

ACDs and Internally-Headed Relative Clauses

Marcus Smith
December 2000
UCLA

Introduction

In recent years there have been many attempts to explain the syntax in antecedent-contained deletions (ACDs). These studies have investigated the behavior of the Binding Theory in relation to various elements inside the head and the relative clause. None of them, to my knowledge, have investigated sentence where the head of the relative clause contains an anaphor that must be bound by the subject of the relative. Nor have they examined the interpretation of idiomatic expressions in ACDs. In this paper, I will examine these two phenomena, and give an explanation of their behavior.

I will begin by discussing the three main ways in which resolution of ACDs has been analyzed, critiquing each in turn, and finally adopting the approach advocated by Hornstein (1994). I then outline a theory of relative clauses modified from the proposal by Sauerland (1998). The next step is to examine ACDs from the perspective of this hypothesis, and use it to determine why certain ACDs are grammatical or not. I will conclude with an observation about the configuration of ACD sentences and draw a parallel with parasitic gaps.

Quantifier-Raising

The standard treatment of ACDs argued for by May (1985) and assumed by much subsequent work involves Quantifier Raising of the quantified NP out of the VP, pied piping the relative clause along with it. In this way, the antecedent no longer contains the ellipsis site, and infinite regress is avoided.

Despite the many merits of this approach, there are problems with it in regards to current ideas about movement, as discussed by Hornstein (1994). Under Minimalist assumptions, all movement must be triggered: raising the quantifier to adjoin to VP (or some higher node) must be independently motivated. Adopting the proposal of Beghelli and Stowell (1996) would solve this problem, but there are other issues as well. The most crucial problem is that under Minimalist assumptions, LF movement does not pied pipe material. Indeed, if a feature movement approach is adopted, then even the quantifier itself is left in its S-structure position and only the quantificational feature is raised (Chomsky 1995). If this is the case, then the ellipsis site will not be moved out of the antecedent, resulting in infinite regress.

Extrapolation

Baltin (1987) suggests another approach, which is more troublesome than the QR story. He suggests that ACDs are resolved by extrapolation of the relative clause at S-structure, so that the antecedent does not contain the ellipsis site. This obviates a need for QR at LF, which could, in theory, resolve the problem of covert pied piping. Fox (2000) adopts this approach, though under slightly different assumptions. The problem with this approach, as pointed out by Hornstein (1994), is that extrapolation does not seem to be motivated. Indeed, neither Baltin nor Fox give any motivation for the movement except that it is necessary for ACD resolution.

While the motivation issue is a theory internal argument, an empirical fact against the extraposition approach is that ACDs are allowed in contexts where extraposition is not. Larson and May (1990) demonstrate this through the absence of complementizers and relative pronouns. A well known fact is that when a relative clause lacks both a complementizer and a relative pronoun, the clause cannot be extraposed. However, ACDs are still licit in those contexts. The following set, adapted from Larson and May, show this systematically. The relative clause in (1) is in post-head position, in (2) it has been extraposed, and in (3) it contains an ACD.

- (1) I visited a man who/that/∅ John mentioned recently.
- (2) I visited a man recently who/that/*∅ John mentioned.
- (3) I visited the man who/that/∅ you did.

(2) shows that extraposition is not possible unless there is some overt element in the left periphery of the relative clause. (3), however, shows that ACDs can occur in those circumstances that extraposition cannot. The only logical conclusion, then, is that extraposition cannot be the correct analysis.

A-Movement

A recent proposal by Hornstein (1994) departs from both the approaches above, by arguing that ACDs can be resolved through processes which are independently needed. Vacation of the VP can be achieved by movement to the accusative case position rather than any special process such as QR and extraposition. Movement to a case position is already required by the grammar, and most analyses of English delay that movement until LF, so the facts fall out quite naturally.

Although there are some problems with the specifics of his proposal, the main idea appears to be sound. As will be shown later, his suggestion that traces are copied without their indices cannot be correct. Also, his proposal that the copied material is greater than VP will also be shown to be impossible. These points do not have any bearing on his claim that resolution of ACDs is through LF A-Movement, however. An approach along these lines will be adopted for the remainder of the paper.

