

# Resumptive Pronouns: At the Interface between Syntax, Form and Meaning\*

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## 1 Introduction

- *Generative linguistics* has lately focused much attention on *linguistic interfaces*.
  - *Generative linguistics* is here taken to include any theory that seeks to account for the uncontroversial cognitive phenomenon of linguistic productivity with a set of explicit formal mechanisms that characterize a finitely specifiable computational device, the language faculty.
  - *Linguistic interfaces* are here taken to be the points of contact between subsystems within the language faculty or between systems of the language faculty and language-external cognitive systems.
- I want to talk today about interfaces, setting as much theory-specific baggage and jargon as possible aside, focusing on what I take to be the primary interfaces in a minimal theory of language.
  - What is language minimally? It is a structured (syntax) mapping between form (phonetics–phonology) and meaning (semantics–pragmatics).
  - Therefore the primary interfaces are the **syntax–phonology** and **syntax–semantics** interfaces.
- Today I hope to show that *resumptive pronouns* are a perfect phenomenon for studying these two major interfaces.

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- Resumptive pronouns are a common cross-linguistic strategy for realizing the base of an unbounded dependency.

- (1) an ghirseach a-r ghoid na síogaí í Irish  
 the girl COMP-PAST stole the fairies her  
 ‘the girl that the fairies stole away’  
 (McCloskey 2002: 189)
- (2) ra?iti ?et ha-yeled she/?asher rina ?ohevet ?oto Hebrew  
 saw.I ACC the-boy COMP/COMP Rina loves him  
 ‘I saw the boy that Rina loves.’  
 (Borer 1984: 220)
- (3) Vilket ord visste ingen hur många *M* det stavas med? Swedish  
 which word knew nobody how many *Ms* it is.spelled with  
 ‘Which word did nobody know how many *Ms* (it) is spelled with?’  
 (Engdahl 1985: 8)

## 2 Main Goals

- The analysis of resumption offers two fundamental *opposing* analytic choices:
  1. Resumptive pronouns are underlyingly traces/copies/gaps: Why then do they have the same **form** as ordinary pronouns?  
 ⇒ **Complication at the syntax–phonology interface**
  2. Resumptive pronouns are not underlyingly traces/copies/gaps: Why then do they not saturate argument positions, i.e contribute differently to **interpretation** than ordinary pronouns?  
 ⇒ **Complication at the syntax–semantics interface**
- **Main goals:**
  1. To argue that there are two kinds of resumptives, which I call *syntactically active resumptives* (SARs; e.g., Irish) and *syntactically inactive resumptives* (SIRs; e.g., Swedish)
  2. To argue that these can nevertheless be handled in a unified manner at the syntax–semantics interface
  3. To argue that the best theory of resumption is the kind in which the complication we face and solve is the one at the syntax–semantics interface

## 3 Overview of the Talk

- |                                  |                                    |
|----------------------------------|------------------------------------|
| 1. Introduction                  | 6. Informal Analysis               |
| 2. Main Goals                    | 7. An Alternative Kind of Analysis |
| 3. This                          | 8. Conclusion                      |
| 4. Empirical Background and Data | 9. Appendix: Formal Details        |
| 5. Theoretical Background        |                                    |

## 4 Empirical Background and Data

### 4.1 Two Kinds of Grammatically Licensed Resumption

#### 1. Syntactically active resumptives (SARs)

**Do not** display gap-like properties

Sample languages: Irish, Hebrew, Lebanese Arabic, ...

- (4) an ghirseach a-r ghoid na síogaí í  
 the girl COMP-PAST stole the fairies her  
 ‘the girl that the fairies stole away’

#### 2. Syntactically inactive resumptives (SIRs)

**Do** display gap-like properties.

Sample languages: Swedish, Vata, Lebanese Arabic, ...

- (5) [Vilket ord]<sub>i</sub> visste ingen [<sub>CP</sub> [hur många *M*]<sub>j</sub> [<sub>C'</sub> det<sub>i</sub> stavas med —]<sub>j</sub>]?  
 which word knew nobody how many *M*s it is.spelled with —

‘Which word did nobody know how many *M*s (it) is spelled with?’  
 (Engdahl 1985: 8)

- (6) àlós ù lē sáká lá  
 who he eat rice *wh*  
 ‘Who is eating rice?’

	Syntactically Active RPs	Syntactically Inactive RPs
Grammatically Licensed	Yes	Yes
Island-Sensitive	No	Yes
Weak Crossover Violation	No	Yes
Reconstruction Licensed	No	Yes
ATB Extraction Licensed	No	Yes
Parasitic Gap Licensed	No	Yes
Non-Specific/ <i>De Dicto</i> Interpretation	No	No
Pair-List Answers	No	No

Table 1: Some properties of SARs and SIRs

- Syntactic representation of SARs and SIRs (English used purely for exposition)<sup>1</sup>

Target: [*Who did Jane see him?*]

RP is syntactically active

RP is syntactically inactive

[	PRED	‘see⟨SUBJ,OBJ⟩’	[	PRED	‘see⟨SUBJ,OBJ⟩’	]
UDF	[	PRED	‘pro’	[	PRED	‘pro’
	PRONTYPE	Q	UDF	PERSON	3	
SUBJ	[	PRED	‘Jane’	NUMBER	SG	
	[	PRED	‘pro’	GENDER	MASC	
OBJ	PERSON	3	SUBJ	[	PRED	‘Jane’
	NUMBER	SG	OBJ	—		
	GENDER	MASC	]			
]			]			

<sup>1</sup>The particular syntactic theory assumed here is Lexical-Functional Grammar (Kaplan and Bresnan 1982, Bresnan 2001, Dalrymple 2001, Bresnan et al. 2015), but the equivalent distinction should be possible in other frameworks. See Appendix A for a very brief overview of LFG.

## 4.2 Irish

- The simplest generalization about resumptive pronouns in Irish is that they occur in any syntactic position in any unbounded dependency, except where blocked by independent constraints.
- The key independent constraint is the Highest Subject Restriction

### (7) Highest Subject Restriction

- a. \* an fear a raibh sé breoite (McCloskey 1990: 210, (29a))  
 the man COMP be.PAST he ill  
 ‘the man that (he) was ill’
- b. \* na daoine a rabhadar breoite (McCloskey 1990: 210, (29b))  
 the people COMP be.PAST.3PL ill  
 ‘the people that (they) were ill’
- c. cúpla muirear a bhféadfaí a rá go rabhadar bocht  
 a.few families COMP one.could say.INF COMP be.PAST.3PL poor  
 ‘a few families that one could say (they) were poor’  
 (McCloskey 1990: 210, (30b))

- Other than this restriction, Irish resumptives occur in a wide variety of unbounded dependency constructions:

### (8) Restrictive relative clauses

- a. an ghirseach a-r ghoid na síogaí í  
 the girl COMP-PAST stole the fairies her  
 ‘the girl that the fairies stole away’  
 (McCloskey 2002: 189, (9b))
- b. an fear a dtabharann tú an tairgead dó  
 the man COMP give you the money to.him  
 ‘the man to whom you give the money’  
 (McCloskey 1979: 6, (3))

