

**AN UNMEDIATED ANALYSIS OF  
RELATIVE CLAUSES**

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The standard analysis of relative clauses takes the relativized element in the relative clause to be a pronoun, sometimes unexpressed. However, consideration of internally-headed relative clauses, the behavior of idioms, and the cross-linguistic forms of relative clauses argue for a constraint-based version of the alternative “raising” analysis.

## 1. Introduction

This paper<sup>1</sup> deals with the analysis of (restrictive) relative clauses. In this paper, I will argue that a consideration of the forms that relative clauses take suggests an alternative to the current consensus analysis, an alternative which has roots in the transformational literature of the 1970s and has been adopted in some current transformational analyses.

The standard view of relative clause constructions is that they consist of three parts: the head, the relative pronoun, and the clause.

- |     |                    |                         |                       |
|-----|--------------------|-------------------------|-----------------------|
| (1) | the word processor | which                   | Bill prefers <i>e</i> |
|     | <b>head</b>        | <b>relative pronoun</b> | <b>clause</b>         |

This view holds the relative pronoun to be the central component of this construction, as it serves to link the other two elements of the construction: it is coreferential (or coindexed) with the head, and it has a grammatical function (and in transformational accounts originates) in the clause. The relation between the head and the in-clause function is indirect, mediated anaphorically by the relative pronoun. I will refer to this as the **anaphorically mediated** analysis of relative clauses.

Anaphorically mediated analyses of this kind represent a broad consensus in syntax, one which transcends disagreements about theoretical framework. From this perspective, it is very odd that there is an alternative form for relative clauses in English, one in which there is no relative pronoun:<sup>2</sup>

- |     |                    |        |                       |
|-----|--------------------|--------|-----------------------|
| (2) | the word processor | (that) | Bill prefers <i>e</i> |
|     | <b>head</b>        |        | <b>clause</b>         |

The existence of this kind of relative clause suggests a direct relation between the head and the in-clause position, what we might refer to as an **anaphorically unmediated** analysis. Yet, since Chomsky (1977) the standard analysis of this kind of relative clause has been an anaphorically mediated analysis, in which the mediating element is an unexpressed pronominal element. This is also the

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<sup>2</sup>I am assuming, as is standard, that the optional *that* in finite relative clauses is the ordinary finite complementizer and not a relative pronoun.

standard analysis in LFG, with a [PRED ‘PRO’] element functioning as TOPIC in the relative clause (Dalrymple 2001, Falk 2001).

This paper will argue for an anaphorically unmediated analysis of relative clauses. In §2 I will present new typologically based arguments for an anaphorically unmediated analysis and in §3 I will revisit some old arguments. This is followed with an analysis in §4. Finally, in §5 I return to what is standardly taken to be the paradigm case of relative clauses, the ones with relative pronouns. I will show that they also should be analyzed as anaphorically unmediated, and provide an explanation for the existence of this form of relative clause.

For the sake of style, I will drop the word “anaphorically” for the rest of this paper, and simply refer to “mediated” and “unmediated” analyses. The intention remains that the mediating element is an anaphoric element.

## 2. Typology

### 2.1. *Wh* Constructions

Relative clauses are one example of a class of constructions that has been referred to variously in the literature as *wh* movement (Chomsky 1977), long-distance dependencies (Bresnan 2001), unbounded dependencies (Pollard and Sag 1994), and  $\bar{A}$  dependencies (Chomsky 1981), among other names. We will refer to them here as *wh* constructions.

What typifies *wh* constructions is that a single element has more than one function, potentially in distant clauses. Consider, for example, the following *wh* question.

- (3) Who were you told that computer industry experts claim uses the TextMangler wordprocessor?

In this sentence, the DP *who* functions both as FOCUS in the main clause and as the SUBJ of *use* two clauses down in the sentence.

*Wh* constructions face what might be thought of as a realizational problem. If an element has two different grammatical functions, potentially in different clauses, in which position is it expressed overtly? Assuming some notion of economy, it is unlikely to be expressed in both positions. In principle, one would expect that either the higher or the lower position should be available for realizing the multifunctional element. And this is exactly what we find: some languages choose the structural position of the lower function, some choose the structural position of the higher function, and some allow either.

- (4) Mandarin (low position only) (Huang 1982: 371)  
Zhangsan xiangzin shei mai-le shu?  
Zhangsan believe who bought books  
‘Who does Zhangsan believe bought books?’

- (5) Egyptian Arabic (low position only) (Kenstowicz and Wahba 1983: 263)
- a. Fariid ḥatt ʔeeh ʔala l- tarabeeza.  
Fariid put what on the- table  
'What did Fariid put on the table?'
  - b. Fariid ḥatt kitaab miin ʔala l- tarabeeza?  
Fariid put book who on the- table  
'Whose book did Fariid put on the table?'
  - c. Fariid ḥatt kitaab Mona ʔala ʔeeh?  
Fariid put book Mona on what  
'What did Fariid put Mona's book on?'
- (6) English (high position only)  
Which word processor do you think Bill uses?
- (7) Kikuyu (either position) (Bergvall 1983: 247)
- a. Oyweʃi:ria Goye oiɣire maheire keɣaɣi o:  
you.think Ngũgĩ said they.gave crab who  
'Who do you think Ngũgĩ said they gave a crab to?'
  - b. Noo oyweʃi:ria Goye oiɣire maheire keɣaɣi?  
FOC.who you.think Ngũgĩ said they.gave crab  
'Who do you think Ngũgĩ said they gave a crab to?'

