

A Syntax for Adverbs

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In his 1972 monograph *Semantic Interpretation in Generative Grammar*, Ray Jackendoff begins the chapter on adverbs saying, “the adverb is perhaps the least studied and most maligned part of speech, . . . maltreated beyond the call of duty”. Twenty-five years later the analysis of adverbs continues to receive relatively little attention in the linguistic literature (notable exceptions include Ernst 1984, Alexiadou 1994, and Cinque 1998). This is surprising given that adverb placement is extremely widely used as a probe on syntactic structure. Such diagnostics, it has been pointed out however, can be misleading and/or inaccurate, precisely because a comprehensive theory of adverb position is not available (Iatridou 1990, Bobaljik and Jonas 1996, Collins and Thráinsson 1996). This paper is a contribution towards addressing this situation. Using English adverb placement and a conservative conception of English clause structure, it develops a theory of adverb syntax.

The paper is organized as follows. Section 1 proposes a structural description for the distribution S- and VP-adverbs in English, following observations in Jackendoff 1972. Section 2 provides a theoretical basis for the proposal. The fundamental idea is that a given adverb class is structurally licensed by one or more heads in a definable domain. Where in a structure a particular adverb may appear is thus sharply restricted. The analysis accounts for the distribution of Jackendoff’s adverb classes as well as additional classes in English. Section 3 closes with an indication of some further issues for the proposal.

1 Adverb Distribution in English

In this section, I offer a description of the distribution of two major classes of English adverbs. Section 1.1 presents observations from Jackendoff’s (1972) seminal work on adverb placement in English finite clauses. Section 1.2 adapts these generalizations to more recent syntactic structures and proposes an explicit structural distribution. Section 1.3 offers empirical support.

1.1 Adverb Placement: Jackendoff 1972

Jackendoff 1972 develops a classification of adverbs in English based on their positional distribution in tensed clauses. It recognizes two syntactic classes of adverbs corresponding to the traditional distinction between predicate modifiers and propositional modifiers. In Jackendoff's syntactic analysis, the former are attached at the VP level while the latter modify S. For this reason, the two classes are called VP-ADVERBS and S-ADVERBS. Examples of each are given in (1) and (2), respectively (Jackendoff's (3.12) and (3.7)).

- (1) Stanley *completely/easily/handily/quickly* ate his Wheaties.
- (2) Horatio *evidently/probably/certainly/apparently* lost his mind.

The distribution that Jackendoff offers for the two adverb classes is illustrated in (3) through (9). S-adverbs may appear clause-initially, (3); immediately following the subject, (4); or to the immediate right of a modal or finite auxiliary verb, (5).

- (3) a. *Probably* Sam has been called.
b. *Often* Max is climbing the walls of the garden.
- (4) a. Sam *probably* has been called.
b. Max *often* is climbing the walls of the garden.
c. George *apparently* ate the leftovers.
- (5) a. Sam has *probably* been called.
b. George will *certainly* show up late.
c. They were *undoubtedly* ruined by the hurricane.

They may not appear to the right of a non-finite auxiliary, (6).¹

- (6) a. *Sam has been *probably* called.
b. *My phone is being *possibly* bugged.

VP-adverbs, in contrast, may appear clause-finally, in (7), or to the left of the main verb, in (8). This latter position is independent of what might precede the adverb: any combination of modal and/or auxiliaries is permissible, as illustrated.

- (7) a. George won't be reading that book *quickly*.
b. The mouse went through the maze *easily*.

- (8) a. George won't be *quickly* reading that book.
- b. The mouse *easily* went through the maze.
- c. They could have been *safely* rescued.

VP-adverbs are not permitted to the left of modals or auxiliaries, (9).²

- (9) a. *George won't *quickly* be reading that book.
- b. *George *quickly* won't be reading that book.
- c. *They could *safely* have been rescued.

These positional distributions are summarized in (10) and (11).

- (10) *Positional Distribution of S-Adverbs*
 - a. clause-initial
 - b. immediately following the subject
 - c. to the immediate right of a modal or finite auxiliary
- (11) *Positional Distribution of VP-Adverbs*
 - a. clause-final
 - b. to the immediate left of the main verb

Particularly in light of footnotes 1 and 2, I note that these distributions are idealizations. They are nevertheless useful and otherwise realistic ones and I will adopt them for what follows. A proposal to translate these descriptions into a concrete syntactic analysis is conspicuously absent in the recent linguistic literature. I develop one in the following section.