### (9) Nonrestrictive relative clauses

Tháinig an saighdiúir eile, nach bhfaca mé roimhe é, aníos chugainn.  
 came the soldier other NEG.COMP saw I before him, up to.us  
 ‘The other soldier, whom I hadn’t seen before, came up to us.’  
 (McCloskey 1990: 238, (97a))

### (10) Questions

- a. Céacu ceann a bhfuil dúil agat ann?  
 which one COMP is liking at.you in.it  
 ‘Which one do you like?’  
 (McCloskey 2002: 189, (10b))
- b. d’inis siad cén turas a raibh siad air  
 told they what journey COMP be.PAST they on.3SG.MASC  
 ‘they told what journey they were on (it)’  
 (McCloskey 1990: 238, (98a))

(11) **Clefts**

Is tú a bhfuil an deallramh maith ort.  
 COP.PRES you COMP is the appearance good on.2SG  
 ‘It is you that looks well.’  
 (McCloskey 1990: 239, (99a))

(12) **Reduced Clefts**

Teach beag seascair a-r mhair muid ann.  
 house little snug COMP-PAST lived we in.it  
 ‘It was a snug little house that we lived in.’  
 (McCloskey 2002: 189, (11b))

(13) **Comparatives**

Do fuair sé leaba chó math agus a-r lui sé riamh uirthi.  
 get PAST he bed as good as COMP lie.PAST he ever on.3SG.FEM  
 ‘He got a bed as good as he ever lay on (it).’  
 (McCloskey 1990: 239, (100b))

- Gaps in Irish are island-sensitive.

(14) **Complex NP Islands**

- a. \* an fear aL phóg mé an bhean aL phós  
 the man COMP kissed I the woman COMP married  
 ‘the man who I kissed the woman who married’  
 (McCloskey 1979: 30, (78))
- b. \* Cén fear aL phóg tú an bhean aL phós?  
 which man COMP kissed you the woman COMP married  
 ‘Which man did you kiss the woman who married?’  
 (McCloskey 1979: 30, (80))

(15) **Wh-Islands**

- a. \* fear nachN bhfuil fhios agam cén cineál mná aL phósfadh  
 a man COMP.NEG I know what sort of a woman COMP would marry  
 ‘a man who I don’t know what woman would marry’  
 (McCloskey 1979: 32, (87))
- b. \* Cén sagart nachN bhfuil fhios agat caidé aL dúirt?  
 which priest COMP.NEG you know what COMP said  
 ‘Which priest don’t you know what said?’  
 (McCloskey 1979: 32, (88))
- c. \* Cén sagart aL d’fhiafraigh Seán diot arL bhuail tú?  
 which priest COMP asked John of you QUEST  
 ‘Which priest did John ask you if you hit?’  
 (McCloskey 1979: 32, (89))

- Irish resumptives are not island-sensitive.

(16) **Complex NP Island**

Sin teanga aN mbeadh meas agam ar duine ar bith aL tá ábalta i a labhairt  
 that a.language COMP would be respect at me on person any COMP is able it to speak  
 ‘That’s a language that I would respect anyone who could speak it.’  
 (McCloskey 1979: 34, (95))

(17) **Wh-Island**

Sin fear nachN bhfuil fhios agam cén cineál mná aL phósfadh é  
 that a man COMP.NEG I know what sort of a woman COMP would marry him  
 ‘That’s a man who I don’t know what kind of woman would marry him.’  
 (McCloskey 1979: 33, (91))

- Gaps in Irish are subject to weak crossover effects:

- (18) a. \* fear a d’fhág a bhean \_\_ (McCloskey 1990: 237, (95a–b))  
 man COMP left his wife  
 ‘a man that his wife left’
- b. \* an fear so a mhairbh a bhean féin \_\_  
 this man COMP killed his own wife  
 ‘this man that his own wife killed’

- Resumptive pronouns in Irish are not subject to weak crossover effects:

- (19) a. fear ar fhág a bhean é (McCloskey 1990: 236–7, (94a–b))  
 man COMP left his wife him  
 ‘a man that his wife left’
- b. an fear so ar mhairbh a bhean féin é  
 this man COMP killed his own wife him  
 ‘this man that his own wife killed’

### 4.3 Swedish

- In *Rikssvenska* — the Swedish spoken in Sweden as opposed to on mainland Finland or the Åland Islands — resumptive pronouns are obligatory following overt material in the left periphery of CP (Engdahl 1982).

(20) **Left-peripheral *wh*-phrase**

[Vilket ord]<sub>i</sub> visste ingen [<sub>CP</sub> [hur många *M*]<sub>j</sub> [<sub>C'</sub> det<sub>i</sub> stavas med \_\_\_]<sub>j</sub>]?  
 which word knew nobody how many *M*s it is.spelled with \_\_\_

‘Which word did nobody know how many *M*s (it) is spelled with?’  
 (Engdahl 1985: 8, ~(11))

(21) **Complementizer**

a. [Vilket ord]<sub>i</sub> visste ingen [<sub>CP</sub> [<sub>C'</sub> om det<sub>i</sub> stavas med ett *M*]]?  
 which word knew nobody if it is.spelled with an *M*

‘Which word did nobody know if (it) is spelled with an *M*?’  
 (Engdahl 1985: 8, ~(11))

b. [Vilken elev]<sub>i</sub> trodde ingen att han<sub>i</sub> skulle fuska?  
 which student thought no one that he would cheat

‘Which student did no one think that (he) would cheat?’  
 (Engdahl 1982: 166, ~(65c))

Grammatically Licensed	Yes
Island-Sensitive	Yes
Weak Crossover Violation	%
Licenses Reconstruction	No
Licenses ATB Extraction	Yes
Licenses Parasitic Gaps	Yes

Table 2: Some properties of Swedish resumptives

- Swedish resumptive pronouns allow Across the Board Extraction.

(22) Där borta går en man som jag ofta träffar \_\_\_ men inte minns vad han heter.  
 There goes a man that I often meet \_\_\_ but not remember what he is called  
 ‘There goes a man that I often meet but don’t remember what he is called.’  
 (Zaenen et al. 1981: 681, (9))

- Swedish resumptive pronouns license parasitic gaps.

