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## MINIMAL CP AND THE ADVERB EFFECT<sup>1</sup>

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**Abstract:** New observations about a variety of adverb effects, with both positive and negative effects on acceptability, suggest that adverbs link to and "parentheticalize" a complementizer. This proposal along with a further proposal that the coindexation of a subject-positioned trace with a C is the result of a representational simplification of CP, facilitates explanation of an array of facts concerning the adverb effect, relative constructions, complement constructions, and embedded interrogatives.

Recent works on the Comp-trace effect and the adverb effect have posited a proliferation of structure. This article explores the opposite approach, arguing that CP phenomena including the Comp-trace effect and the adverb effect may instead find their explanation in terms of a reduction of CP structure, an economy of representation. The basic facts of the adverb effect are sketched out in section 1, and a CP recursion account of this effect is outlined in section 2. Sections 3 and 4 offer data and additional considerations which present problems for a recursion account and/or suggest the possibility of a different sort of analysis--minimizing structure. Section 5 offers an analysis of both the Comp-trace effect and the adverb effect based on minimizing structure. Section 6 deals with matters of data variation, and section 7 concludes.

### 1 The Adverb Effect

The adverb effect, as discussed by Culicover (1992a; 1992b; 1992c; 1993) and most recently by Browning (1996)<sup>2</sup> is illustrated in (1-3):

- (1) a. % Who did you say that would hate the soup?  
b. Who<sub>i</sub> ... say [<sub>CP</sub> t<sub>i</sub>' [c: [c that] [<sub>IP</sub> t<sub>i</sub> ...
- (2) a. Who did you say would hate the soup?  
b. Who<sub>i</sub> ... say [<sub>CP</sub> t<sub>i</sub>' [c: [c -WH]<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> ...

- (3) Who did you say that without a doubt would hate the soup?

Sentence (1) illustrates the Comp-trace effect,<sup>3</sup> and (3), the adverb effect. As shown in (3), an adverbial phrase positioned after a complementizer appears to mitigate or completely undo the Comp-trace effect. A central assumption of this work (as well as of much other recent and earlier work on this subject, e.g., Browning (1996), Culicover (1993), and Sobin (1991)) is that a trace in subject position is only licensed by a C which is coindexed with it, as in (2). The Comp-trace effect in (1) results when the C and the trace in subject position are not coindexed. Under these assumptions, the problem is to explain how the adverb effects the indexing of the relevant C in (3) to license the subject trace, allowing (3) as grammatical.

## 2 CP Recursion and the Adverb Effect

Browning (1996) offers a quite interesting account of the adverb effect in terms of CP recursion, generally assuming the minimalist program as articulated in Chomsky (1993). As noted, a Comp-trace violation results if a subject trace is not licensed by a coindexed C. The relevant structures of (1-2) are repeated here:

- (1) b. Who<sub>i</sub> ... say [<sub>CP</sub> t<sub>i</sub>' [C' [c that] [<sub>IP</sub> t<sub>i</sub> ...  
 (2) b. Who<sub>i</sub> ... say [<sub>CP</sub> t<sub>i</sub>' [C' [c -WH]<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> ...

In structure (2b), the subject of the lower clause has moved to the higher [Spec, CP] through the lower one. The trace of the moved subject t<sub>i</sub>' and C are in a Spec-head configuration, resulting in Spec-head agreement and coindexation, so the C now governs the subject trace in IP and is coindexed with it. Construction (1b) involves the same movement, but in this account a lexical C (e.g., that) cannot bear an index, so despite the fact that a subject trace and that are in a Spec-head configuration, the C cannot be indexed, and the subject trace in IP is not governed as it must be.

As for the adverb effect, the initially relevant portion of sentence (3) is (4a):

- (4) a. [<sub>CP</sub> without a doubt [C' that [ who would hate the soup...]

A consideration in the further derivation of this construction is clause-type. Following Cheng (1991)

and Watanabe (1992), this account assumes that a clause-type characteristic of a non-wh clause (in contrast to a wh clause) is that it has no [Spec,CP]. Thus, a clause with an adverbial filling [Spec,CP] such as (3a) cannot combine with a head (such as say) requiring a non-wh complement clause unless some operation can create the requisite empty Spec construction. Following Watanabe, this is the motivation for the next step in the derivation, that of extending the construction by moving the complementizer, as in (4b)<sup>4</sup> :

- (4) b. [CP [C' that<sub>C</sub> [CP AvP [C' t<sub>C</sub> [ who would...

Movement of the complementizer creates the complement clause structure required to complement say. Subsequent movement of the wh word<sup>5</sup> through the higher [Spec,CP] creates the construction in (4c):

- (4) c. Who<sub>i</sub>...[CP t<sub>i</sub>' [C' that<sub>C</sub> [CP AvP [C' t<sub>C</sub>/i  
[ t<sub>i</sub> would...