1.2 A Syntactic Proposal

To develop an analysis of adverb placement, two questions must be answered, 1) how are adverbs integrated into a syntactic structure (subsection 1.2.1) and 2) where are they integrated (subsection 1.2.2). I propose that adverbs are realized in adjunction positions within a conservative clause structure that has a unitary IP dominating one or more VPs.

1.2.1 how adverbs are realized

Two options for how adverbs are realized in a structure are that they are in adjoined positions (Pollock 1989, Iatridou 1990, Johnson 1991, Bowers 1993 and others) or that they are in specifier positions (Jackendoff 1981, Alexiadou 1994, Kayne 1994, Cinque 1998 and references therein). This issue is too large to be decided here; I will simply offer two observations that support the adjunction approach that I will adopt. First, adjunction accounts for the possibility of adverb iteration. In general, multiple adverbs may 'pile up' hierarchically at a single location. Examples are given in (12), several from

Ernst 1984. Regardless of the exact structural position of these adverbs, several in one sentence are easily accommodated with adjunction.

- (12) a. Hazel *probably often* goes there.
 b. He *apparently never merely* skims papers but rather reads each one carefully.
 c. The burglars *evidently probably* broke in the back door.
 d. 'He *gladly always* took people up for rides.' (*SF Chronicle*, 4/12/96)
 e. Kim has *now most likely really only* been keeping up with the soap operas.

With adverbs in specifier positions, a distinct projection for each adverb would be required since a projection has exactly one specifier. Consequently, numerous empty heads would necessarily be present and a highly articulated clause structure would be required in order to accommodate the examples in (12). While this would not be impossible, such projections should be accompanied by some English-internal motivation, which is absent.

Second, a characteristic of adjunction is the unordered nature of multiple adjuncts. Although Cinque 1998 has argued in great detail that adverbs within the two classes under investigation are rigidly ordered, this is not always so. When the semantics are appropriate, certain pairs of adverbs may be freely ordered:

- (13) a. The rebels have $\left\{ \begin{array}{l} \text{now perhaps} \\ \text{perhaps now} \end{array} \right\}$ surrendered.
 b. John will $\left\{ \begin{array}{l} \text{probably wisely} \\ \text{wisely probably} \end{array} \right\}$ accept your help.
 c. The children $\left\{ \begin{array}{l} \text{actually usually} \\ \text{usually actually} \end{array} \right\}$ make their own suppers.
 d. All the recipes have been $\left\{ \begin{array}{l} \text{carefully painstakingly} \\ \text{painstakingly carefully} \end{array} \right\}$ tested.

I conclude that adjunction is a plausible approach to integrating adverbs into clausal structure and will adopt it in what follows.

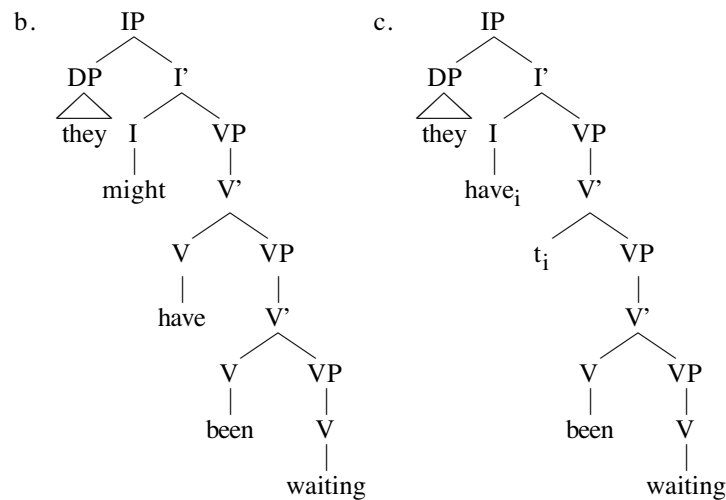
1.2.2 *where adverbs are realized*

I assume that English has the clause structure consisting of a unitary IP dominating VP (Chomsky 1986), as represented by the examples in (14). The specifier of IP is the canonical surface position of the subject.