Multiply-Headed Relative Clauses

Kayne (1994) suggests that relative clauses are internally headed. The head NP is generated in the proper position inside the relative clause, then raises to the beginning of the clause. Evidence in support of this conclusion comes from sentences in which the head of the relative contains a reflexive which must be bound by the embedded subject. Evidence also comes from sentences in which an argument of the matrix clause is a portion of an idiom in the relative.

- (4) I read every book about himself that Twain wrote.
- (5) The picture of himself that Calvin saw was blurry.
- (6) The strings that Roger pulled got Daniel the job.
- (7) The shit that hit the fan yesterday is nothing compared to today's.

In sentences (4) and (5), the only possible argument to bind the reflexive is the subject of the relative clause. Thus, it is necessary for the head of the relative to be able to reconstruct into the embedded clause. If reconstruction must be to a trace position, then movement from the embedded VP is necessary to properly derive these examples.

Sentences (6) and (7) force an identical conclusion via a different route. The subjects of these sentences are parts of idiomatic expressions contained in the relative. Assuming that idioms are generated as a unit, this implies that the head must have been generated inside the embedded VP. This requirement is particularly acute for (6); since strings cannot get somebody a job, the matrix verb could not have selected only the head, it must have selected the entire NP including the relative clause. Taking this at face value, the structure of (4) is as follows.

(8) [I read [every book about himself [that [Twain wrote ~~every book about himself~~]]]]

This cannot be the correct analysis of all relative clauses; for some examples appear to require that the head be unable to reconstruct below the embedded subject. For instance, if the head contains an R-expression co-indexed with the relative subject, then a clause internal origin would result in a Principle C violation. This can be seen in (9) and (10) below. Furthermore, there are instances like (6) and (7) above, except that the idiom is in the matrix rather than relative clause, forcing a matrix origin for all parts of the idiom chunk. An example of this is shown in (11).

(9) I read every book about Twain_i that he_i wrote.

(10) The picture of Calvin_i that he_i saw was blurry.

(11) Daniel pulled the strings that got Roger the job.

If the head of the relatives in (9) and (10) occurred inside the embedded clause, then (9) would have the following structure.

(12) [I read [every book about Twain [that [he wrote ~~every book about Twain~~]]]]

Obviously, (12) would result in a Principle C violation. But since (9) is grammatical, it appears as though the head must not have originated in the embedded VP. The idioms paint a similar picture: In (11), “strings” must have been generated as a unit with “pulled” rather than as the agent of “got”.

The data seems to be contradictory. However, Sauerland (1998) proposes an account capable of dealing with both types of relative clause: he suggests that all relative clauses are both internally and externally headed. Two instances of the head are generated, one in the matrix clause and one in the embedded clause. The relative clause is then adjoined to the head of the matrix clause. The head internal to the relative raises into spec,CP, and a chain is formed between the two heads. At this stage in the derivation, the relevant portion of the sentence has the following structure.

(13) [every [[book about himself] [[which every book about himself] [that [Twain wrote ~~which every book about himself~~]]]]]

One of the heads must be deleted at LF, and the decision of which to is decided by the binding facts. If the head must be c-commanded by the subject of the relative, than the external head is deleted, allowing the internal head to reconstruct into the proper binding domain, avoiding a Condition A violation. If the head may not reconstruct, then the internal head is deleted, preventing a Principle B or C effect.

Since the decision of which to delete is based on binding necessities, it must be that the decision on which to delete does not take affect until application of the Binding Theory, i.e., at LF. Sauerland (1998) assumes that the LF structure is what is sent to Spell-Out. Because of this, he has to assume that when the internal head is retained, Phonology somehow pronounces the internal head before the relative pronoun instead of in its LF post-operator position. If we assume that Spell-Out occurs before reaching LF, then this is not a problem. We can simply stipulate that Phonology always pronounces the topmost portion of the chain rather than a lower link. Thus, the external instance will always be pronounced at PF, even though at LF either one may be deleted. The relevant portions of (4) and (9) are shown in (14) and (15), respectively, with (a) representing the PF structure and (b) the LF structure prior to reconstruction.