I will use the familiar but misleading term “in-situ” for the low realization construction.

For our purposes, the in-situ construction is important because it provides valuable information about the nature of *wh* constructions. While the “moved” construction, as in English, provides evidence for one function of the *wh* element, the in-situ construction provides evidence of the other one.

## 2.2. Internally Headed Relative Clauses

The “in-situ” construction associated with relative clauses is what is often referred to as the internally headed relative clause (IHRC).

- (8) a. Dogon (Culy 1990: 21)
- |   |        |        |         |                      |   |
|---|--------|--------|---------|----------------------|---|
| [ | Kandow | nyan   | ge      | tɛgɔ                 | ] |
|   | just   | fire   | granary | burn.PSTNARR.3SG.DEF |   |
|   | ne     | yu     | gaw     | to.                  |   |
|   | in     | millet | a lot   | exist.3SG            |   |
- 'There was a lot of millet in the granary that the fire just burned.'
- b. Imbabura Quechua (Cole 1982: 49)
- |   |        |        |     |        |      |      |      |        |     |
|---|--------|--------|-----|--------|------|------|------|--------|-----|
| [ | Wambra | wagra- | ta  | randi- | shka | ]    | ali  | wagra- | mi. |
|   | boy    | cow-   | ACC | buy-   | NMNL | good | cow- | FOC    |     |
- 'The cow which the boy bought is a good cow.'

- c. Mooré (Culy 1990: 76)  
 [ Yāmb sēn yā dao ninga zamē wā ] bee ka.  
 2PL AUX saw man INDEF yesterday DEF be there  
 ‘The man that you saw yesterday is here.’
- d. Navajo (Platero 1974: 214)  
 [[[ Hastiin lééchaq’í yiztał ] nisin ]  
 man dog 3.PERF.3.kick IMPFC.1.think  
 ni- (n)éé] nahał’in.  
 IMPFC.3.say- REL IMPFC.3.bark  
 ‘The dog which he said he thought the man kicked is barking.’

As with in-situ questions, the IHRC is an alternative solution to the realization problem.

What is notable about IHRCs is the insight they provide into the nature of relative clauses. They show a direct connection between the external head position and the in-clause position: the choice of where to realize the relativized element is limited to these two positions. Agreement provides evidence that there is a direct connection. For example, in Dogon the verb agrees with the subject. If the relativized element is the subject of both the verb inside the relative clause (where it appears) and of the larger clause in which the relative construction is embedded (where it does not appear), both verbs must agree with it (Culy 1990: 83–84):

- (9) a. Ya [[yaan pilli wən] gɔ] Moti  
 yesterday women White see.NPST.PL DEF Mopti  
 boliya.  
 go.PSTNARR.3PL  
 ‘The women who saw the White yesterday went to Mopti.’
- b. Ya [[yaan pilli wɛ] gɔ] Moti  
 yesterday women White see.NPST DEF Mopti  
 boliya.  
 go.PSTNARR.3PL  
 ‘The women who the White saw yesterday went to Mopti.’
- c. \*Ya [[yaan pilli wən] gɔ] Moti  
 yesterday women White see.NPST.PL DEF Mopti  
 boli.  
 go.PSTNARR  
 ‘The women who saw the White yesterday went to Mopti.’

This shows that the relativized element is syntactically associated with both positions. Crucially, IHRCs provide no evidence for a relative pronoun, or for a mediated analysis of the relative clause construction.

It is instructive to consider what an in-situ mediated structure would look like. Consider (8d). Under the non-mediated analysis, ‘dog’ is both the

head of the construction and the clause-internal relativized element. In English it is realized in the position of the head, and in Navajo in the clause-internal position. However, under a mediated analysis, the head position is not part of the same functional unit as the clause-internal position. Instead, the clause-internal position is linked to the mediating relative pronoun. Under the mediated analysis, one would expect an in-situ relative clause to look not like the IHRC in (8d), which we can schematize as (10a), but rather like (10b).

- (10) a. The [that he said he thought the man kicked dog] is barking.  
 b. The dog [(that) he said he thought the man kicked which] is barking.

Structures like (10b) appear not to exist, at least not in this form. (10b) resembles a resumptive pronoun construction (for competing LFG analyses, see Falk 2002 and Asudeh 2004), but resumptive pronouns crucially are not *wh* relative pronouns but ordinary personal pronouns. Resumptive pronoun relative clauses thus also provide no reason to accept a mediated analysis.

We conclude, therefore, that in-situ constructions provide evidence against the mediated analysis of relative clauses. They suggest very strongly that the correct analysis is the unmediated analysis.