Regarding the specific lexical content of the verbal and inflectional projections, I follow Chomsky 1957, Emonds 1976, Lobeck 1987 and numerous others in taking the modals, *must*, *can*, *should*, etc., to be lexically specified as being of category I°. Also of category I° are forms of support *do*, which I take to be

directly inserted into I° when needed. Accepting a long tradition dating back to Ross 1969, the auxiliaries *have* and *be* are of category V° . When the auxiliaries are tensed, they obligatorily undergo V° -to- I° head movement, which main verbs do not undergo (Klima 1964, Jackendoff 1972, Emonds 1976, Pollock 1989, Chomsky 1991 and many others). Under these assumptions, the structure of a sentence containing a modal or a finite auxiliary is (14), which illustrates the above assumptions.

(14) a. They (might) have been waiting.



Given that adverbs are adjoined elements, (15) and (16) constitute a proposal that will place adverbs in the linear positions described above.

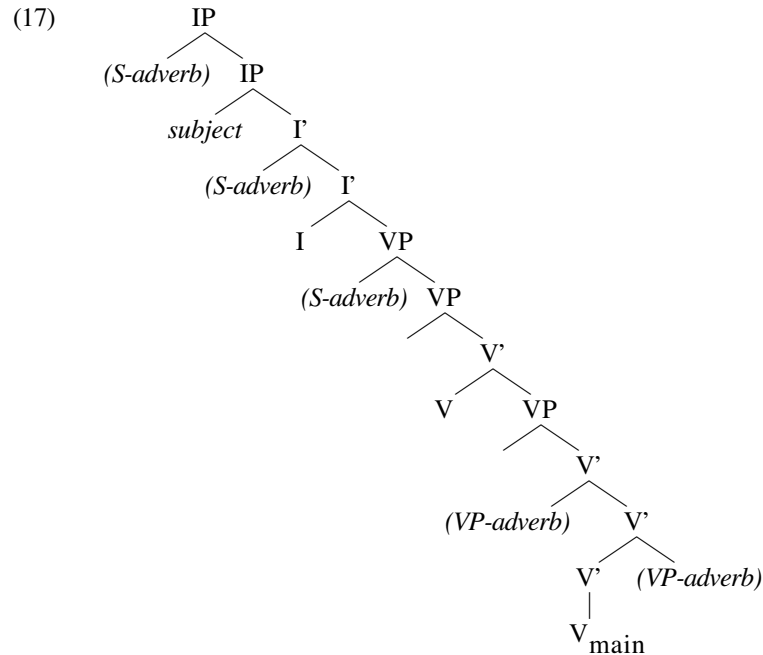
(15) *Syntactic Distribution of S-Adverbs*

- a. left adjunction to IP
- b. left adjunction to I'
- c. left adjunction to the topmost VP

(16) *Syntactic Distribution of VP-Adverbs*

- a. left or right adjunction to main verb V'

The proposal places adverbs in the positions indicated in (17). The reader can verify that these are just those desired given Jackendoff's description and that, consequently, the proposal captures the word order facts above. The following section demonstrates that the structural claims capture two additional sets of syntactic facts.



1.3. Syntactic Consequences

Two desirable syntactic consequences follow from the above proposal. First, (18) demonstrates that S-adverbs must always appear to the left of a VP-adverb in the preverbal position. This follows from (15) and (16) because an adjunction to (the topmost) VP will always be above a V' adjunction site.

- (18) a. Hulk Hogan [evidently]_S [completely]_{VP} annihilated his opponent.
 b. *Hulk Hogan [completely]_{VP} [evidently]_S annihilated his opponent.

Second, (19) and (20) illustrate that the two classes of adverbs behave differently with respect to their interpretation in VP ellipsis structures. When there is an empty VP (marked by \emptyset in the examples below) whose interpretation depends upon a VP antecedent which contains a VP-adverb, the VP-adverb must be interpreted in the missing VP, (19). In the case of S-adverbs, this is not necessary. The S-adverb may be included in the interpretation, (20a), but crucially need not be, (20b,c).