In structure (4c), one of the traces of who and the complementizer that are in a Spec-head relation. They undergo agreement, but the lexical complementizer cannot bear an index; however, it may transmit the index to its trace, which can bear an index. Thus, the subject trace in (4c) is governed by a coindexed C.

In response to the question of why vacuous recursion does not apply to clauses without adverbials allowing Comp-trace violations as in (5), it is argued that CP recursion is limited by Greed (Chomsky 1993).

- (5) a. [CP [C' that [ who would hate the soup...  
b. [CP [C' that<sub>C</sub> [CP [C' t<sub>C</sub> [ who would...  
c. Who<sub>i</sub>...[CP t<sub>i</sub>' [C' that<sub>C</sub> [CP [C' t<sub>C</sub>/i [ t<sub>i</sub>  
would...

In particular, the recursive structure in (4) is motivated by the demands on complement clause type of the verb. Those demands are met in (5a), so no such movement is necessary for the merger of the verb with the clause, and hence such movement is not possible here.

### 3 Questions about a CP Recursion Account

Despite its appealing aspects, the CP recursion analysis faces a number of difficulties, as will be

outlined here.

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(Co-)indexation of lexical complementizers First, the essential claim that lexical complementizers cannot bear an index appears questionable on analysis-internal grounds. As is apparent in (4b-c), the moved complementizer must be linked to its trace for the analysis to succeed. Coindexation is the normal, general means of accomplishing such linking. Though the subscript "C" establishes the needed relation, it seems more to mask the problem than to offer an explanation. It is somewhat difficult to see how this linking is not coindexing, and yet is enough like it to allow index to be passed on to the trace of the complementizer.

Further, there are indications that the complementizer that can in fact be indexed. First, on the assumptions of these other analyses, relative clause constructions such as (6) would most likely have an indexed that licensing the trace in subject position:

- (6) The person that<sub>i</sub> t<sub>i</sub> likes anchovies ordered the pizza.

Further, other languages or varieties of languages, including Dutch (Perlmutter 1971; Maling and Zaenen 1978), and French (Kayne 1981), and possibly Black American English (Pesetsky 1982) are attested not to exhibit a that-trace effect. Under the normal assumptions, there would be an indexed declarative complementizer licensing the subject trace, as in the Dutch example in (7):

- (7) Wie<sub>i</sub> vertelde je [<sub>CP</sub> dat<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> gekomen was ... ?  
who said you that come was  
'Who did you say that had come?'

(adapted from Perlmutter 1971)

Thus, a simple stipulation that the overt complementizer that cannot be indexed seems at least open to question.

Agreement Positioning Another question arises from positing adverbs in a Spec position: why should adverbs be placed in this position, given its character in the assumed theoretical framework as a position of agreement? Subjects occur here, and when other entities move into Spec position, they are also subject to agreement. Thus, a wh phrase moved into

[Spec, CP] agrees with the C head at least on the feature [+WH]. However, there is no proposal that these adverbials involve agreement<sup>6</sup>; hence their positioning here lacks the normal positive motivation.

**Additional Facts** Beyond the facts and considerations already noted, there are, I believe, some additional facts of interest, ones which point toward an analysis of a very different sort. These facts are subject to variation--that is, some speakers have these judgments more strongly than others. Such a state of affairs is not uncharacteristic of Comp-trace phenomena.<sup>7</sup> I think that, although they are variable in acceptability, the constructions below are strongly suggestive of a different approach to analyzing the Comp-trace effect and the adverb effect, an economy-of-representation approach, which will be pursued in subsequent sections.

For some speakers, the adverb in constructions like (3) easily forms a prosodic unit with the complementizer as shown in (8a), with the commas here marking significant pauses:<sup>8</sup>

- (8) a. Who did you say, that without a doubt,  
          would hate the soup?  
      b. Who did you say that, without a doubt,  
          would hate the soup?  
      c. Who did you say, that, without a doubt,  
          would hate the soup?

Given a choice between (8a) and (8b), other speakers claim to prefer the prosodic pattern in (8b), though these speakers tend to reduce the complementizer that (indicated by the reduced font size of that). One informant who claimed to prefer (8b) over (8a) suggested a revision to the prosody in (8c) as better than (8b). In (8c), the complementizer is set off, and the adverb is further set off. Such prosodic patterning suggests the possibility that the complementizer and the adverb may form a syntactic constituent, something which will be explored in greater detail below.

An additional fact pointing in the same direction is that adverbs may (again subject to some variation) similarly interact with double-filled Comp (DFC) constructions as in (9a-d):<sup>9</sup>

- (9) a. I just saw a person WHO, that for all  
          intents and purposes, could pass for  
          Albert Einstein!