(23) Det var den fången<sub>i</sub> som läkarna inte kunde avgöra om han<sub>i</sub> verkligen var sjuk utan  
 it was that prisoner that the.doctors not could decide if he really was ill without  
 att tala med p<sub>i</sub> personligen.  
 to talk with \_\_\_ in person  
 ‘(This is the prisoner that the doctors couldn’t determine if he really was ill without talking  
 to in person.)’  
 (Engdahl 1985: 7, (8))

- Weak crossover judgements are subtle, as usual, but some speakers allow weak crossover with resumptives while others do not:

- (24) % Vilken elev<sub>i</sub> undrar hans<sub>i</sub> lärare om han<sub>i</sub> fuskar?  
 which student wonders his teacher if he cheats  
 ‘Which student does his teacher wonder if (he) cheats?’
- (25) % Vilken elev<sub>i</sub> undrar hans<sub>i</sub> lärare varför han<sub>i</sub> fuskar?  
 which student wonders his teacher why he cheats  
 ‘Which student does his teacher wonder why (he) cheats?’
- (26) % Jag känner en elev som hennes lärare undrar om hon fuskar.  
 I know a student that her teacher wonders if she cheats  
 ‘I know a student who her teacher wonders if (she) cheats.’

- Swedish is generally quite permissive about extraction from islands, except for left-branch islands and subject islands (Engdahl 1982, 1997).
- Engdahl (1985: 10) notes that island violations that are judged to be ungrammatical are not improved by resumptives. In fact, Engdahl (1985) mentions that the example is judged as worse with a resumptive than with a gap.

- (27) ?\* Vilken bil<sub>j</sub> åt du lunch med [<sub>NP</sub> någon<sub>i</sub> [<sub>S'</sub> som  $t_i$  körde  $t_j$ /\* den?  
 which car ate you lunch with someone that drove  /\* it  
 ‘Which car did you have lunch with someone who drove it?’  
 (Engdahl 1985: 10, (16))

- However, this resumptive is not a true grammatically licensed resumptive, since it is not a subject that occurs after left-peripheral material in CP.
- Swedish resumptive pronouns do not support non-specific/*de dicto* readings (Doron 1982).

- (28) Kalle letar efter en bok som han inte vet hur den slutar.  
 Kalle looks for a book that he not knows how it ends  
 ‘Kalle is looking for a book that he does not know how (it) ends.’

- In contrast, a gap does support a non-specific reading.

- (29) Kalle kommer att hitta boken som han letar efter \_\_\_\_.  
 Kalle comes to find book.DEF that he looks for \_\_\_\_  
 ‘Kalle will find the book that he is looking for.’

- *Ålandssvenska* (the dialect of Swedish spoken on the Åland Islands, Finland): allows gaps in post-*wh*-phrase subject positions and the minimal pair to (28) with a gap allows both non-specific and specific readings.

- (30) Kalle letar efter en bok som han inte vet hur \_\_\_\_ slutar.  
 Kalle looks for a book that he not knows how \_\_\_\_ ends  
 ‘(Kalle is looking for a book that he does not know how ends.)’



- Swedish resumptive pronouns do not support pair-list answers to functional questions.

- (31) Vilken elev undrar varje lärare om han fuskar?  
Which student wonders every teacher if he cheats  
'Which student does every teacher wonder if (he) cheats?'
- Pelle
  - Hans mest begåvada elev  
*His most gifted student*
  - \*Andersson, Alfons; Boberg, Benny; Cornelius, Conny

- In contrast, a gap does support a pair-list answer.

- (32) Vilken elev tror varje lärare \_ fuskar?  
Which student tror every teacher \_ cheats  
'Which student does every teacher think cheats?'
- Pelle
  - Hans mest begåvade elev  
*His most gifted student*
  - Andersson, Alfons; Boberg, Benny; Cornelius, Conny

- A post-complementizer gap in *Ålandsvenska* allows all three answers:

- (33) Vilken elev undrar varje lärare om \_ fuskar?  
Which student wonders every teacher if \_ cheats  
'Which student does every teacher wonder if (he) cheats?'
- Pelle
  - Hans mest begåvade elev  
*His most gifted student*
  - Andersson, Alfons; Boberg, Benny; Cornelius, Conny

#### 4.4 The Doron–McCloskey Generalization

- Doron (1982) notes that, “resumptive pronouns are syntactically and semantically pronouns and they differ in both these respects from gaps.”
- She also notes that, “One very simple piece of evidence in favor of [her] approach is that languages that make use of resumptive pronouns use the same inventory available to them for other pronouns.” This is an important observation that I enshrine below as ‘The Doron–McCloskey Generalization’.
  - It is important because, if we take this morphosyntactic generalization seriously, it renders implausible certain otherwise tempting analyses of resumptive pronouns as ‘spelled out gaps’ (or whatever way you prefer of picking out this sort of analysis).
  - I return to this issue briefly in section 7.
- Two important semantic differences that Doron identifies between gaps and resumptive pronouns have to do with 1) specificity and 2) weak crossover. With respect to the first of these, she notes that the non-specific or *de dicto* reading is available for a gap, but not for a resumptive, as shown by the following two examples in Hebrew.

- (34) a. dani yimca et ha-iša še hu mexapes  
 Dani will-find ACC the-woman that he seeks
- b. dani yimca et ha-iša še hu mexapes ota  
 Dani will-find ACC the-woman that he seeks her

With respect to weak crossover, she notes that the potential interpretations for gaps and resumptives pronouns differ in the following pair, where the relevant interpretations are informally indicated by coindexation under the normal sort of understanding of what this represents.

- (35) a. ha-iš<sub>1</sub> še im-o\*<sub>1/2</sub> ohevet —<sub>1</sub>.  
 the-man that mother-his loves
- b. ha-iš<sub>1</sub> še im-o<sub>1/2</sub> ohevet oto<sub>1</sub>.  
 the-man that mother-his loves him

- McCloskey (2006: 97) is an updated discussion of this view:<sup>2</sup>

A fundamental question, which has not often been explicitly addressed, but which lies behind much of the discussion is why resumptive elements have the form that they do. That is, resumptive pronouns simply *are* (formally) pronouns. I know of no report of a language that uses a morphologically or lexically distinct series of pronouns in the resumptive function. If we take this observation to be revealing, there can be no syntactic feature which distinguishes resumptive pronouns from ordinary pronouns, and any appeal to such a feature must be construed as, at best, an indication of the limits of understanding. (emphasis in original)

- (36) **The Doron–McCloskey Generalization (DMG)**  
 Resumptive pronouns are ordinary pronouns.

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<sup>2</sup>We should also note that McCloskey made similar observations in unpublished work and presentations that were contemporaneous to Doron (1982).

- Two direct consequences of the DMG are the following:
  1. There can be no underlying lexical/morphological/featural distinction specific to only resumptive pronouns in a language *L*. Any pronoun of *L* that occurs resumptively must also occur in other environments.
  2. There can be no process of syntactic insertion or semantic composition that is specific to only resumptive pronouns in a language *L*. Resumptives of *L* are inserted and composed just as non-resumptive pronouns of *L* are.
- This points to a division of theories of resumption into two kinds:
  - (37) **Ordinary Pronoun Theory (of Resumption):**  
No lexical/morphological/featural/syntactic difference between resumptive pronouns and referential or bound pronouns
  - (38) **Special Pronoun Theory (of Resumption):**  
Some lexical/morphological/featural/syntactic difference between resumptive pronouns and referential or bound pronouns
- What I am arguing for here, as in previous work (Asudeh 2004, 2011, 2012), is an ordinary pronoun theory of resumption.