### 2.3. Pronoun-less Relative Clauses Cross-Linguistically

The existence of pronoun-less relative clauses in English is not a quirk. Relative clauses which appear to be unmediated (with or without an invariant relative particle/complementizer) are quite widely attested.<sup>3</sup>

- (11) a. Hebrew  
 meabed hatamlilim še Bill maadif  
 processor DEF.texts COMP Bill prefers  
 ‘the word processor that Bill prefers’  
 b. Japanese  
 Watasi wa sono otoko ga tataita inu o miru.  
 I TOP that man NOM struck dog ACC see  
 ‘I see the dog that the man struck.’  
 c. Maori  
 te taane i patu- a e te wahine  
 the man PST hit- PASS by the woman  
 ‘the man who was hit by the woman’

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<sup>3</sup>All the examples other than the Hebrew come from Keenan and Comrie (1979).

- d. Korean  
 hyənsik- i ki lä- lil ttäli- n maktäki  
 Hyensik- NOM the dog- ACC beat- REL stick  
 ‘the stick with which Hyensik beat the dog’
- e. Persian  
 John mard- i râ ke zan zad mišenâsad.  
 John man- the ACC COMP woman hit knows  
 ‘John knows the man who the woman hit.’
- f. Swedish  
 Jag har en bror, som talar tyska.  
 I have a brother REL speaks German  
 ‘I have a brother who speaks German.’
- g. Yoruba  
 iṣu ti mo ra lana naa  
 yam REL I buy yesterday that  
 ‘that yam that I bought yesterday’

In fact, as shown by Maxwell (1979) for the 49 languages in the database of Keenan and Comrie (1979), languages with pronoun-less relative clause constructions are quite common. In some languages, such as Toba Batak and Japanese, these are the only kind of relative clause, while in others, such as Spanish and Czech, relative-pronoun relatives also exist.

The cross-linguistic distribution of relative-pronoun-less relative clauses is significant. If a mediated analysis were the right analysis of relative clauses, relative-pronoun-less constructions would be at best a highly marked construction. The fact that they are more common cross-linguistically than relative-pronoun relative clauses indicates that an unmediated analysis is called for.

### 3. Earlier Arguments Revisited

While mediated analyses of relative clauses are much more common in the literature, unmediated analyses have appeared as well. The alternative analysis in transformational theory is what is generally referred to as the raising analysis. The first appearance of this analysis in the literature is Schachter (1973: 31–35), who proposed the following underlying structure for relatives (where  $\Delta$  indicates an empty position,  $e$  in more modern notation):

$$(12) \text{Nom}[_{\text{Nom}}[\Delta] \text{S}]$$

The relativized NP then raises from the S into the empty position in the structure.

The unmediated analysis (under the guise of the raising analysis) was developed in Vergnaud (1974), and has been revived by Kayne (1994). While

various arguments have been given over the years for an unmediated analysis, the most compelling one comes from the behavior of idiom chunks, as in the following examples from Hulsey and Sauerland (2006: 114).

- (13) a. Mary praised the headway that John made.  
 b. I was shocked by the advantage that she took of her mother.

Vergnaud (1974: 57) provides a similar example from French, using the French equivalent of the idiom *take part in*.

- (14) Il est surpris de la part que Jean a prise aux débats.  
 he is surprised of the part that John has taken at the debates  
 'He is surprised at the part that John took in the debates.'

In anybody's theory of idioms, idiom chunks like *headway*, *advantage*, and *part* are licensed by being the object of *make*, *take*, and *prendre*, respectively. Schematically (and abstracting away from specific theoretical frameworks), the mediated analysis provides the following analyses of these sentences (R=relative pronoun):

- (15) a. Mary praised the headway [that John made R]  
 b. I was shocked by the advantage [that she took R of her mother]  
 c. Il est surpris de la part [que Jean a prise R aux débats]

The idiom chunks are not the objects of the licensing verbs in these cases; the relative pronouns are, and the idiom chunks appear in positions in which they are not licensed. This kind of anaphoric relation is not normally possible for idiom chunks:

- (16) a. \*Mary always praises headway when John makes it.  
 b. \*I was shocked by the advantage when I saw her take it of her mother.

Under the unmediated analysis, on the other hand, the idiom chunks are correctly licensed:

- (17) a. Mary praised the *x* [that John made *x*]; *x*=headway  
 b. I was shocked by the *x* [that she took *x* of her mother];  
*x*=advantage  
 c. Il est surpris de la *x* [que Jean a prise *x* aux débats]; *x*=part

This provides a strong argument in favor of the unmediated analysis.

Previous versions of the unmediated analysis have been based on a derivational model of syntax, in which the head is taken to originate in the

relative clause and move to its surface position, as opposed to the non-derivational LFG account proposed here, in which the relativized element serves two functions simultaneously. The idiom chunk facts provide evidence to distinguish the derivational from the non-derivational account. Consider the following example.<sup>4</sup>

- (18) Mary never made the headway that had been expected of her.

In this case, the verb of which *headway* is the surface object is the licensing verb. For a derivational raising analysis, the D-structure is (19a), while for a non-derivational multifunctionality analysis it is (19b).