- (19) a. Helga easily won her race and Sophie will \emptyset too.
 \emptyset = easily win her race, *win her race

- b. Johnny blatantly disobeys the baby sitter because his sister does \emptyset .
 \emptyset = blatantly disobeys the baby sitter, *disobeys the baby sitter
 - c. Daisy thoroughly cleaned the pans since the automatic dishwasher couldn't \emptyset .
 \emptyset = thoroughly clean the pans, *clean the pans
- (20)
- a. No logician would knowingly state a falsehood even though a politician might \emptyset .
 \emptyset = state a falsehood, knowingly state a falsehood
 - b. Due to the traffic, we will unfortunately miss the opening credits, but those who were there early won't \emptyset .
 \emptyset = miss the opening credits, *unfortunately miss the opening credits
 - c. The Mafia allegedly set the hotel on fire since the owner wouldn't \emptyset .
 \emptyset = set the hotel on fire, *allegedly set the hotel on fire

These examples are accounted for under the assumptions that VP ellipsis targets VPs and that an S-adverb adjoined to VP creates a two segment category, either of which is a possible antecedent for VP ellipsis. Adjunction to V' in the case of VP-adverbs does not create a structurally ambiguous antecedent. There is only one VP that can be the antecedent and the VP-adverb is necessarily internal to it. It is worth pointing out that both sets of facts, without additional assumptions, would seem to rule out adjoining VP-adverbs to VP instead of V'.

Section 2 to follow attempts to demonstrate that, despite appearances, the distributional patterns in (15) and (16) also have theoretical support. It presents a theoretical foundation to the above distributional patterns. The fundamental analytical claim is that adverbs are licensed by lexical heads in some local domain. This licensing restricts where adverbs may appear and accounts for their realized structural positions.

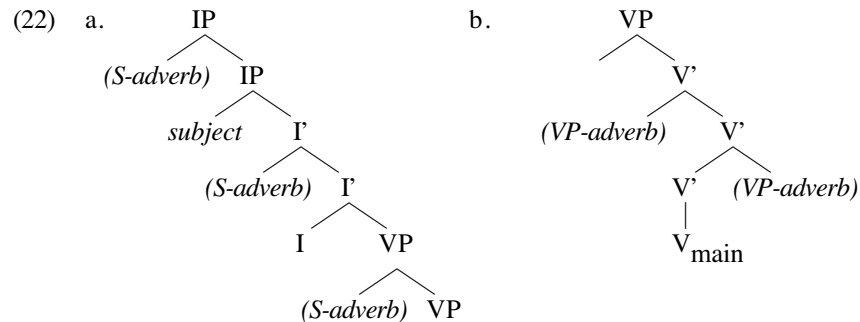
2 Adverb Licensing

A primary desideratum for any syntactic proposal regarding adverb placement is that it reflect the apparent link between what an adverb modifies and its syntactic position. This goal is a specific instantiation of what Sportiche 1988 formulates as the Adjunct Projection Condition, (21).

- (21) *Adjunct Projection Condition* (Sportiche 1988)
 If some semantic type X modifies some semantic type Y , and
 X and Y are syntactically realized as x and y , x is projected
 adjacent to either y or the head of y .

Sportiche's proposal, while intuitively desirable, is programmatic in the sense that it does not specify what the actual syntactic realization(s) of the semantic

modification are. This would hinge largely on the interpretation of “adjacent” in (21). The above proposal stipulates what these realizations are for adverbs but is compatible with Sportiche’s claim that it is the head of a modified element that plays a central role in the actual syntactic outcome. If we look more closely at the set of adjunction sites for S- and VP-adverbs, (22a,b), we see that each class clusters around a particular head, I° or main verb V°, respectively.



Accepting that such groupings have some validity, I will develop the hypothesis that the two adverb types are actually licensed in their syntactic positions by the respective heads (see Roberts 1986, Travis 1988, and Alexiadou 1994 for similar proposals and Bowers 1993 for an application of the idea). Adverbs are licensed by a head and must occur in a position that is syntactically associated with the head via some relation, call it R. I will formulate R as “in the government domain of”.^{3,4} Informally, a head H°’s government domain includes its specifier, phrases adjoined within its projection to H’, and those adjoined to the complement of H°. We may say, then, that S-adverbs/VP-adverbs must modify IP/VP within the government domain of the head I°/V°, as generalized in (23). Below I evaluate the success of this proposal with respect to the distribution of VP- and S-adverbs developed earlier.