## 5 Theoretical Background

### 5.1 The Resource Sensitivity Hypothesis and its Consequences

- The Resource Sensitivity Hypothesis (RSH; Asudeh 2004, 2012) stems from the resource-logical perspective on semantic composition in Glue Semantics<sup>3</sup> (among others, Dalrymple et al. 1993, Dalrymple 1999, 2001, Asudeh 2012), which uses the resource logic *linear logic* (Girard 1987) to assemble meanings.

(39) **The Resource Sensitivity Hypothesis (RSH):**  
Natural language is resource-sensitive.

- RSH is equivalent to the claim of Linguistic Resource Sensitivity, which is in turn derived from Logical Resource Sensitivity:

(40) **Logical Resource Sensitivity:**  
In a resource logic, premises in proofs cannot be freely *reused* or *discarded*.

(41) **Linguistic Resource Sensitivity:**  
Natural language is resource-sensitive: elements of combination in grammars cannot be freely *reused* or *discarded*.

- The upshot of RSH is that compositional semantics is constrained by resource accounting, such that component meanings cannot go unused or be reused.
- For example, in the following sentence, the adverb *slowly* contributes a single lexical meaning resource which cannot be used twice to derive the unavailable meaning that the plummeting was also slow.

(42) John rolled over the edge slowly and plummeted to the ground.

- The Resource Sensitivity Hypothesis paves the way to substantial simplification, since the following independent principles can be reduced to resource sensitivity (Asudeh 2012: 110–123):
  1. Bounded Closure
  2. Completeness and Coherence
  3. The Theta Criterion
  4. The Projection Principle
  5. No Vacuous Quantification
  6. The Inclusiveness Condition
  7. Full Interpretation
- Not only does RSH set the ground for eliminating these principles from our theories, it also gives us a deeper understanding of the principles, since they are reduced to the basic combinatoric logic of semantic composition.

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<sup>3</sup>See Appendix B for a very brief overview of Glue Semantics.

## 6 Informal Analysis

### 6.1 The Resource Management Theory of Resumption

- The Resource Management Theory of Resumption (RMTR; Asudeh 2004, 2005, 2012) is based on the following two claims, both of which we have already discussed.
  1. **The Resource Sensitivity Hypothesis (RSH):**  
Natural language is resource-sensitive.
  2. **The Doron–McCloskey Generalization:**  
Resumptive pronouns are ordinary pronouns.
- The logic behind the theory is as follows. If a resumptive pronoun is an ordinary pronoun, then it constitutes a surplus resource. If Resource Sensitivity is to be maintained, then there must be an additional consumer of the pronominal resource present.
- If a resumptive pronoun is surplus to the basic compositional requirements of the sentence in which it occurs, but the sentence is nonetheless grammatical, then RSH entails that there must be a consumer of the resumptive pronoun’s resource.
- The resumptive consumer is a further resource that consumes a pronominal resource. These resources are called *manager resources*, because they manage an otherwise unconsumable pronominal resource.
- Manager resources are motivated by the following considerations (Asudeh 2012):
  1. They enable an analysis of resumptive pronouns that accounts for their syntactic distribution while also capturing their semantics.
  2. They unify the analysis of syntactically heterogeneous resumptives (SARS and SIRs).
  3. They unify the analysis of resumptive pronouns in unbounded dependencies with copy pronouns in copy raising (see, e.g., Asudeh 2012, Asudeh and Toivonen 2012).
 

(43) Harry seems like he enjoys Quidditch.

(44) \*Ron seems like Harry enjoys Quidditch.
- *A resumptive pronoun language has such manager resources in the portion of its lexical inventory or grammar that concerns unbounded dependencies.*
- *A language which does not license resumptive pronouns in unbounded dependencies lacks manager resources in its grammar.*
- See Appendix C for more details on manager resources.

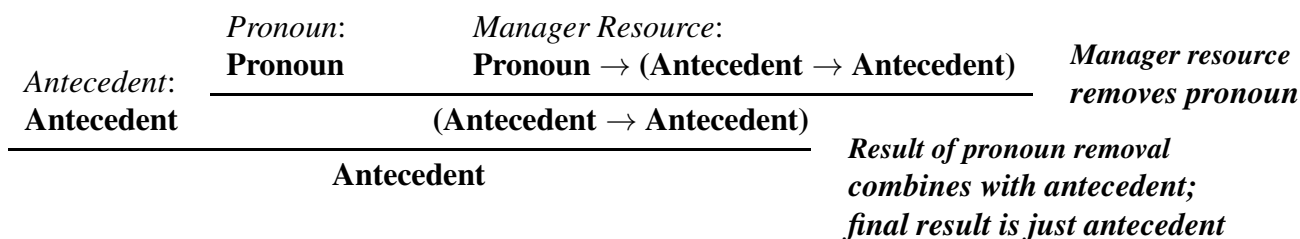


Figure 1: Sketch of manager resource in action

- Syntactically inactive resumptive pronouns require an additional, *syntactic* mechanism to remove the pronoun from syntax.
- In LFG-theoretic terms, this mechanism is *restriction* (Kaplan and Wedekind 1993), which allows removal of specified features from f-structures.

$$(45) \quad (\uparrow \text{UDF}) \setminus \text{PRED} = (\uparrow \text{GF}^* \text{SUBJ}) \setminus \text{PRED}$$

- *Irish and Swedish*<sup>4</sup> equally have manager resources in their lexicons, which allows them to deal with the problem of semantic composition constituted by resumptive pronouns, but Swedish and other languages with syntactically inactive resumptives have an additional mechanism that inactivates the pronoun in the syntax.
- See Appendix D for detailed analyses (fragments) of Irish and Swedish.

Target: [*Who did Jane see him?*]

<i>Syntax</i>	RP is syntactically active	RP is syntactically inactive
	$\left[ \begin{array}{l} \text{PRED} \quad \text{'see'} \langle \text{SUBJ}, \text{OBJ} \rangle \\ \text{UDF} \quad \left[ \begin{array}{l} \text{PRED} \quad \text{'pro'} \\ \text{PRONTYPE} \quad \text{Q} \end{array} \right] \\ \text{SUBJ} \quad \left[ \begin{array}{l} \text{PRED} \quad \text{'Jane'} \\ \text{PERSON} \quad 3 \\ \text{NUMBER} \quad \text{SG} \\ \text{GENDER} \quad \text{MASC} \end{array} \right] \\ \text{OBJ} \quad \left[ \begin{array}{l} \text{PRED} \quad \text{'pro'} \\ \text{PERSON} \quad 3 \\ \text{NUMBER} \quad \text{SG} \\ \text{GENDER} \quad \text{MASC} \end{array} \right] \end{array} \right]$	$\left[ \begin{array}{l} \text{PRED} \quad \text{'see'} \langle \text{SUBJ}, \text{OBJ} \rangle \\ \text{UDF} \quad \left[ \begin{array}{l} \text{PRED} \quad \text{'pro'} \\ \text{PRONTYPE} \quad \text{Q} \\ \text{PERSON} \quad 3 \\ \text{NUMBER} \quad \text{SG} \\ \text{GENDER} \quad \text{MASC} \end{array} \right] \\ \text{SUBJ} \quad \left[ \begin{array}{l} \text{PRED} \quad \text{'Jane'} \\ \text{PERSON} \quad 3 \\ \text{NUMBER} \quad \text{SG} \\ \text{GENDER} \quad \text{MASC} \end{array} \right] \\ \text{OBJ} \quad \left[ \begin{array}{l} \text{PRED} \quad \text{'pro'} \\ \text{PERSON} \quad 3 \\ \text{NUMBER} \quad \text{SG} \\ \text{GENDER} \quad \text{MASC} \end{array} \right] \end{array} \right]$
<i>Semantics</i>	Resumptive licensed by MR	Resumptive licensed by MR