- (14a) [every [[book about himself] [that Twain wrote]]]
 (b) [every [which book about himself [that Twain wrote ~~which book about himself~~]]]
- (15a) [every [[book about Twain] [that he wrote]]]
 (b) [every [[book about Twain] [which that he wrote]]]

Before turning to the issue of ACDs, I would like to point out some cross-linguistic evidence that this analysis of RCs is on the right track. Since the position of the head at PF in English is due to a phonological rule, we may expect to see cross-linguistic variation on exactly this point. While in English we pronounce the external member of the chain and delete all but the quantifier (i.e., the relative pronoun) of the internal head, we can expect to find languages that do the reverse. That is, there should be languages that delete all but the quantifier/DP of the external head and pronounce the head internal to the embedded clause. There are two languages that appear to do exactly this: Chickasaw (16) and Mohawk (17).¹

- (16) *Oblaashaash ihoo im-alikchi-li-tok yammat hilha.*
 yesterday woman DAT-doctor-1s:I-PERF that:NOM dance
 ‘The woman I doctored yesterday is dancing.’ (Munro, 1997, p. 44)
- (17) *Uwári Ā-ye-’níkhu-’ ne ute-whahs-a-rátsu-’.*
 Mary FUT-FsS-sew-PUNC DET FACT/NsS/SRFL-skirt-?-tear-PUNC
 ‘Mary will sew the skirt that just tore.’ (Baker, 1996, p.173)

¹The abbreviations in these examples have the following meanings: DAT ‘dative’; 1s:I ‘first person singular active’; PERF ‘perfective’; NOM ‘nominative’; FUT ‘future’; FsS ‘feminine singular subject’; PUNC ‘punctual’; DET ‘determiner’; FACT ‘factual’; NsS ‘neuter singular subject’; SRFL ‘semireflexive’. Some of these abbreviates have been changed from the sources.

In both examples, the head of the relative occurs inside the embedded clause, but the modifying demonstrative occurs outside the clause. The Chickasaw example in (16) is the more transparent of the two, since the head *ihoo* ‘woman’ occurs before the verb and carries the case marking typical of its position, but its modifying demonstrative *yammāt* ‘that’ occurs after the verb (a position that must be outside the clause) and is case marked as the subject of the matrix clause. Chickasaw, then, is almost a mirror image of English in terms of what is deleted at PF.

The Mohawk example in (17) provides convincing evidence from another angle. The head *anitskwara* ‘chair’ has been incorporated into the verb of the RC, suggesting that it must have been inside that clause’s VP. Judging from the examples in Baker (1996), the determiner *ne* never seems to modify an incorporated noun, though it often appears immediately before post-verbal objects. Indeed, *ne*, unlike the demonstratives and quantifiers, may never be separated from the NP it modifies. If this is an accurate generalization, then *ne* could only be modifying the relative clause as a whole or a phonologically null object external to the RC.²

ACDs and the Binding Theory

We saw in the previous section that the head of a relative clause may be co-referential with the embedded subject without resulting in a violation of the Binding Theory, regardless of whether the head contains an anaphor or R-expression. Both Principles A and C can both be satisfied in apparently identical surface structures. As if this were not interesting enough, the situation becomes more complex when these facts are applied to ACDs. Before considering the grammaticality judgements in this domain, let us first look at how the theory of relative clauses above would work.

First of all, I assume that what has been deleted is not a VP, but a V’. The reason for this assumption is simple: if the copying were of the entire VP, then the embedded VP would gain the trace of the matrix subject. The embedded subject would not have a trace inside its VP, thus would be unable to receive a theta-role. Hornstein (1994) suggests that this is not problematic if traces are copied without indices. There are two reasons this proposal cannot be adopted. The traces assumed here are not impoverished, as are Hornstein’s, so when the trace of the subject is copied into the relative clause, what is being transferred is a silent copy of the matrix subject. Even if indices are not copied, then, the embedded subject could not successfully bind the copied trace since they are distinct. Also, as we shall see later, indices must be copied. The only other option available would be to abandon the VP internal subject hypothesis, which I find empirically and theoretically undesirable.

Another possibility would be to assume that only the verb is elided. The object is based generated internal to a VP headed by *do*, which is replaced by the matrix verb as LF. Though this idea could work for transitive verbs, it fails when anything more complex is considered, such as ditransitive verbs.

(18) Peter gave his brother the same book that John did.

(19) Peter gave everyone that John did five dollars.

²The former possibility does not seem likely; for in the data Baker gives, *ne* never modifies a complement or adjunct clause: it only modifies relative clauses and NPs.

Clearly, the object that is not modified by a relative clause must be copied along with the verb. Thus, the copied material cannot be a simple lexical item.