- (23) *Adverb Licensing Proposal*
 Adverb classes are licensed by X° heads and must be
 structurally realized in the government domain of the head

2.1 VP-Adverb Licensing

The analysis correctly predicts the adjunction possibilities for VP-adverbs repeated in (16).

- (16) *Syntactic Distribution of VP-Adverbs*
 a. left or right adjunction to main verb V’

Adjunction to V' is within the government domain of V° . The arguments above indicated that VP-adverbs should not be adjoined as high as VP and, indeed, adjunction to VP is not a position in the government domain of V° , as desired. Exactly the configurations encoded in the structure in (22b) fall out. Although a VP-adverb adjoined to the complement of V° would also be in the government domain, such a structure is ruled out by the Adjunction Prohibition (Chomsky 1986, McCloskey 1992), which disallows adjunction to arguments of a lexical head—phrases that are s(emantically)-selected. It only permits adjunction to complements of functional heads, which are not s-selected.

2.2 S-Adverb Licensing

Now consider the distribution of S-adverbs in (15).

- (15) *Syntactic Distribution of S-Adverbs*
- a. left adjunction to IP
 - b. left adjunction to I'
 - c. left adjunction to the topmost VP

An adverb adjoined to the VP selected by I' will be in the government domain of I° . This accounts for (15c), which previously seemed like a rather odd restriction since reference to the ‘topmost’ VP is otherwise *ad hoc*. An adverb adjoined to I' , in (15b), is also transparently in the government domain of I° . An additional position in the government domain of I° not considered above is right adjunction in general. The adverb licensing proposal predicts that S-adverbs should adjoin on the right as well as the left, as was the case with VP-adverbs. This is in fact permitted. Typically there is a pause required before the adverb, (24). Thus the prediction is realized, although details remain to be understood.⁵

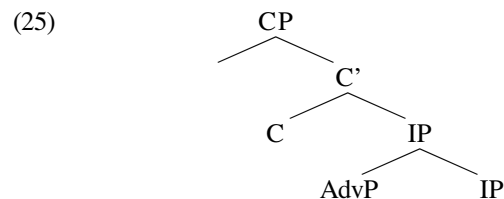
- (24) a. Horatio has lost his mind, *probably*.
 b. Casey thinks that there are guerrillas in the rose garden, *evidently*.
 c. Louis had rid the city of rats, *supposedly*.
 d. They’ll win *most likely*.

The remaining IP-adjoined position, (15a), however, is incorrectly ruled out. The proposal does not permit S-adverb adjunction to IP since an adverb in such a position would not be in the government domain of I° . We have already seen that this is the correct result for V° and VP-adverbs. Without modifying the definition of government, two options are available: 1) the IP-adjoined site is not a base-generated adverb position and an adverb that appears there is licensed elsewhere in the structure and moves to the IP-adjoined position or 2) an adverb in the IP-adjoined position is base-generated there and is licensed by some higher

head. In the present context, the latter alternative is the more interesting one and I explore it in the following section.

2.3 Licensing from C°

Given the structure in (25), it is clear that an adverb adjoined to IP will be in the government domain of C° just as an adverb adjoined to VP was in the government domain of I°. This provides a mechanical way of licensing IP-adjoined adverbs in the examples repeated in (3).



- (3) a. *Probably* Sam has been called.
 b. *Often* Max is climbing the walls of the garden.

Licensing clause-initial adverbs from C° leads to two expectations. First, since there are other positions in the government domain of C°, we expect to find adverbs in these positions as well—in particular, left adjunction to C'. Second, since I° and C° are distinct licensors, there is the possibility that an adverb will be licensed by only one of the two heads. Such an adverb, if licensed by I° but not C°, could appear immediately following the subject but not clause-initially. Both of these expectations seem to be borne out and are illustrated below.

The examples in (26) confirm the possibility of C'-adjoined adverbs. I assume that questions are CPs with the *wh*-phrase in the specifier of CP and the inverted auxiliary in C°. With reference to the structure in (25), C' adjunction places an adverb between these two elements as illustrated for (26d).

- (26) a. Who *possibly* can we call at this hour of the night?
 b. Which of them *apparently* does he not like?
 c. Where *conceivably* could one find a good buy on snow tires?
 d. [_{CP} where [_{C'} *most likely* [_{C'} will [_{IP} the spy meet his contact?]]]]

