a more revealing solution can be found, however. Fred Householder (personal communication) has suggested that sentential Domain adverbs are topics, and thus the positions between subject and verb are inappropriate, but this does not account for the acceptability of positions to the right of the verb. I therefore tentatively adopt the subcategorization solution.

4. There are a number of more syntactically-based approaches to the problem of Domain adverb distribution that might seem attractive. Suppose, for example, that we were to generate sentences like (20) by moving the adverb from a base position at the head of the sentence (see (44)),

(44) Linguistically, she has changed her ideas more than I expected.

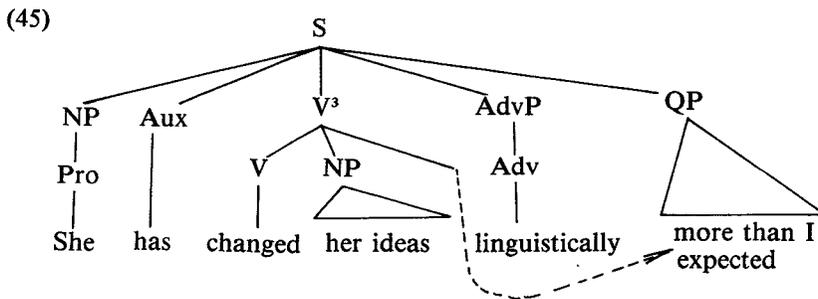
→(20) She has changed her ideas linguistically more than I expected.

or, alternatively, moved it inward from a sentence-final base position. This approach is empirically adequate, but suffers from two theoretical drawbacks. First, it would require abandoning the claim that (with one exception⁷) VP- and S-adverbs do not move. In the system proposed here, all adverbs are base-generated, so we avoid using all transformations of the type needed here. Since

⁷The exception is sentence-final position with comma-intonation, as indicated in foot note 1. This is a motivated exception, since the movement rule applies not only to adverbs, but more generally to phrases like *I think, if you know what I mean, on Tuesday*, etc.

interpretation rules are required anyway, we lose little by expanding them slightly at the expense of a transformation. Second, this would require deep structure semantic interpretation, with its attendant problems (see, for example, Chomsky 1971, Jackendoff 1972). With interpretation rules applying to base-generated adverbs, these problems do not arise.⁸

A similar approach, which avoids the necessity of moving adverbs, would be to move various elements out of the VP to positions dominated by S. On this account, *linguistically* in (20) would start out in—and stay in—post-V³ position under S; *more than I expected* would be moved rightward to be a sister of *linguistically*, as in (45):



This rule, however, would have to be able to move a large variety of disparate VP elements, and only when one class of adverbs, Domain adverbs, is present. Moreover, it has no independent evidence; similar rules require that the moved element be “heavy” or an “afterthought” (i.e. cases with comma intonation), which is not the case here. This is thus a very poor candidate for a transformational rule.⁹

In conclusion, we have seen that sentential Domain adverbs differ from other, similar sentential adverbs in that they cannot occur between the subject and the main verb, they cannot occur to the left of inverted subject and Aux, and

⁸ Note that even in the case of the general movement rule mentioned in foot note 7 and the minor rules moving adverbs to NP-final and AP-final positions, the interpretation rules may apply *after* movement, which is not the case for the putative transformation illustrated in (44)/(20).

⁹ This rule might be revived for use with some form of Baltin’s (1982) theory of “landing sites”. This notion is rather attractive for treating Domain adverb distribution, since it accounts well for modifiers which occur on the left or right *periphery* of a phrasal category; using this proposal, we could neatly exclude sentential Domain adverbs from the positions between subject and verb, and predict both initial and final positions in \bar{S} , S, NP, AP, and VP. Then, cases like (18)-(21) could be treated with the VP-element postposing rule. However, besides the problems inherent in this movement rule, Baltin’s theory does less well with other adverb classes, as indicated in Ernst (1984: 287-288), since they may occur among the auxiliaries, and apparently do not occur with correct interpretations on the right periphery of V² or V³.

they can occur in the VP (including sentence-finally without comma intonation). The first difference is handled via subcategorization, and the latter two by creating a separate interpretation rule for sentence-modifying Domain adverbs which has a wider range of application than the rule for other adverbs. Finally, we have shown that certain other approaches all suffer from syntactic or semantic defects that the present analysis avoids.

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