- b. There are people WHO, that with very little prompting, would do some extreme things.
- c. Harvard has a player WHO, that with a little more work, could play for the Steelers.
- d. I just saw a sprinter WHO, that in all likelihood, will break the 200 meter record.
- e. \*I just saw a person who that could pass for Albert Einstein!

In (9a-d), an emphasized *who* and pauses setting off the complementizer and adverb is very "natural" for some informants, and for nearly all of the informants that I have asked, 9(a-d) are markedly preferable to (9e).

Third, an adverb may sometimes, but not always, successfully link to other CP elements. Thus, an adverb may link to a *wh* word in a relative clause, as in (10a), but not to a *wh* word in an interrogative, as in (10b):

- (10) a. I know the person, who without a doubt, ordered the anchovies.
- b. \*?I asked, who without any hesitation, would order anchovies.
- c. I asked who, without any hesitation, would order anchovies.

In (10b-c), the interrogative *who* is not reduced, and pauses are only possible as shown in (10c). I believe that sentence (10b) shows a rather interesting negative adverb effect.

For the body of this analysis, I will treat the data in (8) and (9) as though they were invariant, and in particular, as though (8a) and (9a-d) are significant indicators of what syntactic phenomena may be at work here, as I believe they are. In section 6 below, I return to the question of prosodic variance, since an account of it will rely on aspects of the analysis to be developed below.

How one approaches the adverb effect depends crucially on the analysis of elements in CP and on the analysis of the Comp-trace effect. There are reasons to suspect that what happens between the Spec and head

elements of CP may not be simple agreement. We turn to these next.

#### 4. Questions about Agreement in CP

Although a number of works have exploited the possibility that the Spec and head elements of CP simply undergo agreement (general Spec-head Agreement), there are nevertheless reasons to think that this might not be so. First, what I will call "pre-theoretic" agreement (e.g., subject-verb agreement) involves two overt elements, and one of them does not normally "disappear" in favor of the other. However, the norm in CP is for one element at most to appear, a fact nicely codified in the now classic Doubly-filled Comp Filter (Keyser 1975; Chomsky & Lasnik 1977).

Second, (pre-theoretic) agreement typically involves shared morphology or morphology reflecting coordinated choice of  $\phi$ -features (such as person and number). However, CP elements do not typically exhibit coordinated morphology or morphology indicating  $\phi$ -features. On the simplest of assumptions, if CP elements "agreed," one might even expect to find possible agreement constructions like (11) (with who being a singular element in [Spec, CP] and *is* occupying C) but of course, these are not found:

(11) \*Who is they visiting?

Such a possibility is not entirely negligible, since moved constituents can trigger agreement, as in passives such as (12):

(12) Mary is/\*are being visited (by them).

Finally, while agreement in CP as discussed in the literature (e.g., Browning (1996) or Sobin (1991)) is index sharing, it is not clear that normal subject-verb agreement is index sharing in any interesting sense.<sup>10</sup>

#### 5. CP Reduction

Given such considerations, it is possible that the Spec and head elements of CP are not undergoing agreement, but are undergoing a different process--structure reduction. Following a suggestion by Pesetsky (1982) and developed further in Sobin (1987), I suggest here that CP undergoes a structural simplification: under specific conditions, the Spec and head elements of CP collapse or fuse together into a single indexed element, as will be spelled out in greater detail below.<sup>11</sup> I refer to this process

simply as "Fuse". There are two subcases of Fuse, the case where a chain head is involved, and the case where a trace is involved. We will deal with each of them in turn.

CP Reduction Involving a Chain Head Here we consider first the basic operation of CP reduction with a chain head, and then its interaction with adverbs.

The basic operation: When a chain head (that is, an indexed wh phrase or null operator) is in [Spec, CP], Fuse works along the following lines. The chain head may collapse with C if either of these elements ([Spec, CP] or C) is overt (that is, phonetic).<sup>12</sup> As a consequence of this collapse, CP is simplified: the constituent C' is eliminated. The resultant head element bears the index of the chain head and has the form of the overt element. It also retains the mood feature of the original C. Still assuming, along with Browning and others, that the Comp-trace effect in (1) is due to the lack of a complementizer coindexed with a trace in subject position, Fuse results in an indexed C, and in licensing such a trace.

This process affects a range of constructions involving CP structure and elements which interact with it. Consider first the relative constructions in (13) through (18):

- (13) a. the person who ordered the anchovies  
 b. ... [CP who<sub>i</sub> [C' [C -WH] [IP t<sub>i</sub> ... ==>  
 c. ... [CP [C who]<sub>i</sub> [IP t<sub>i</sub> ...
- (14) a. the person that ordered the anchovies  
 b. ... [CP Ø<sub>i</sub> [C' [C that] [IP t<sub>i</sub> ... ==>  
 c. ... [CP [C that]<sub>i</sub> [IP t<sub>i</sub> ...
- (15) a. \*the person ordered the anchovies  
 b. ... [CP Ø<sub>i</sub> [C' [C -WH] [IP t<sub>i</sub> ... =/>
- (16) a. the person who Mary saw  
 b. ... [CP who<sub>i</sub> [C' [C -WH] [IP Mary ... ==>  
 c. ... [CP [C who]<sub>i</sub> [IP Mary ...