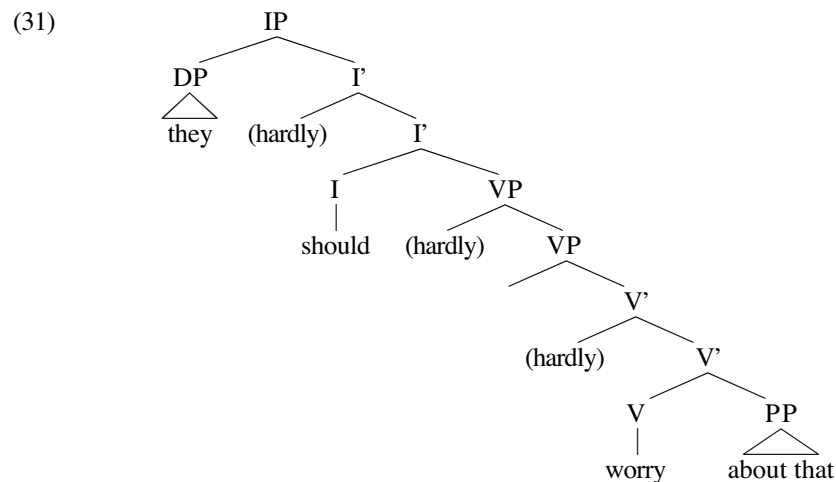
The second expectation is that there will exist classes of adverbs which are licensed by only one of either I° or C°. In addition to S- and VP-adverbs, Jackendoff 1972 describes a third class of adverbs which have the positional distribution of neither of the former two classes. Adverbs like *merely*, *hardly*, or *scarcely* do not fall into either class on syntactic or semantic grounds. I will call them E(XTENT)-ADVERBS since they approximately describe the extent or degree

to which a situation holds. Jackendoff gives their distribution as necessarily occurring somewhere between the subject and the main verb. (27) shows the immediate post-subject and post-modal positions. (28) illustrates that they may also appear to the right of a non-finite auxiliary. The clause-initial position is not possible, (29). As Jackendoff observes, only clause-internal positions are acceptable for E-adverbs.

- (27) a. He (*simply*) is (*simply*) incapable of it.
 b. The raccoons (*scarcely*) have (*scarcely*) touched our garbage.
 c. They (*hardly*) should (*hardly*) worry about that.
- (28) a. They must have *simply* gotten lost.
 b. John will have *merely* been beaten by Bill.
 c. They should have *hardly* worried about that.
- (29) a. **Simply* he is incapable of it.
 b. **Scarcely* the raccoons have touched our garbage.
 c. **Hardly* they should worry about that.

(30) extends the description of adverb placement the clause-internal positioning of E-adverbs. It places them in any of the positions in (31). The structure shown is for (27c).

- (30) *Syntactic Distribution of E-Adverbs*
 a. left adjunction to I'
 b. left adjunction to VP or V'



(30) is a statement of the distribution of E-adverbs. It can be captured by allowing E-adverbs to be licensed by I° and V°, but not C°. I° licensing will permit E-adverbs adjoined to I' and the topmost VP. V° licensing allows the adverb to adjoin to V' and to a VP that is the complement of some V°. These possibilities are seen in the structure in (31) and are exactly those proposed in (30), permitting only the data in (27) and (28).⁶ Crucially, the clause-initial position, (29), and the C'-adjoined position, illustrated by the ungrammatical examples in (32), are ruled out. These are the positions that would be licensed by C°. Such an analysis thus supports the idea that I° and C° are distinct licensing options.

- (32) a. *Who *simply* will he not invite?
 b. *Why *hardly* did Zoe talk to you?
 c. *What *just* didn't the students understand?

3 Conclusions

In this paper, I have investigated the syntactic distribution of several adverb classes in English and proposed an analytical basis for their realizations. The core of the proposal is the Adverb Licensing Hypothesis repeated in (23).

- (23) *Adverb Licensing Proposal*
 Adverb classes are licensed by X° heads and must be structurally realized in the government domain of the head

The results can be summarized by the table in (33). Individual adverb classes are licensed by a subset of the heads found in a canonical English clause.