- (19) a. [Mary never made [the *e* [UNEXPR.SUBJ had been expected headway of her]]]  
 b. Mary never made the *x* [that *x* had been expected of her];  
*x*=headway

The raising analysis provides the wrong account of this case, while the non-derivational multifunctional analysis has *headway* as the object of the licensing verb *made* here as well. The idiom-chunk facts thus provide evidence not only for an unmediated analysis, but for an LFG-style implementation.

A less convincing argument comes from the binding of reflexive anaphors (examples from Hulsey and Sauerland 2006: 115):

- (20) a. I saw the picture of himself that John liked.  
 b. Mary discovered the book about himself that Bob wrote.

In these cases, the DP containing *himself* must be directly associated with the object position inside the relative clause for the coreference to be grammatical; such an association is provided by the unmediated analysis but not by the mediated analysis. On the other hand, if the binding of reflexives in picture noun phrases is not governed by syntactic principles (e.g. if the reflexives in picture NPs are logophors), this argument does not go through.

## 4. The Unmediated Analysis

### 4.1. Basics

On the basis of the old arguments from idiom chunks and anaphoric

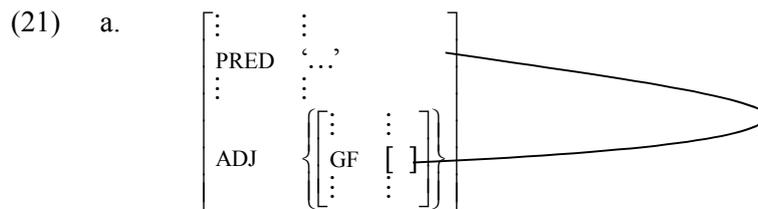
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<sup>4</sup>I would like to thank Joan Bresnan (p.c.) for pointing this example out to me. Bresnan also notes that similar issues arise in pseudoclefts such as the following:

(i) What we have to make is more headway!  
 Here the object of *make* is *what*, not *headway*. I do not have anything to say about this case, as I do not have an analysis of pseudoclefts. It is possible that this should be taken as evidence for the direction that an analysis of pseudoclefts should go.

binding and the new arguments from the in-situ construction and the widespread distribution of relative-pronoun-less relatives, I take it that an unmediated analysis of relative clauses is the correct one. In this section, I will develop the analysis. As will become clear shortly, the analysis is not entirely straightforward, and could be construed as evidence against an unmediated analysis. Given the evidence that has been presented in the previous sections, I would consider this to be a mistake. The evidence for an unmediated analysis is clear; the challenge is to find the right descriptive tools to get the details right.

The core of an unmediated analysis of relative clauses is that the relativized element is a structure-shared element that has two functions: whatever function the nominal phrase has in the larger sentence and its function within the relative clause. (While it is convenient to speak of the head of the construction as the element that has these two functions, it is actually the larger nominal phrase of which the relative clause is an adjunct. The “head” is not an independent element.) In (21b), the structure-sharing functions are SUBJ of *leaves* and OBJ of *booked*.



b. [The trip to Mars that I booked [e] ] leaves on Tuesday.

However, this is not quite accurate. A closer look reveals that the entities that fill the two functions do not have identical content.

The first difference is that the ADJ (i.e. the relative clause itself) is part of the SUBJ of *leaves* but not part of the OBJ of *booked*. The OBJ of *booked* is *trip to Mars*, not *trip to Mars that I booked*. The result is that while we want a direct relation between the larger nominal phrase and the in-clause element, they cannot be identical.

The next problem is case marking. In most languages, the relativized element always has the appropriate case for the position (head or in-clause) in which it is realized in c-structure.<sup>5</sup> There is no requirement that the same case be appropriate for the other position. This is true for both externally headed relatives and internally headed ones. In the case of IHRCs, the relative clause itself can be marked for case.

<sup>5</sup>Other treatments of case are also attested. Culy (1990: 268) discusses Cuzco Quechua case attraction, under which the larger nominal phrase can, for some speakers, be marked with the case of the in-clause element in both internally- and externally-headed relative clauses.

- (22) a. **Hebrew**  
*externally headed*  
*accusative head, nominative in-clause*  
 Kaniti et ha- sefer še hicxik otxa.  
 I.bought ACC DEF- book that made.laugh you  
 ‘I bought the book that made you laugh.’
- b. **Diegueño** (Gorbet 1977)  
*internally headed*  
*inessive head, accusative ( $\emptyset$  suffix) in-clause*  
 Tənay ’wa: ’wu:w- pu- L<sup>y</sup> ’čiyawx.  
 yesterday house I.see- DEF- INESSIVE I.sing.IRR  
 ‘I’ll sing in the house I saw yesterday.’

This is a problem because a single structure-shared element is usually thought to have the same case everywhere. In this construction, however, the entities that bear the two grammatical functions are not completely identical; as we have already seen, one of them includes the relative clause and the other does not. It is thus not a completely structure-shared element. I hypothesize that the lack of complete identity allows the lack of case connectivity.

The most important element that is not shared is the DEF feature. This is not overtly visible in the case of externally headed relatives, as there is a gap in the position in the relative clause, and thus no overt marking of DEF. However, IHRCs, in which the construction and the internal head can be independently marked for a DEF value, clearly show that the head (or rather, the larger nominal phrase) and the in-clause position have different values.