Table 3: Syntax and semantics of SARs and SIRs

<sup>4</sup>And all other languages with grammatically licensed resumptive pronouns ...

## 6.2 Dual strategies: Lebanese Arabic

- We have seen that there are basically two strategies for resumptive-licensing, one which removes the resumptive from semantics but leaves it intact in syntax (SARS) and one that removes the resumptive from both semantics and syntax (SIRS).
- There is no a priori reason why a language could not engage both strategies. Lebanese Arabic is arguably just such a language.
- Aoun et al. (2001) note that Lebanese Arabic allows reconstruction at the site of resumption if the resumptive is not in an island, but resumptives in islands do not allow reconstruction.

(46) **No island**

təlmiiiz-[a]; l-kəsleen ma baddna nʔabbir [wala mʔallme]; ʔənnə huwwə zaʔbar  
 student-her the-bad NEG want.1P tell.1P no teacher that he cheated.3SM  
 b-l-faħṣ.  
 in-the-exam  
 ‘Her bad student, we don’t want to tell any teacher that he cheated on the exam.’  
 (Aoun et al. 2001: 381, (26b))

(47) **Adjunct island**

\* təlmiiiz-[a]; l-kəsleen ma ḥkiina maʔ [wala mʔallme]; ʔabl-ma huwwə yuʔṣal  
 student-her the-bad NEG talked.1P with no teacher before he arrive.3SM  
 ‘Her bad student, we didn’t talk to any teacher before he arrived.’  
 (Aoun et al. 2001: 381, (27b))

- These facts are immediately explained if Lebanese Arabic has both resumptive strategies available in its grammar.
- In an island, only the SARS strategy could be grammatical and this strategy does not allow reconstruction, since the pronoun is syntactically present.
- Outside an island, either strategy is available and the SIRS strategy allows reconstruction, since the pronoun is syntactically absent.

## 7 An Alternative Kind of Analysis

- We have seen that resumptive pronouns in some languages (e.g., Swedish) have the syntactic properties of gaps.
- In a recent paper, Sichel (2014) presents a Minimalist analysis of resumption that takes seriously the Doron–McCloskey Generalization, but argues that *resumptive pronouns are the result of competition with gaps*.
- I will take this paper as the most recent major exemplar of a common thread in the resumptive pronoun literature (among others, Zaenen et al. 1981, Engdahl 1985, Kayne 1994, Noonan 1997, Boeckx 2003).
- Put simply here is the tough question for Sichel’s view:  
 If resumptive pronouns compete with gaps, the input to the competition must be a consistent interpretation. However, resumptive pronouns and gaps do not support all and only the same interpretations. Therefore, *how can resumptive pronouns be in competition with gaps?*
- In other words, the tough problem for this kind of view is explaining why and how the competition would ever occur in the first place.

- Sichel (2014) is commendable in highlighting this problem particularly explicitly, but it is an implicit problem for any view that would “simply” treat a resumptive pronoun as a variable *just like a gap*.
- Moreover, I am unaware of any formal semantic theory of competition on offer in the relevant literature, no matter how initially compelling the idea may seem. For example, Sichel (2014) offers no semantic analysis or fragment.

## 8 Conclusion

- Resumptive pronouns are a typologically common phenomenon that present a challenge to linguistic theory that highlights two key linguistic interfaces:
  1. The syntax–phonology interface
  2. The syntax–semantics interface
- The analysis of resumption offers two fundamental *opposing* analytic choices:
  1. Resumptive pronouns are underlyingly traces/copies/gaps: Why then do they have the same **form** as ordinary pronouns? ⇒ **Complication at the syntax–phonology interface**
  2. Resumptive pronouns are not underlyingly traces/copies/gaps: Why then do they not saturate argument positions, i.e. contribute differently to **interpretation** than ordinary pronouns? ⇒ **Complication at the syntax–semantics interface**
- I have argued that a theory that treats resumptive pronouns as underlyingly like gaps, including any competition-based theory, has trouble reconciling these interface facts.
- I have presented the Resource Management Theory of Resumption (Asudeh 2012), which correctly reconciles the form of resumptives with their interpretation.
  1. Syntactically, there are two kinds of resumptives: *syntactically active resumptives* (SARs; e.g., Irish) and *syntactically inactive resumptives* (SIRs; e.g., Swedish)
  2. These can nevertheless be handled in a unified manner at the syntax–semantics interface through the mechanism of manager resources.
  3. Resumptive pronouns are just ordinary pronouns in this theory and have no special representation in the lexicon. This automatically accounts for their form (cf., the DMG). The remaining complication, which RMTR resolves, is the compositional one at the syntax–semantics interface.

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## Formal Details

### A Lexical-Functional Grammar

- LFG is a declarative, constraint-based linguistic theory (Kaplan and Bresnan 1982).
- The motivation behind LFG is to have a theory that contributes in three ways to our understanding of language:
  1. Theory, including language universals and typology
  2. Psycholinguistics, including language acquisition
  3. Computational linguistics, including automatic parsing and generation, machine translation, and language modelling

#### A.1 The Correspondence Architecture

- The grammatical architecture of LFG posits that different kinds of linguistic information are modelled by distinct data structures, all of which are present simultaneously.
- Structures are related by functions, called correspondence or projection functions., which map elements of one structure to elements of another.
- This architecture is a generalization of the architecture of Kaplan and Bresnan (1982) and is called the *Parallel Projection Architecture* or *Correspondence Architecture* (Kaplan 1987, 1989, Halvorsen and Kaplan 1988, Asudeh 2006, 2012, Asudeh and Toivonen 2009).
- Syntax: constituent structure (c-structure) and functional structure (f-structure).
- C-structure is represented by phrase structure trees:
  1. Word order
  2. Dominance
  3. Constituency
  4. Syntactic categories
- F-structure is represented by feature structures (also known as attribute value matrices):
  1. Grammatical functions, such as SUBJECT and OBJECT
  2. Case
  3. Agreement
  4. Tense and aspect
  5. Local dependencies (e.g., control and raising)
  6. Unbounded dependencies (e.g., question formation, relative clause formation)
- There are two principal methods for capturing the relations between structures:
  1. Description by analysis
  2. Codescription
- Description by analysis: one structure is analyzed to yield another structure (Halvorsen 1983)
- Codescription: a single description simultaneously describes various structures (Fenstad et al. 1987, Halvorsen and Kaplan 1988)