- (33) *The Distribution of Some English Adverb Classes*

<u>CLASS</u>	<u>LICENSER</u>
S-adverbs	C°, I°
VP-adverbs	main V°
E-adverbs	I°, V°

Assuming that the proposal has some validity, two questions immediately arise. First, can the heads that license a particular class of adverbs can be determined from the meaning of the adverb? In other words, is there a relationship between an adverb's licensing head(s) and its interpretation? If so, the system would be maximally simple: the distribution of an adverb would be fully determined by its meaning and the Adverb Licensing Proposal. Work to date on the semantics of adverbs, however, has indicated that, if there is a mapping between the syntax and semantics of adverbs, it is rather complex. The

desired reduction may not in fact be possible.

Second, more general considerations lead one to ask how the proposal extends cross-linguistically. Other languages are argued to have both different adverb distributions and clause structure. How does the proposal apply to articulated Infl structures (Pollock 1989, Chomsky 1991, Bobaljik and Jonas 1996, and others)? With the introduction of additional heads, the licensing possibilities multiply. This may or may not be a desirable consequence. Additional work beyond this initial investigation is required.

Although the relative position of adverbs with respect to other elements in a clause is often used as a diagnostic on clause structure, such accounts are rarely explicit as to what the assumptions regarding adverb syntax are that allow the diagnostics to succeed. By developing and defending a unified account of adverb placement, we can use adverb position as a reliable probe on syntactic structure, including verb movement, subject positions, the placement of displaced constituents, and other central word order phenomena.⁷

Notes

I would like to thank Judith Aissen; Chris Kennedy; Jim McCloskey; participants in my 1996 Fall syntax seminar at UCSD; and audiences at UCSD, Swarthmore College, and WECOL98 (Arizona State University) for some excellent examples, interesting predictions, and thought-provoking discussions of this work. Potsdam 1998 contains a more extensive investigation of this proposal.

¹Ernst 1984 argues that S-adverb interpretations are not restricted as Jackendoff 1972 claims and that, in addition to the above, they may also be found after multiple auxiliaries. Some of his examples in (i) do seem acceptable. It is unclear why examples such as (i) are so infrequent or difficult to create. In general, S-adverbs do not sound grammatical when they are as far right as in (i)—as Jackendoff originally maintained and as I will idealize here.

- (i) a. The library staff has been *stupidly* filing all those articles on Raising in the child psychology section.
- b. Egbert might have been *cleverly* abducted to get an interview with the guerrillas.
- c. She may have *actually* been only aiming for the vice-president's job.

²Again, Ernst's (1984) proposal is less restrictive. In addition to permitting VP-adverbs next to the main verb, it allows them to the left of the passive auxiliary, as in (i). I will ignore this in the formulation above.

- (i) Bobby will have *handily* been beaten by Billy Jean.

³A fully equivalent proposal can be developed taking R to be “in the checking domain of” (Chomsky 1993).

⁴I assume the definition of government from Rizzi 1990:

- (i) *Head Government* (Rizzi 1990:6)
X head governs Y iff
a. $X = \{A, N, P, V, I, C\}$
b. X m-commands Y
c. no barrier intervenes
d. Relativized Minimality is respected

⁵In general, adverb positioning does not seem to be completely symmetric with respect to left and right adjunction possibilities, as the proposal would lead one to expect. Several alternatives might be pursued. Much work has suggested that government is sensitive to direction and directionality effects might be factored into the proposal. Alternatively, Kayne 1994 proposes that all right adjunction is prohibited. Under such an assumption, apparent cases of right-adjoined adverbs would require reanalysis (see Bowers 1993, Costa 1996). Lastly, discourse considerations might influence the choice of right versus left adjunction. In particular, if the right adjointed position has certain discourse properties which are largely incompatible with the use of a particular adverb, then the dispreference for the right-adjoined position might be accounted for.

⁶The proposal does not prevent right adjunction of E-adverbs, which must transparently be prohibited so that these adverbs do not appear clause finally. I have no explanation for this restriction. See the previous footnote.

⁷See Potsdam 1998 for an application of this system of adverb placement to the investigation of the syntax of less-well-studied imperatives and subjunctive complement clauses in English. The results obtained, using the proposed adverb distributions as a probe on clause structure, converge with those determined by independent diagnostics. That work thus provides further support for the general approach taken here.

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