- (17) a. the person that Mary saw  
 b. ... [CP  $\emptyset_i$  [C' [C that] [IP Mary ... ==>  
 c. ... [CP [C that]<sub>i</sub> [IP Mary ...
- (18) a. the person Mary saw  
 b. ... [CP  $\emptyset_i$  [C' [C -WH] [IP Mary ... =/=>

(In (13-18), (b) shows the relevant details of each CP structure, and (c) shows the result of Fuse if it applies. The arrow indicates that Fuse applies, and the slash arrow, that it does not.) In (13), the Spec element *who* is overt, allowing Fuse to apply, resulting in a CP as in (13c) with the intermediate constituent C' eliminated, and a single indexed head which now licenses the trace in subject position. A similar situation holds in (14), with the complementizer that being overt. The result of applying Fuse is (14c), with the same reduced structure but with an indexed *that* licensing the subject trace. The CP in construction (15) cannot fuse, since neither CP element is overt; as a result, the trace in subject position is left without a coindexed C to license it, and (15) is ungrammaticality.

Constructions (16-18) work in parallel to (13-15), though here, no subject trace licensing is involved. Consequently, construction (18) is grammatical, in distinction to (15), despite the nonapplicability of Fuse.

The adverb effect: Consider next doubly-filled Comp constructions, as in (19-20) (= (9) above):<sup>13</sup>

- (19) a. I just saw a person who, that for all  
 intents and purposes, could pass for  
 Albert Einstein!  
 b. ... [CP *who*<sub>i</sub> [C' [C -WH]that AvP [IP *t*<sub>i</sub>  
 ... ==>  
 c. ... [CP *who*<sub>i</sub> [C' [C (that)]that AvP [IP *t*<sub>i</sub>  
 ... ==>  
 d. ... [CP [C *who*]<sub>i</sub> that AvP [IP *t*<sub>i</sub> ...
- (20) a. \*I just saw a person who that could pass  
 for Albert Einstein!

b. ... [CP who<sub>i</sub> [C' [C that] [IP t<sub>i</sub> ... ==>

Taking (20) first, I propose that Fuse can apply here; this simplification does not result in a loss of LF-relevant material, since the resultant element bears the mood feature of the original C (as it would in (13) and (16) above), and since that has a null allomorph, the effect on PF of applying Fuse here may be negligible (perhaps a sort of "contraction," as far as PF identity with an original numeration is concerned).<sup>14</sup> It is only a structural simplification. (Chomsky 1995:294) If this is the case, then the construction producible from the elements in (20b) is not (20a), but (21), with the CP structure in (21b):

(21) a. I just saw a person who could pass for  
Albert Einstein!

b. ... [CP [C who]<sub>i</sub> [IP ...

In such a construction, Fuse allows a more economical representation than the DFC structure, one with a simplified CP structure. Viewed in this way, a doubly-filled CP as in (20) forces an otherwise unnecessary constituent, C', and minimal representation does not allow superfluous constituents. Thus, it might be argued that the more economical representation blocks the less economical one, deriving the effect of the Doubly-Filled Comp Filter.

Now we turn to the adverb effect and to (19). Here, I propose that the adverb effect occurs because the adverb in constructions like (19), as well as in (3/8), is attaching to C and repositioning it as a part of a parenthetical expression, effectively rendering it invisible (or more accurately, as we shall see below, optionally visible).<sup>15</sup> This is strongly suggested by certain of the prosodic possibilities already noted. At this point, I will not attempt to resolve the very significant and much larger problem of the structural representation of parenthetical expressions.<sup>16</sup> For the time being, I will simply represent the parentheticalized C and adverb as an underscored sequence, as in (19). The structures in (19) indicate the essential features which these adjoined adverbs appear to impose. The phonetic C and the adverb may join into a single parenthetical constituent, and the C head position (with its phonetic content now removed to another location) may be viewed as phonetically null, as in (19b). Fuse will apply to this construction based on the phonetic form of the Spec element, yielding (19d),

with the phonetic C that not consumed by Fuse, but phonetically present and "displaced."

For the purposes of the overt condition on Fuse (the condition that one of the elements of CP must be overt), when a C has been parentheticalized, Fuse can choose to look at its phonetic form or not.<sup>17</sup> As stated earlier, the phonetic character of the C head position is "optionalized." The possibility of looking at C as phonetic is schematized in (19c) with a parenthesized that in C. This possibility is of no additional consequence here (that is, Fuse could apply here too), but this phonetic option does play a role elsewhere, as we shall immediately see.