Perhaps the most common pattern is that there is DEF marking on the larger nominal phrase but not on the internal head. This can be seen in the Diegueño example (22) above. Further examples are the following.

- (23) Dogon<sup>6</sup> (Culy 1990: 20)  
 Iye kekeGINE ya yaana poñ lagɔ agiya.  
 today crazy.person yesterday woman large.OBJ hit.DEF caught.3PL  
 ‘Today they caught the crazy person who hit a large woman.’
- (24) Tibetan (Keenan 1985: 161)  
 Peeme thep khii- pa the nee yin.  
 Peem.ERG book.ABS carry- PART the.ABS I.GEN be  
 ‘The book Peem carried is mine.’

Since all nominal elements other than case appear on the internal head and not on the larger nominal phrase, this raises the suspicion that the DEF is specifically a property of the larger nominal phrase and not of the internal head.

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<sup>6</sup>In this example, the determiner *gɔ* cliticizes onto the verb form *lagi*.

Other languages have a determiner marking a DEF value on the internal head that does not express the definiteness of the larger nominal phrase. In Bambara, there normally are no determiners, but there is a special determiner marking the internal relative head.

- (25) Bambara (Keenan 1985: 162)  
 Tye ye ne ye so min ye san.  
 man PST I PST horse REL see buy  
 ‘The man bought the horse which I saw.’

This suggests that there is a special [DEF REL] value for the clause-internal element. More striking are languages like Lakhota and Mooré, in which two determiners are in evidence, one for the larger nominal phrase, and another one (indefinite) marking the internal head.

- (26) Lakhota (Williamson 1987: 171)  
 a. Mary owiža wə kaḡe ki he ophewathu.  
 Mary quilt a make the DEM I.buy  
 ‘I bought the quilt that Mary made.’  
 b. Mary owiža wə kaḡa cha he ophewathu.  
 Mary quilt a make INDEF DEM I.buy  
 ‘I bought a quilt that Mary made.’  
 c. \*Mary owiža ki kaḡe ki he ophewathu.  
 Mary quilt the make the DEM I.buy  
 ‘I bought the quilt that Mary made.’

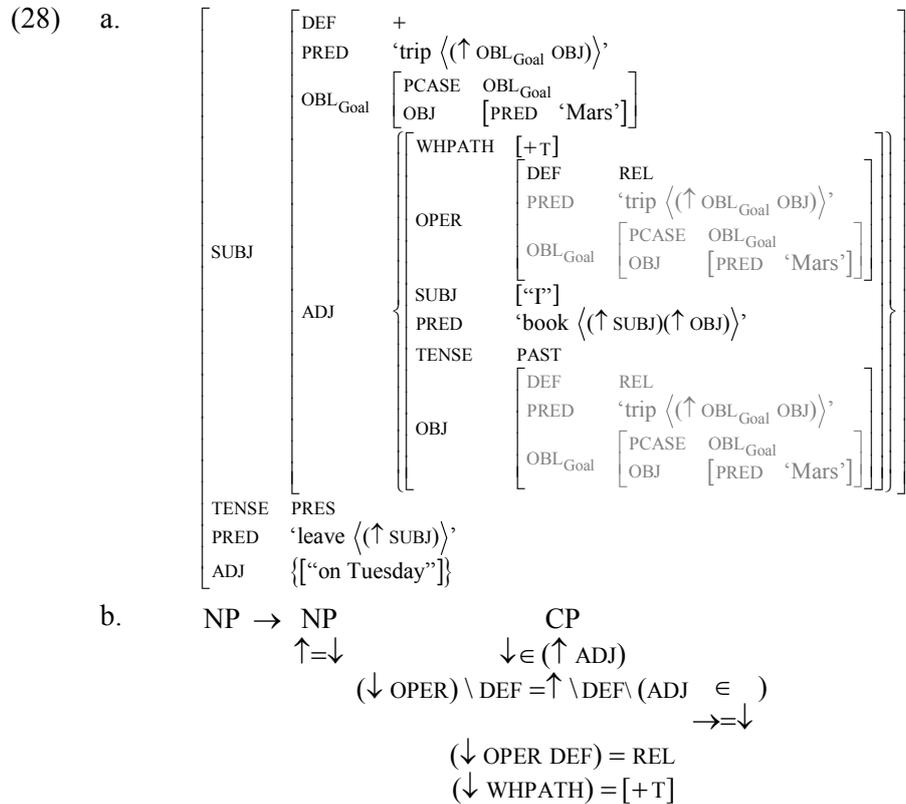
- (27) Mooré (Culy 1990: 76)  
 Yāmb sēn yā dao ninga zamē wā bee ka.  
 2PL AUX saw man INDEF yesterday DEF be there  
 ‘The man that you saw yesterday is here.’

Williamson (1987) argues that the indefinite marking on the internal head is semantically motivated.