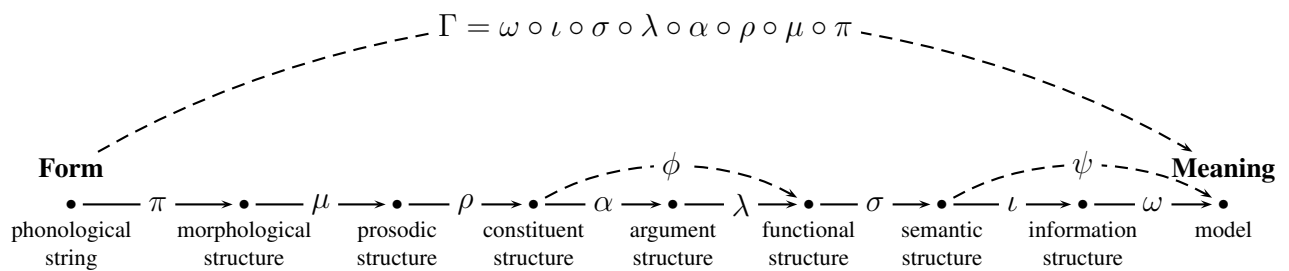


Figure 2: The Correspondence Architecture, pipeline version (Asudeh 2012)

## A.2 Unbounded Dependencies

- There are versions of LFG that postulate traces/empty categories at the base of (at least some) unbounded dependencies (Bresnan 1995, 2001) and versions which eliminate traces entirely (Kaplan and Zaenen 1989, Dalrymple 2001).

- All else being equal, elimination of traces is more parsimonious: I assume the traceless variant.

- An unbounded dependency involves equations of one of the following two general forms:

$$(48) \quad (\uparrow \mathbf{Top}) = (\uparrow \mathbf{Body} \mathbf{Base})$$

$$(49) \quad (\uparrow \mathbf{Top})_{\sigma} = ((\uparrow \mathbf{Base})_{\sigma} \text{ ANTECEDENT})$$

- The top of the unbounded dependency is an unbounded dependency function, traditionally TOPIC or FOCUS (King 1995).

- I will instead assume a single function, UDF (UNBOUNDED DEPENDENCY FUNCTION).

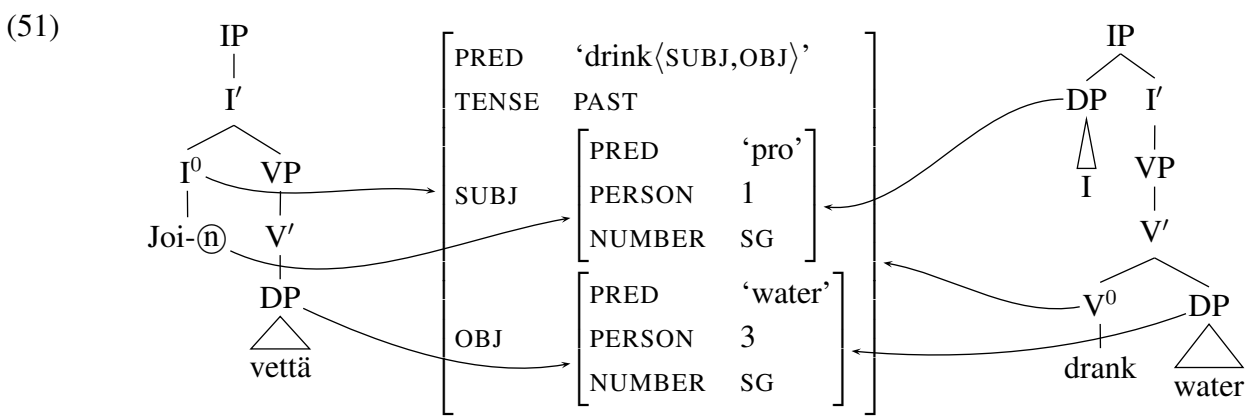
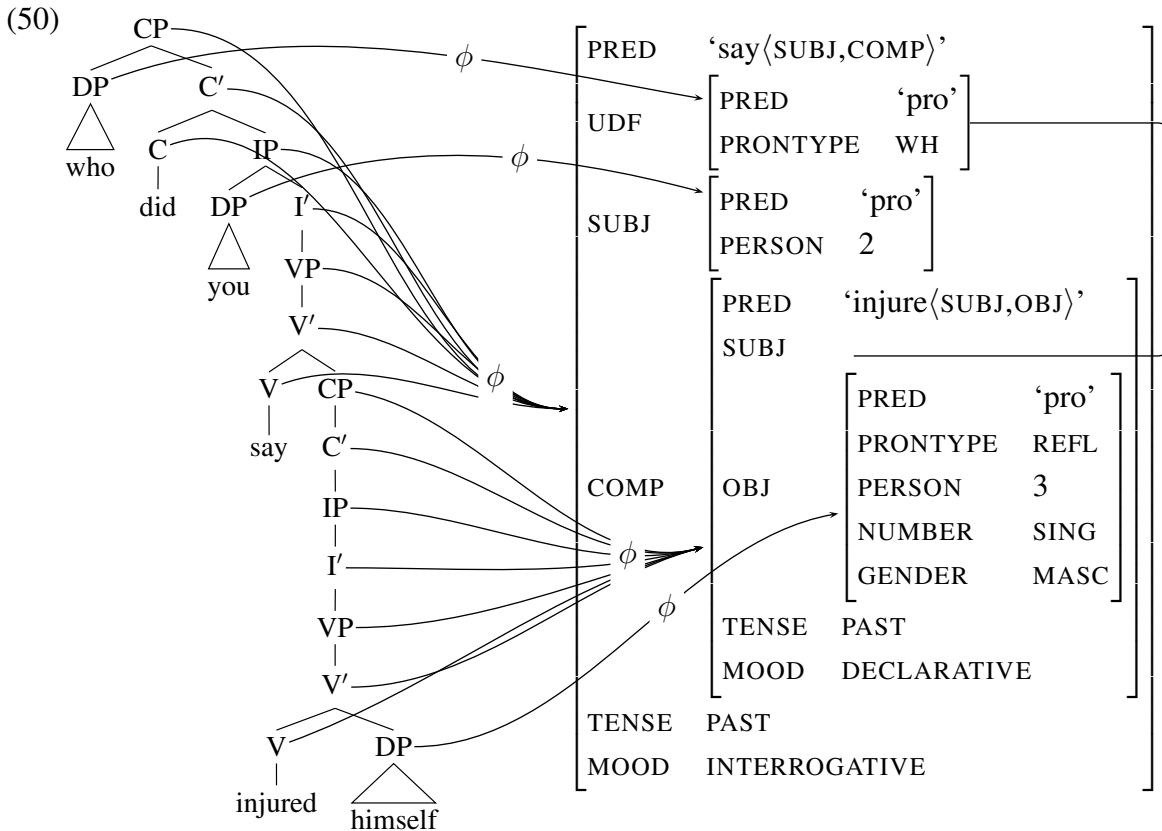
- A UDF function must be properly integrated into the f-structure, in accordance with the Extended Coherence Condition (Zaenen 1980, Bresnan and Mchombo 1987, Asudeh and Toivonen 2009), which states that a UDF must either a) be functionally equal to or b) anaphorically bind another grammatical function.