Constructions (22-23) show the result of adding an adverb to some of the subject relatives considered earlier:

(22) a. (I know) the person, that without a doubt, ordered the anchovies.

b. ... [CP  $\emptyset_i$  [C' [C -WH]that AvP [IP t<sub>i</sub> ...  
=>

c. ... [CP  $\emptyset_i$  [C' [C (that)]that AvP [IP t<sub>i</sub>  
... ==>

d. ... [CP [C  $\emptyset_i$ ] that AvP [IP t<sub>i</sub> ...

(23) a. (I know) the person, who without a doubt, ordered the anchovies.

b. ... [CP who<sub>i</sub> [C' [C -WH]-WH AvP [IP t<sub>i</sub> ...  
==>

c. ... [CP [C who<sub>i</sub>] -WH AvP [IP t<sub>i</sub> ...

d. ... [CP [C -WH<sub>i</sub>]who<sub>i</sub> AvP [IP t<sub>i</sub> ...

In (22), the overt C has been parentheticalized with the adverb; Fuse now has the option just noted of looking at the C head position as phonetic (represented as (22c) or not (represented as (22b)). Here, it is (22c), the phonetic option, which allows Fuse to apply to reduce the CP structure, allowing C to license the subject trace, as in (22d). It is noteworthy that although a parentheticalized phonetic C considered by "Fuse" as phonetic (the (22c) option) triggers the reduction of CP, the complementizer is not properly in C (that is, it is no longer a proper

CP element), and a complementizer so positioned cannot contribute its phonetic form to the C element, so the resultant C head in (22d) is null.

Construction (23) shows something of further interest. Here, the overt chain head *who* in (23b) fuses with C, yielding (23c). The prosody of this example suggests that the chain head *who* can be "pulled through," so to speak, so that it is parentheticalized with the adverb, as represented in (23d). The now "empty" C remains -WH (noninterrogative), the normal C type for relative clauses.

Another observation further suggests that an adverb attaches to C, and not to other CP elements (Spec). While sentence (25) is quite acceptable (like (19) above), sentence (24) is not:

(24) \*?I just saw a book, which for all intents and purposes, that Mary would like!

(25) I just saw a book which, that for all intents and purposes, Mary would like!

Here, there is no subject trace problem. It appears that a *wh* word in Spec does not host an adverb. If it could, one might expect that the *wh* word could parentheticalize, leaving an effective null operator and rendering (24) as acceptable as (26):

(26) I just saw a book that Mary would like!

But such is not the case. So I take it here that the adverb only attaches to a *wh* word when it is in C.

That the adverb is indeed parentheticalizing C is further suggested by the contrast in grammaticality between the grammatical subject relative constructions (22) and (23) on the one hand, and the ungrammatical interrogative in (27b) on the other (this is the (10a-b) contrast mentioned earlier.):

(27) a. I wonder who, for all intents and purposes, is the mayor?

b. \*I wonder, who for all intents and purposes, is the mayor?

A subject relative construction (as already discussed in connection with (13-15)) must have an overt CP element, or the construction fails, as does (15). However, as shown in (22) and (23), in such subject relative constructions, one can nonetheless

parentheticalize this obligatory overt element. As argued above, although the parentheticalized overt element does not occupy the C position, one has the option of "looking" at its phonetic form, allowing Fuse to operate as it does, and yielding this "obligatoriness" effect--the construction would fail if Fuse did not apply. However, the parentheticalization or removal of C content is quite genuine, so that a construction with a parentheticalized/removed C will violate any condition which substantively requires the C head position actually to be filled (or, in other analyses, to be checked CP-internally). Such a condition is the one which requires that an interrogative C (+WH) must be lexically filled (or checked). The adverb attachment in (27b) genuinely displaces the wh word, leaving an empty (or unchecked) interrogative C, and thereby inducing a violation of this filling/checking condition on the interrogative C. In contrast, no such condition holds for non-interrogative C, and the lowering of the wh phrase in (23) (or that in (22)) is possible.

Now, let's turn our attention to the Comp-trace effect in (1) and the adverb effect in (3/8a).

CP Reduction Involving a Trace Here, we consider first the basic operation of CP reduction involving a trace, a non-chain head. Then we go on to consider the interaction of this operation with adverbials, the adverb effect in Comp-trace constructions.