From the syntactic perspective, then, the in-clause element, although the same entity as the larger nominal phrase, is not feature-identical to it. This means that the analysis of relative clauses, although unmediated, will not involve a simple structure-sharing. Instead, the relative clause must contain a modified version of the larger nominal phrase. The functional equation licensing relative clauses specifies that the DEF value of the larger nominal phrase is replaced by the special REL value. This modified version lacks the relative clause adjunct and gets its own case-marking. These are the only differences between the two functional positions.

Expressing this formally presents some challenges. In the first place, we need to be able to selectively exclude features from one or more functions. This can be achieved formally through the use of the restriction operator (Kaplan and

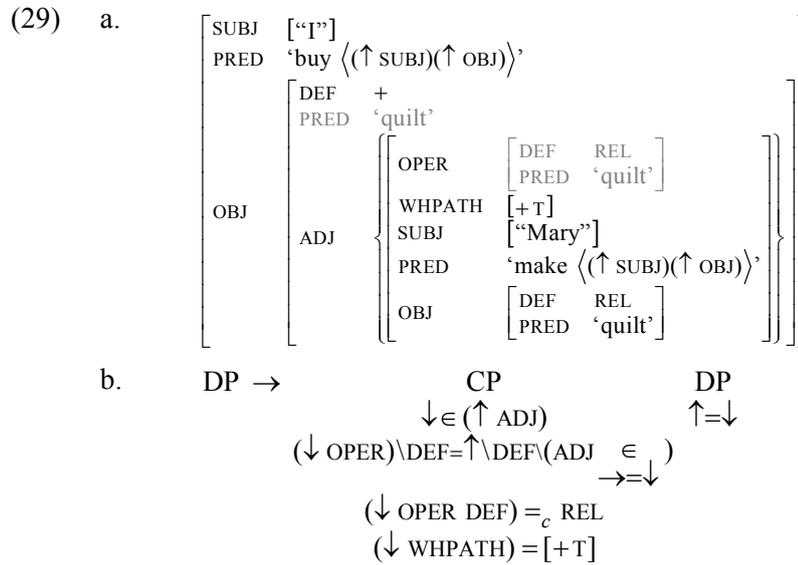
Wedekind 1993), which will exclude the sharing of DEF and ADJ.<sup>7</sup> The other problem is correctly incorporating the restriction operator in an equation relating the larger element to an arbitrary in-clause function. This difficulty is compounded in those varieties of LFG which use inside-out functional uncertainty proceeding from the position of the in-clause function (inter alia Bresnan 1995, Falk 2007). My proposal is that the information flow between the larger nominal and the in-clause function is mediated by an OPERATOR (or OPER)<sup>8</sup> at the root of the relative clause. The f-structure of the English sentence (21b) with an externally headed relative clause is (28a), and the phrase structure rule required is (28b). For clarity, the shared elements are shown in normal type in the f-structure position associated with the c-structure position in which they actually occur, and grayed-out in other f-structure positions. This notation replaces the usual curved line.



<sup>7</sup>And CASE, if it is an f-structure feature. For a contrary view of case, see Falk (2006).

<sup>8</sup>The name OPER is used in Falk (2001). Other names have been used in the LFG literature, such as Q for interrogative operators and RELPRO for relative operators in Kaplan and Bresnan (1982) and Dalrymple (2001).

Similarly, the Lakhota example (26a) will have the following f-structure.



The f-structures are almost identical.<sup>9</sup>

OPER serves as an intermediate step in the flow of information between the in-clause and out-of-clause portions of the relative clause construction. It does not turn this into a mediated analysis in the sense defined here: the operator is not a pronominal element which is coreferential with the head. There is no anaphoric mediation, and the relation between the head and the in-clause position remains direct and unmediated. While OPER is being proposed here as a formal convenience, it will transpire (in §5) that it has syntactic consequences.

#### 4.2. Internally-headed relative clauses in Choctaw

IHRCs in Choctaw are discussed by Broadwell (1985a, 1985b). Choctaw IHRCs differ from relative clauses in other languages in two important ways: they do not constitute islands for *wh* extraction, and they are marked by switch reference markers.

- (30) a.
- |        |        |       |           |      |        |        |     |
|--------|--------|-------|-----------|------|--------|--------|-----|
| Joyce- | at     | John- | at        | ofi  | aaipa  | nota-  | ma  |
| Joyce- | NOM    | John- | NOM       | dog  | table  | under- | ACC |
| aa-    | piisa- | tok-  | ma        |      | chopa- | tok.   |     |
| LOC-   | see-   | PST-  | DIFF.SUBJ | buy- | PST    |        |     |
- ‘Joyce bought the dog John saw under the table.’ or  
‘Joyce bought the table John saw the dog under.’

<sup>9</sup>The f-structures and phrase structure rule annotations include the feature [WHPATH], motivated by Falk (2009). The proposal there is that a *wh* path is delimited by values of this feature, with the top f-structure bearing the value [+T] (for *top*) and others bearing the value [-T].

- b. Katommah Joyce- at John- at ofi  
 where Joyce- NOM John- NOM dog  
 aa- p̄isa- tok- mā chopā- tok.  
 LOC- see- PST- DIFF.SUBJ buy- PST  
 ‘Where did Joyce buy the dog John saw.’ (i.e. where did John see it?)