Note further that (18) may only have a strict reading, not a sloppy one. It is necessarily Peter's brother who received the book from John. This result can be replicated with other types of sentences.

(20) Peter gave the same book John did to his brother.

(21) Everyone's mother told him the same story his father did.

(20) has the same interpretation as (18), though this is done by copying material of a different nature. (21), like (18) and (20), may only have a strict reading, such that it for every person, that person's mother and father told him the same story. These facts tell us that indices must be copied along with the traces, contra Hornstein (1994).

Having established that the V' is elided, it is now necessary to discover where the internal head would be generated. The obvious solution would be to generate it in the first appropriate A-position above the theta-site. Under standard approaches, this would be spec,AgroP.³ Not only is this the obvious solution, it also seems to be the only solution. If it were generated in a position higher than the first available one outside VP and only the V' were copied into the relative clause, then there would be a potential landing site for movement left unoccupied, resulting in a violation of Relativized Minimality (Rizzi 1990). From there, the derivation could proceed as normal. The LF structure of the relative clause in an ACD context is as shown in (22). (EH = external head; IH = internal head)

(22) EH [[OP IH] [that Subj do [~~OP IH~~] Subj <V EH>]

The internal head was generated along with the operator outside VP, then moves into spec,CP. The trace of the external head is copied into the embedded VP along with the verb. Since the internal and external heads form a chain, the copy of the external head can safely serve as the theta position for the internal head.

There is very little to say about the position of the relative clause within the matrix clause. Merchant (2000) and Fox (2000) point out that the only requirement is that the clause containing the ellipsis not be inside the VP at LF. There are two ways to do this. Merchant (2000) allows for the deletion of VP-internal trace of the relative clause at LF. Fox (2000), on the other hand, merges the relative clause with the external head after extraposition has taken place, circumventing the infinite regress problem by never allowing the ellipsis site inside the VP in the first place. Either approach is compatible with my claims, so I will not decide between them.

We will begin the investigation of Binding Theory and ACDs by looking at Principle C situations.

³Another possibility would be to follow Sportiche (1999) in generating determiners and quantifiers outside the VP. This would give the benefit of explaining why the quantifier modifying the external head need not be identical to the quantifier of the internal head. Simply put, only the VP is copied, and so the quantifiers are not included in the process. However, it would still need to be explained how the quantifier of the other object in a double-object construction gets copied into the relative clause.

- (23) His mother clipped every article by John_i that he_i did.
 (24) Sally had heard all the rumors about John_i that he_i had.

As can be seen in (23) and (24), co-reference between an element in the head and the subject of the relative clause does not result in a Principle C violation. This is exactly what the analysis of non-elliptical relative clauses predicts to occur. To see this, consider the structure of (23) immediately after copying takes place.

- (25) [every [[article by John] [which article by John that he ~~<clipped article by John>~~]]]

As discussed above, the internal head was generated in the first available position outside the V', and raises to spec,CP forming a chain with the external head. At LF the matrix V' is copied into the ellipsis site. This places a copy of the external head inside the relative clause. Since the internal head and external head are co-referential, it logically follows that the base-generated copy of the external head is co-referential with the base-generated copy of the internal head. Thus, the copy of the external head forms the basis of the chain internal to the relative clause. Now, because only one instance of the head may be preserved, either the internal or external head must be deleted. Deletion of the external head would result in an ungrammatical sentence, since 'he' would c-command 'John'. Deletion of the internal head would not result in a binding violation, because the pronoun no longer binds an R-expression, as shown in (26). (26) is identical in structure to (13b) (repeated here as (27)).

- (26) [every [[article by John] [which that he ~~<clipped>~~]]]
 (27) [every [[book about Twain] [which that he wrote]]]

Next we consider sentences where the head contains an anaphor which must be bound by the embedded subject.

- (28) *His mother clipped every article by himself that John did.
 (29) *I read more books about himself than Peter did.

Assuming, as argued for above, that traces are copied with their indices, this result is not surprising. To see why, consider the derivation. The first step is generate the internal head outside the embedded V', then raise it to spec,CP. This internal head must be co-referential with the subject of the embedded clause, otherwise the sentence could never be grammatical under a reading where the embedded subject binds the reflexive. The anaphor in the matrix clause is co-referential with the matrix subject. Thus, because the external and internal head contain different indices, they cannot form a legitimate chain. Furthermore, when the trace of the external head is copied into the embedded V', the anaphor in this copy will also have a co-reference distinct from that of the internal head. This copy cannot form a legitimate chain with the internal head either. Even assuming that a chain could be formed between two non-identical elements, the copied trace would not be properly bound, since no instance of the matrix subject occurs in the relative clause. This can be seen in the LF structure of (16) as shown in (28).