The basic operation: Traces, which are not chain heads, also undergo Fuse, but not in the same way that chain heads do. The difference is reflected in a very striking contrast between subject relative clauses as in (13-15) and subject extractions as in (1-2): whereas a subject relative (with a chain head occupying [Spec,CP]) must have an overt CP element, a subject extraction (in English) as in (1-2) (in which a trace occupies [Spec,CP]) fails if its CP contains an overt element, as in (1). Following the earlier analyses of Kayne (1981) and (Pesetsky 1979/1980), the complementizer that is not simply unindexable as more recent work has claimed; rather, the source of the index is crucial. In terms of the present analysis, a chain head easily fuses with that, imparting its index, but a trace most naturally does not. As illustrated in (28) (= (2) above), a trace most easily fuses with a null C (preserving its covert character). Thus, a sentence like (2)/(28) has its subject trace licensed by a coindexed C and is uncontroversially acceptable:

- (28) a. Who did you say would hate the soup?  
 b. Who<sub>i</sub> ... say [<sub>CP</sub> t<sub>i</sub>' [c' [c -WH] [<sub>IP</sub> t<sub>i</sub> ...  
     ==>  
 c. Who<sub>i</sub> ... say [<sub>CP</sub> [c -WH]<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> ...

The Comp-trace effect illustrated in (1) is repeated in (29):

- (29) a. % Who did you say that would hate the  
       soup?  
 b. Who<sub>i</sub> ... say [<sub>CP</sub> t<sub>i</sub>' [c' [c that] [<sub>IP</sub> t<sub>i</sub> ...

In the unmarked instance, a trace will not collapse with the overt complementizer, as in (29b), leaving an unlicensed subject trace.

The adverb effect in Comp-trace constructions:  
 Now, as for the adverb effect on that-trace constructions, it is the same as in other cases, as shown in (30):

- (30) a. Who did you say, that without a doubt,  
       would hate the soup?  
 b. ... [<sub>CP</sub> t<sub>i</sub>' [c (that)]that AvP [<sub>IP</sub> t<sub>i</sub> ...  
 c. ... [<sub>CP</sub> t<sub>i</sub>' [c -WH]that AvP [<sub>IP</sub> t<sub>i</sub> ...  
     ==>  
 d. ... [<sub>CP</sub> [c -WH]<sub>i</sub>that AvP [<sub>IP</sub> t<sub>i</sub> ...

The adverb attaches to C, parentheticalizing it and rendering the phonetic character of the C head position as optional for the purposes of triggering Fuse. The CP structure in (30b) is the case where the C head is being viewed as "phonetic," and (30c) is the case where it is being viewed as null. As in all earlier cases, either view is possible. Here, since a trace is involved, it is the null C in (30c) which allows Fuse to apply, resulting in (30d), with a licensed subject trace, and thus we get the adverb effect on subject extractions.

Comp-trace variability One more aspect of the Comp-trace phenomenon should be mentioned here. In Sobin (1983) and (1987), it was argued that speakers of English actually show variable acceptance rather than simple rejection of that-trace constructions such as (1)/(29), in contrast to categorical rejection of sentences like (31) involving a subject extraction

over whether.

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- (31) \*Who did you wonder whether would hate the soup?

The variable acceptability of constructions such as (1)/(29) can now be explained as follows: as argued earlier at a number of points, the complementizer that (in contrast to whether) is indexable/fusable, but the source of the index, that is, the character of the other fusing element, is crucial. In the unmarked instance, a trace will not fuse with an overt C, but evidently, this is subject to some degree of variation (learnable from positive data), as in the Dutch sentence (7), or the French example in (32):

- (32) la fille que je crois qui est arrivée  
the girl that I think that has arrived

la première  
first

(Kayne 1981:119)

The variable treatment of (1)/(29) seems to acknowledge this parametric possibility, so to some extent, speakers in fact accept, and passively accept quite strongly, (1)/(29). This possibility is schematized in (33), where in (33c), the subject trace is licensed:

- (33) a. %Who did you say that would hate the soup?

b. ... [CP t<sub>i</sub>' [C that] [IP t<sub>i</sub> ... =%=>

c. ... [CP [C that]<sub>i</sub> [IP t<sub>i</sub> ...

Perhaps it is the case that such a construction is marked in a language such as English, since English allows null Cs, and in a language which does, one need not resort to strategies as in (33) which would render a trace as overt. The process may be less marked or unmarked, on the other hand, in languages which do not have null Cs, so that it is more readily available in Dutch or French than it is in English. This is quite speculative, and further work is called for.

#### 6 Some Remarks on Prosodic Variation

Let's return now to the question of variation in the prosody of examples like (8), with some speakers claiming to prefer the prosody of (8a), and others, that of (8b) or (8c). We have assumed that the prosody of (8a) is the one that is revealing of the syntactic analysis of the adverb effect. The prosody

of (8c) is unproblematic for the analysis here, since it is compatible with this analysis; it is quite plausible that (8c) simply reflects a further "marking off" of the AvP within the Comp-AvP constituent argued for here. As for (8b), although the C appears not to be marked off prosodically with the adverb, it is nonetheless noticeably reduced and somewhat "separated" from the verb.<sup>18</sup> It is possible that a pause immediately before the C, which would correspond with its syntactic analysis here, is being suppressed by the presence of another pause immediately after it. To see that such interactions exist, consider the prosody of nonrestrictive relative clauses, as in (34):

- (34) a. War & Peace, which everyone knows for its length, is a beautifully-written work.
- b. Mary, who we all know to be talented, was just admitted to Eastman.