- Functional equality involves equations of the form (48). Anaphoric binding involves equations of the form (49). The type of equation in (49) involves the  $\sigma$  projection to sem(antic)-structure, since it is assumed that the ANTECEDENT feature for anaphoric binding is represented at sem-structure (Dalrymple 1993).

- The crucial difference between syntactically active resumptives and syntactically inactive resumptives is whether the relation between the binder and the resumptive is anaphoric binding — appropriate for SARs — or functional equality — appropriate for SIRs. I thus follow McCloskey's general suggestion that the two different kinds of grammatically licensed resumptives form different sorts of relations with their binders, but recast it in LFG-theoretic terms.

- This will allow the crux of the two kinds of resumption to be uniform and will allow the DMG to be upheld.

### A.3 Examples



### A.4 Restriction

- F-structures are sets of attribute-value pairs (attribute-value matrices).
- The restriction of some f-structure  $f$  by an attribute  $a$ , designated  $f \setminus a$ , is the f-structure that results from deleting the attribute  $a$  and its value  $v$  from f-structure  $f$  (Kaplan and Wedekind 1993: 198): the pair  $\langle a, v \rangle$  is removed from the set of pairs that constitutes the f-structure in question.

(52) **Restriction** (Kaplan and Wedekind 1993: 198)

If  $f$  is an f-structure and  $a$  is an attribute:  
 $f \setminus a = f \setminus \{a\} = \{ \langle s, v \rangle \in f \mid s \neq a \}$

- The restriction of an f-structure is itself an f-structure, so the operation can be iterated, but the outcome is not order-sensitive; restriction is associative and commutative in its attribute argument:  $[f \setminus a] \setminus b = [f \setminus b] \setminus a = f \setminus \{a, b\}$  (Kaplan and Wedekind 1993: 198).

- Restriction is defined in terms of set complementation: restriction of an f-structure by an attribute that the f-structure does not contain vacuously succeeds.

$$(53) \quad \text{a. } f = \begin{bmatrix} \text{PRED} & \text{'pro'} \\ \text{CASE} & \text{NOM} \end{bmatrix}$$

$$\text{b. } f \setminus \text{PRED} = \begin{bmatrix} \text{CASE} & \text{NOM} \end{bmatrix}$$

- $f \setminus a$  subsumes  $f$  ( $f \setminus a \sqsubseteq f$ )
- As an operation on f-structures, restriction can be combined with usual function-application as follows (Kaplan and Wedekind 1993: 198):

(54) If  $f$  and  $g$  are f-structures, then  $f \setminus a = g \setminus a$  is true if and only if  $f$  and  $g$  have all attributes and values in common other than  $a$ ; they may or may not have values for  $a$  and those values may or may not be identical.

## B Glue Semantics

- Glue Semantics (Dalrymple 1999, 2001, Asudeh 2004, 2005, 2012, Lev 2007, Kokkonidis 2008) is a theory of semantic composition and the syntax–semantics interface.
- Glue *meaning constructors* are obtained from lexical items instantiated in particular syntactic structures.

$$(55) \quad \mathcal{M} : G$$

$\mathcal{M}$  is a term from some representation of meaning, a *meaning language*, and  $G$  is a term of the Glue logic that sticks meanings together, i.e. performs composition. The colon is an uninterpreted pairing symbol.

- Linear logic (Girard 1987) serves as the Glue logic (Dalrymple et al. 1993, 1999a,b).
- The meaning constructors are used as premises in a (linear logic) proof that consumes the lexical premises to produce a sentential meaning.
- A successful Glue proof for a sentence terminates in a meaning constructor of type  $t$ :

$$(56) \quad \Gamma \vdash \mathcal{M} : G_t$$

- Alternative derivations from the same set of premises  $\rightarrow$  semantic ambiguity (e.g., scope)
- Linear logic is a *resource logic*: each premise in valid linear logic proof must be used exactly once.
- As discussed in detail by Dalrymple et al. (1999a), Glue Semantics is essentially a type-logical theory and is thus related to type-logical approaches to Categorical Grammar (Morrill 1994, Moortgat 1997, Carpenter 1997, Jäger 2005).
- The key difference between Glue and Categorical Grammar concerns grammatical architecture, particularly the conception of the syntax–semantics interface (Asudeh 2004, 2005, 2006). Glue Semantics posits a strict separation between syntax and semantics, such that there is a syntax that is separate from the syntax of semantic composition. Categorical Grammar rejects the separation of syntax from semantic composition.

- I assume a small, rather weak fragment of linear logic, multiplicative intuitionistic linear logic (MILL; Asudeh 2004, 2005).
- Three proof rules of this fragment are of particular interest here: elimination for  $\multimap$  (multiplicative conjunction) and introduction and elimination for linear implication  $\multimap$ .

Application : Impl. Elim.      Abstraction : Impl. Intro.      Pairwise substitution : Conj. Elim.

$$\frac{a : \quad f : \multimap}{f a :} \multimap \quad \frac{f :}{\lambda f : \multimap} \multimap \quad \frac{a : \quad f :}{\text{let } a \text{ be } \quad \text{in } f :} \multimap$$

Figure 3: Linear logic proof rules with Curry-Howard correspondence

(57) Bo chortled.

$$(58) \quad \frac{b : b \quad t : b \multimap}{t b :} \multimap$$

- Anaphora in Glue Semantics are typically treated as functions on their antecedents (Dalrymple et al. 1999c, Dalrymple 2001). This is a kind of a variable-free treatment of anaphora, which has also been adopted in certain Categorical Grammar analyses (Jacobson 1999, Jäger 2005, among others), although the two variable-free traditions developed separately.
- A variable-free treatment of anaphora is quite natural in Glue, because the commutative linear logic allows anaphora to combine directly with their antecedents, in opposition to the kind of intervening operations that are necessary for variable-free anaphoric resolution in non-commutative Categorical Grammar.
- The meaning constructor for a pronominal has the following general form, where  $\uparrow$  is the f-structure of the pronoun and  $\uparrow_\sigma$  is its  $\sigma$ -projection in sem-structure:

$$(59) \quad \lambda \quad : \uparrow_\sigma \text{ ANTECEDENT} \multimap \uparrow_\sigma \text{ ANTECEDENT} \uparrow_\sigma$$

- The pronoun's type is therefore  $\langle \sigma, \langle \sigma, \rangle \rangle$ , where  $\sigma$  is the type of the antecedent and  $\uparrow$  is the type of the pronoun. I here assume that both  $\sigma$  and  $\uparrow$  are type  $\text{IND}$  (individuals).