While this is not the place for a complete analysis of the Choctaw construction, Broadwell’s basic conclusion seems well-founded. Broadwell analyzes Choctaw relatives as being clauses rather than nominal phrases. The presence of clausal marking (switch reference) rather than nominal marking (definiteness, case, nominalizing suffix) supports such an analysis. Sentence (30a) would be more accurately rendered:

- (31) Joyce bought [John saw the dog under the table].

In more conventionally structured languages, like English, this would not be grammatical. Presumably the syntax-semantics mapping in Choctaw allows such sentences to be interpreted.

If this analysis is correct, Choctaw IHRCs are not *wh* constructions; this could be the reason for their non-islandhood. In Falk (2009), it is proposed that in-situ constructions in some languages are not *wh* constructions. That proposal was based on in-situ questions, but since IHRCs are in-situ constructions as well, it stands to reason that non-*wh* IHRCs also exist. Choctaw thus fills a typological gap.

## 5. Relative clauses with relative pronouns

We return now to the form of relative clause which the standard mediated analysis takes to be the basic form: the one with a relative pronoun. All the evidence for an unmediated analysis of relatives without relative pronouns points to an unmediated analysis even when a relative pronoun is present.

- (32) a. Mary praised the headway which John made.  
 b. I was shocked by the advantage which she took of her mother.  
 (33) a. I saw the picture of himself which John liked.  
 b. Mary discovered the book about himself which Bob wrote.

In other words, contrary to the conventional wisdom, the relative “pronoun” is not a pronominal element which is coreferential with the head and mediates the relation between the head and the in-clause position.

If the relative pronoun is not truly pronominal, the question arises as to why relative pronoun constructions exist. To answer the question, consider the

distribution of relative constructions in English non-finite clauses.

- (34) a. a word processor [(*\*which*) to mangle the text]  
 b. a word processor [(*\*which*) to hate with a passion]  
 c. a word processor [(*\*which*) to crash the computer with]  
 d. a word processor [with which to crash the computer]

In infinitival relatives in English, relative pronouns are restricted to “pied-piping” contexts. If there is no pied-piping (relativizing subjects, objects, or even obliques with preposition stranding) the relative pronoun is not allowed.

The pattern that we find in English infinitival relatives can also be found in other languages. For example, the variety of Norwegian described by Taraldsen (1978) has relative clauses with and without relative pronouns.

- (35) a. Mannen som / \*hvilken ser urolig på oss, er sikkert  
 the.man REL / *\*which* see uneasily at us is surely  
 svensk.  
 Swede  
 ‘The man that/who is looking uneasily at us is surely a Swede.’  
 b. Mannen som / \*hvilken du ser der borte, må  
 the.man REL / *\*which* you see there away must  
 komme fra Sverige.  
 come from Sweden  
 ‘The man you see over there must come from Sweden.’  
 c. Mannen som / \*hvilken du snakker om, ser nervøs ut.  
 the.man REL / *\*which* you speak about sees nervous out  
 ‘The man that you are talking about looks nervous.’  
 d. Mannen om hvilken du snakker, ser nervøs ut.  
 the.man about which you speak sees nervous out  
 ‘The man about whom you are talking looks nervous.’

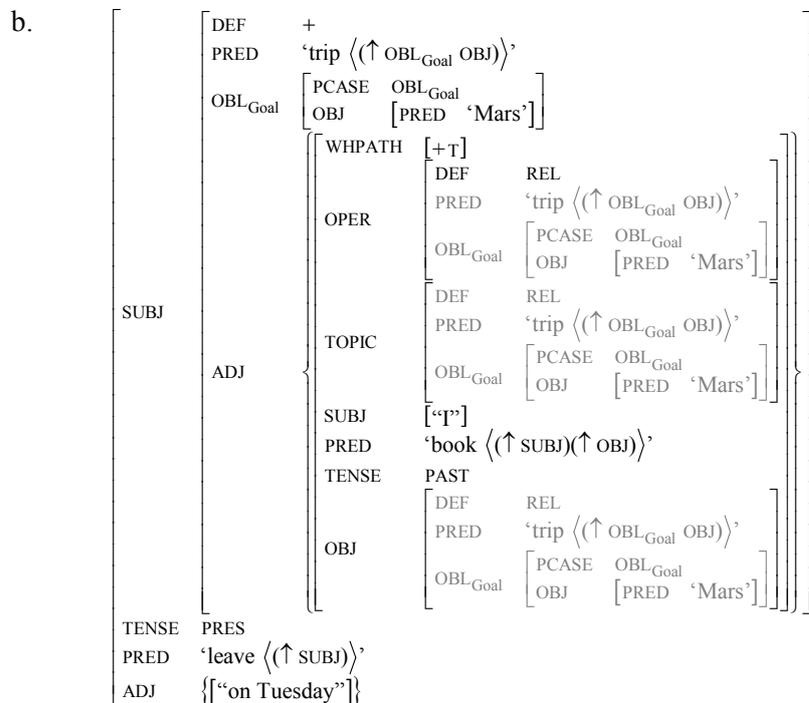
Several of the languages surveyed by Maxwell (1979) display the same distribution: relative pronouns are only used in constructions involving pied piping. There thus appears to be a relationship between relative pronouns and pied-piping.