Such relative clauses normally involve pauses, so much so, that it is conventional to indicate them with commas, as in (34). However, consider what happens to this prosody when an adverb phrase is introduced, as in (35-36):<sup>19</sup>

- (35) a. War & Peace, which, without a doubt, everyone knows for its length, is a beautifully-written work.
- b. War & Peace, which without a doubt, everyone knows for its length, is a beautifully-written work.
- c. War & Peace which, without a doubt, everyone knows for its length, is a beautifully-written work.
- (36) a. Mary, who, without exception, we all know to be talented, was just admitted to Eastman.
- b. Mary, who without exception, we all know to be talented, was just admitted to Eastman.
- c. Mary who, without exception, we all know to be talented, was just admitted to Eastman.

What we see in (35-36) is that while it is possible to render all of the pauses, as in the a examples, it is

also possible to reduce the pauses around the relative pronoun to a single pause either preceding or following the relative pronoun, as in the b and c examples. Here, the c examples are especially interesting, because they involve not significantly pausing before the relative pronoun but instead altering the prominence of the relative pronoun (indicated above by the reduced font size) and saving the major pause in that vicinity for the onset of the adverb phrase. In such a case, we would not be compelled to say that the constituency is fundamentally different from that of the other relative constructions, but rather that pauses in such proximity to each other may be reduced in favor of one or the other. In such a case, a syntactic boundary markable by a pause may alternatively be rendered as a reduction in prominence of a word.

Nonrestrictive relatives are constructions in which the prosody is present independent of any adverbial expression. In contrast, in the adverb effect constructions being considered here (repeated below for convenience), it is the introduction of the adverb phrase which induces the possible pauses.

- (8) a. Who did you say, that without a doubt,  
would hate the soup?
- b. Who did you say that, without a doubt,  
would hate the soup?
- c. Who did you say, that, without a doubt,  
would hate the soup?

By hypothesis, the adverb phrase attaches to C, forming a constituent. The adverb phrase itself is still capable of being prosodically marked off within that constituent. For those who prefer to do that, the initial pause preceding the C may be retained, as in (8c), or rendered instead as a reduced/deemphasized C, as in (8b). Hence, some speakers prefer the prosody of (8b) or (8c) to that of (8a), while others prefer the prosody marking the constituent formed by C-AvP, that of (8a). A preference for (8b) is, therefore, not clear evidence against the analysis offered here. Further, speakers' preferences among the possibilities in (35-36) might be different from their preferences among the possibilities in (8), since the prosody does not have the same source in both instances--in (35-36), it is partially independent of adverb introduction, whereas in (8), it is not.

Turning to variance in the acceptability of (9a-d) (repeated below for convenience), the problem here

is a bit different.<sup>20</sup>

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- (9) a. I just saw a person WHO, that for all intents and purposes, could pass for Albert Einstein!
- b. There are people WHO, that with very little prompting, would do some extreme things.
- c. Harvard has a player WHO, that with a little more work, could play for the Steelers.
- d. I just saw a sprinter WHO, that in all likelihood, will break the 200 meter record.
- e. \*I just saw a person who that could pass for Albert Einstein!

In the present analysis, sentences (9a-d) might give the appearance of having failed to undergo Fuse, an economy violation. From the standpoint of judging acceptability (a different kind of performance from actual production/use)<sup>21</sup>, it may be that one has to have the pause cue, with a pause strongly separating the relative pronoun and the C, rather than the C reduction cue, as discussed in connection with (8), to perceive that the C has parentheticalized with the adverb phrase, that Fuse has in fact applied, and that there is no consequent economy violation. If this is right, then there should be a correlation between having a preference for the prosody in (8a) and judging sentences (9a-d) fully acceptable. As far as I can tell from the informants I have asked, those who strongly prefer (8b) over (8a) also disfavor sentences like those of (9). Milder differentiation between the acceptability of (8a) and (8b) (where they are both judged possible) does not lead to disfavoring (9).<sup>22</sup>

#### 7 Final Remarks

This paper has proposed that CP undergoes a structural simplification which, in conjunction with considerations of economy of representation, goes toward explaining the Comp-trace effect, the doubly-filled Comp filter effect, and the adverb effect. The adverb effect follows from a parentheticalization of the complementizer with the adverbial, and the interaction of this resultant C-AvP constituent with the process of simplifying CP structure. This analysis seems more compatible with notions of representational economy than do analyses which elaborate or proliferate structure.