- (30) [every [[article by himself_i] [[which article by himself_k] [that John ~~which article by himself_k~~
<elipped article by himself_k>]]]]]

No matter which head is deleted to satisfy the Binding Theory, the structure will remain ungrammatical. Thus, an ACD with an anaphor in the head of the relative clause is ruled out for two distinct reasons.

ACDs and Idioms

The availability of idiomatic expressions in ACD contexts patterns with the anaphors seen above. Ellipsis voids any possibility of an idiomatic reading, as can be seen in the following examples.

- (31) *The feathers hit the fan the shit did.
(32) *The coach sent Jim to the showers that the umpire did.
(33) *Garfield smells every rat that I do.

The problem with the sentences is not that idioms cannot be used in the head of a relative clause. We can see by comparing (7) with (31) that the difference lies in the fact that the relative clause contains an ellipsis.

The explanation of this is similar to the analysis of anaphors discussed in the previous section. The crucial point is that in, for example, (31) the external head was generated like the typical argument of a transitive verb. The problem lies in that since the V' is ellided, the idiom cannot be inserted into the structure. It is doubtful whether the object of an idiom can be generated outside the VP if the verb is not generated as well. Even if this is possible, when the V' of the matrix clause is copied into the relative clause, the copied material is non-idiomatic, thus, an idiomatic reading is impossible.

There is one more point that makes idioms interesting. Even if both clauses contain the same idiom, an idiomatic reading is impossible.

- (34) *My mother hit the roof my father did.
(35) *Jack cut the cheese that John did.

The inability to get an idiomatic reading cannot be due to the copying of unidiomatic material as suggested above. Instead, this evidence suggests that the object of an idiom cannot be generated separately from the verb. The heads of these clauses seem to carry referential properties, suggesting that the internal head, by virtue of having been generated separately from the verb, is referential rather than idiomatic. This would mean that the external head and internal head bore different features, so could not form a chain, which would cause the derivation to crash. The only means to rescue the structure would be to assign the external head a referential reading rather than idiomatic. Thus, these sentences can only receive non-idiomatic interpretations.

A Note on Configuration

Both Baltin (1987) and Hornstein (1994) make a comment that is very insightful and provocative, though nobody to my knowledge has expanded on the idea. Both mention that the ellipsis site is anaphoric on the matrix verb. Indeed, the matrix verb is often referred to as the

antecedent of the ellipsis site. When dealing with arguments of a clause, anaphoric relationships are usually argued to be sensitive to c-command. Clearly in these contexts we cannot say that the matrix V' c-commands the ellipsis site, because the ellipsis is only either internal to the antecedent or raise above it. However, if we follow the ideas of Kayne (1994, 1998) we can say that all movement is overt and all precedence is mapped from asymmetric c-command. If this is correct, then the verb is likely to c-command all material following it. This means that the verb which heads the V' that gets copied into the ellipsis site will c-command that ellipsis. Without justifying this claim extensively, I just note that all the examples in this paper conform to this prediction, as do most if not all of the sentences included in the relevant papers cited.

If this generalization turns out to be correct, then the structures involved in ACDs display an interesting pattern. Since the relative clause has been raised out of the antecedent V', then neither the trace of the verb nor the ellipsis site c-command each other. Both will be c-commanded by the verb. This is the same configuration found in parasitic gaps. It seems unlikely to me that two separate constructions in which a moved element is interpreted in two different locations can be completely unrelated. Some common interpretive strategy is probably at work in both situations. This is a question I will leave unexplored, as it lies outside the scope of this study.

Conclusions

The analysis that arises from this paper are important ones for the proper treatment of ACDs. Most importantly, it shows that traces must be copied with their indices intact. To do otherwise would allow for binding of an anaphor in the head of a relative clause containing ellipsis. Furthermore, under a copy theory of movement, it is necessary that the material copied into the ellipsis site be only the material that forms a constituent with the base position of the verb. To include material above that would result in a clause with two distinct subjects, which would necessarily cause the derivation to crash.

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