*Wh* relatives are licensed by the same phrase structure rule that licenses *wh* questions. Following Falk (2001), this is:

- (36) CP → 
$$\begin{array}{ccc} & \text{XP} & \text{C}' \\ & (\uparrow \text{DF}) = \downarrow & \uparrow = \downarrow \\ & (\uparrow \text{OPER}) = \downarrow & \\ (\uparrow \text{OPER PRONTYPE}) =_c \text{WH} & & \end{array}$$

Under the analysis proposed in this paper, relative clauses have an OPER (usually unexpressed). Nothing that has been said prevents this operator from being expressed overtly as a *wh* element.<sup>10</sup> If it is, (36) will specify that it has a discourse-related function (topic in the case of relative clauses). Since, unlike interrogative operators, the relative operator is not referential, the lexicon of the language needs to provide lexical *wh* elements that are not referential, but otherwise all the elements are already present to allow *wh* relatives. This results in the following:

(37) a. The trip to Mars which I booked leaves on Tuesday.



Here the relativized element bears an extra grammatical function, the grammaticized discourse function TOPIC. Pied-piping in *wh* questions is standardly licensed by dissociating the discourse function and the OPER

<sup>10</sup>The discussion here assumes that relative pronouns are always *wh* elements, i.e. related to interrogatives. They are obviously not always identical to interrogatives: English *which* as a relative pronoun has different properties than *which* as an interrogative. It has been argued (Vaillette 2000, Falk 2002) that Modern Hebrew has relative pronouns which are identical to anaphoric pronouns. Nothing prevents lexical items that are identical to anaphoric pronouns from having a *wh* feature, although this appears to be unusual. The Hebrew construction may have developed from a resumptive pronoun construction.

function:

$$(38) \quad CP \rightarrow \begin{array}{ccc} & XP & C' \\ & (\uparrow DF) = \downarrow & \uparrow = \downarrow \\ & (\uparrow OPER) = (\downarrow GF^*) & \\ (\uparrow OPER PRONTYPE) =_c WH & & \end{array}$$

It is the existence of two grammatical functions, the DF and OPER, that allows for pied piping.

It should be noted that under this analysis, the existence of *wh* relatives is a consequence of the operator element proposed for relative clauses. While the operator in non-*wh* relatives is an abstract element with no overt realization, an operator can be included in a fronted *wh* phrase. The operator in relative clauses was originally proposed as a formal necessity, a way of expressing the relation between the head and the in-clause function; the fact that its existence is exploited to allow for relative-pronoun relative clauses is a fortuitous piece of evidence confirming the analysis.

## 6. Conclusion

It has been argued in this paper that relative clauses should be analyzed without a mediating relative pronoun. Such an analysis accounts for the existence of IHRCs as the in-situ variety of the construction, and for the widespread occurrence of relative clauses with no relative pronoun. The use of a relative pronoun is made available as a result of the formal properties of the construction, but the relative pronoun is not a true pronoun. The purpose of the relative pronoun is to make the construction more flexible by allowing pied-piping constructions. We have also seen that non-*wh* construction relative clauses exist; in particular, Choctaw fills a typological gap by having in-situ relative clauses in which there is no syntactic link with the head of the relative clause construction.

This analysis of relative clauses raises some interesting questions for LFG. One of them relates to the OPER function. It is not clear how OPER fits into the general LFG set of grammatical functions. While it is clearly related to the grammaticized discourse functions, it appears to be somewhat different from them.

Another question relates to the lack of case connectivity in relative clauses. This lack of case connectivity has some interesting parallels in the LFG literature, which includes other constructions with elements which appear to be related through structure-sharing but do not have the same case. For example, Asudeh (2004: 129) argues against a structure-sharing analysis of resumptive pronouns (as proposed by Falk 2002) in part on the grounds of lack of case connectivity. Similarly, Dalrymple and King (2000: 90) argue that the relationship between the SUBJ of a *tough* predicate and the element in the

subordinate clause in a *tough* construction cannot be one of structure sharing because the two elements have different cases. In both of these cases, an anaphoric analysis is proposed instead. In the present situation, this would be unfortunate; as we have seen, the evidence is for an unmediated analysis, not one with a relative pronoun. However, since (unlike Icelandic raising constructions discussed by Andrews 1982) the shared structures are not identical in relative clauses, there is no reason to expect the case to be identical. It can either be explicitly excluded (with the restriction operator), or we can adopt the proposal of Falk (2006). Under this proposal, case is not an f-structure feature value. Instead, every argument-taking predicate projects a grammatical-marking structure (g-structure), where case is realized in the form of an attribute that takes the argument as its value. Since the head and the in-clause element are not identical, they are distinct f-structure elements and would project distinct g-structures. I leave this question open here. I also leave open the question of whether the solution for relative clauses will also work for resumptive pronouns (in relative clauses) and *tough* constructions. In any case, lack of case connectivity is a weaker argument for an anaphoric analysis than it has generally been thought to be.

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