A large question in need of further resolution is one concerning the syntactic nature of parentheticalization. In certain respects, the adverb effect looks very much like a straightforward instance of parentheticalization à la McCawley (1982) in that a Comp-AvP sequence may be prosodically set off, and the surrounding material behaves as if the overt Comp-AvP were not present in the structure. One might propose a discontinuous structural analysis here, except for the fact that C, even though it is parentheticalized, may still play a limited role in serving as the phonetic trigger for Fuse. In this one respect, the parentheticalized C has a limited effect on its surroundings, suggesting its presence in the structure. Thus, this work points toward the need for further consideration of the structure and the structuring in of parentheticals.

It is also worth noting that the data as it is often rendered in work on the Comp-trace effect and the adverb effect is usually over-simplified. There is more variation afoot than the standard literature recognizes. For example, it is common practice in the literature to simply assign an asterisk to a sentence like (1a), when in fact speakers do not consistently reject it as they do other more uniformly unacceptable constructions such as (37):

- (1) a. \* Who did you say that would hate the soup?
- (37) \*Who did you ask whether would hate the soup?

Such variance can have significant consequences for the theoretical interpretation of these phenomena. Here, I have tried to take some of this variation into account. It would be of considerable interest to see how other approaches might treat it.

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<sup>2</sup> Rizzi (1997) also sketches an elaborated CP structure, which I have responded to elsewhere (Sobin ms.).

<sup>3</sup> Following Sobin (1983; 1987; 1991), (1a) is marked as involving variation in acceptability judgments, in contrast to the stark and systematic unacceptability of a construction with *whether* such as (i):

(i) \*Who did you ask whether would hate the soup?  
Sentence (3) is unmarked here, implying full acceptability. However, Browning (1996:237, fn 1) points out that for some speakers including herself, the additional adverb consistently improves acceptability, but does not consistently lead to complete acceptability. Further, though it is generally claimed that the adverb effect holds for both *that*- and *whether*-trace constructions, Browning cites Culicover, noting that "...the improvement in the case of *whether* is less noticable,..." (Browning (1996:237, fn 1))

<sup>4</sup> Browning uses a subscript "C" rather than an index to link the moved complementizer to its trace, presumably to comply with the stipulation that lexical complementizers cannot bear an index. Also, in the subsequent derivational stages, the adverbial here is abbreviated as "AvP".

5 Browning's example involves movement of a null operator in relative clauses.

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6 Culicover (1993:560) notes the same problem for the PolP analysis.

7 E.g., see Sobin (1987) and footnote 2 above. Also, the French Comp-trace construction in (32) below seems to vary in acceptability (Cristina Dye, personal communication), as does the Dutch example in (7).

8 The commas that appear in these examples do not necessarily follow English punctuation convention; they are only intended to reflect spoken pauses. The observations in (8) and (9) are based on inquiry among native speakers from a variety of regions of the U.S. The variation noted does not correlate with region. This will be dealt with further below.

9 As with the examples of (8), the capitalization and comma punctuation here reflect emphasis and pausing, respectively.

10 Thus, accounts must prevent the I (though it governs the subject position so as to assign it Case) from antecedent-governing the subject, or there should be no Comp-trace effect.

11 In a similar vein, but in a more *ad hoc* fashion, and without full consideration of the consequences, Rizzi (1997:312) proposes that separate C and I heads simply merge into a single entity.

12 The intuitive idea here is that in the unmarked instance, a chain head wants to be overt. This does not exclude the possibility of null operators.

13 As, noted earlier, I will deal with item (19a) here as though it were uniformly acceptable. Later I will offer some discussion of why its acceptability varies.

14 By contrast, Fuse cannot apply when C is filled with a more contentful element such as a modal or tense element, as in a question on an object such as (i):

(i) Who did Mary see?

Here, C is not the licenser of the object trace, so there is no consequent ungrammaticality. However, when C is required to license a subject trace in a normal, nonemphatic interrogative, such as in (ii), C cannot be filled with a tense/modal element:

(ii) a. Who saw Mary?

b. \*Who did see Mary?

Fuse must apply in (ii), yielding only (iia) as a possibility.

15 The visibility/invisibility being discussed here is not simple phonetic visibility/invisibility, but only visibility/invisibility with respect to the process Fuse. Thus in either (19b) or (19c), that is phonetically present/audible.

16 See McCawley (1982) and elsewhere for a exploration of parentheticals and possible discontinuous constituency.

17 Again, the claim here is that the real "phonetics" of that are present.

18 Thanks are due Carson Schütze (personal communication) for bringing this to my attention.

19 In the b and c examples here, the commas only indicate spoken pauses and do not follow standard written convention.

20 It is worth reiterating here that (9a-d) are generally regarded as being from more to very much more acceptable than (9e).

21 See Schütze (1996).

22 My further experience is that there are people who claim not to say them but who find them unremarkable in normal use, though they find sentences like (9e) remarkable (notably bad) and will call attention to them.

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