(60) Bo fooled himself.

$$(61) \quad \frac{\frac{\text{Bo} \quad \text{himself}}{b : \quad \lambda \quad : \multimap} \multimap \quad \frac{\text{fooled}}{: b \quad \lambda \quad \lambda \quad , \quad : \multimap \multimap} \multimap}{\frac{\lambda v f \quad , v : \multimap f}{f \quad , \quad : f} \multimap} \multimap}{\text{let } b \quad b \text{ be } \quad \text{in } f \quad , \quad : f} \Rightarrow \frac{}{f \quad b , b : f} \multimap$$

Notes on proof conventions:

- Linear logic terms are based on mappings from functional structure (syntax) to semantic structure (semantics). For example,  $(\uparrow \text{SUBJ})_\sigma$  is the semantic structure correspondent of the subject (SUBJ) of some predicate, where the predicate is designated by  $\uparrow$ .

$$\frac{t : \quad}{t :} \quad ( \text{ a constant, a variable} )$$

Figure 4: Linear logic: universal elimination

- Semantic structures may also contain features. For example, the ANTECEDENT feature seen above is in the semantic structure of  $\uparrow$ , since it occurs after  $\uparrow_\sigma$ . The features VAR(IABLE) and RESTR(ICTION), which are used to specify the meanings of common nouns as type  $\langle \ , t \rangle$  predicates, are also s-structure features.
- In proofs, these linear logic terms are abbreviated mnemonically. This is generally obvious, with the following exceptions:  $\sigma$  abbreviates the  $\sigma$ -projection of a pronoun,  $\text{VAR}$  abbreviates VAR, and  $\text{RESTR}$  abbreviates RESTR. Numerical modifiers may be used where necessary, e.g.  $\sigma_1$ ,  $\sigma_2$ , etc.
- Reductions in proofs are generally left implicit. The let term constructor may be somewhat less familiar, but its semantics is pairwise substitution, meaning it is just a more structured form of familiar functional application, which is clear from its  $\sigma$ -reduction:

(62)  $\text{let } x \text{ be } a \text{ in } b \Rightarrow f a \ , b$

- Scope points for quantifiers are represented as dependencies on universally quantified second-order variables of type  $\sigma$  in the linear logic. For example, the term  $a \multimap \multimap \sigma$  states that any dependency on resource  $a$  that results in a type  $\sigma$  resource can be discharged to yield just the type  $\sigma$  resource. The natural deduction proof rule for  $\multimap$ -elimination in linear logic is shown in Figure 4.

## C Manager Resources

Manager resources have the following general compositional schema, where  $\sigma$  is some pronoun that the lexical contributor of the manager resource can access and  $\tau$  is the antecedent or binder of  $\sigma$ :

(63)  $\tau \multimap \sigma \multimap \tau$

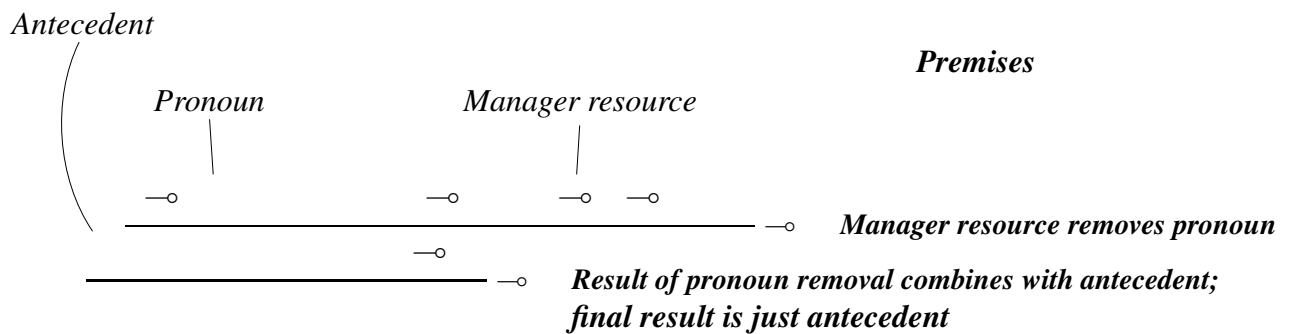


Figure 5: A manager resource in action (binder of lower type)



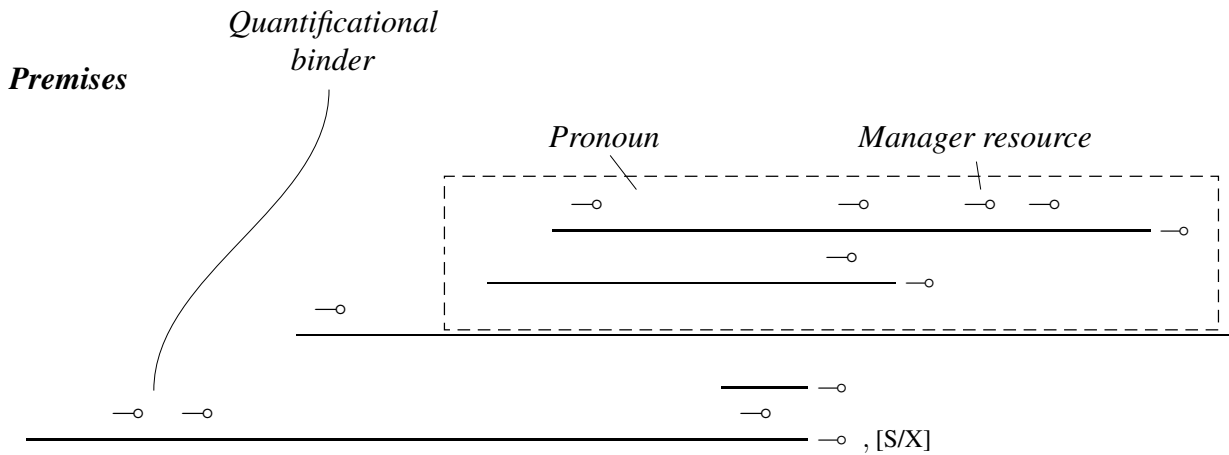


Figure 6: A manager resource in action (quantificational binder)

## D Fragments

### D.1 Irish

- (64) an ghirseach a-r ghoid na síogaí í (McCloskey 2002: 189, (9b))  
 the girl COMP-PAST stole the fairies her  
 ‘the girl that the fairies stole away’
- (65) *í*, D (↑ PERSON) = 3  
 (↑ NUMBER) = SG  
 (↑ GENDER) = FEM  
 @PRONOUN
- (66) @PRONOUN = (↑ PRED) = ‘pro’  
 (↑<sub>σ</sub> ANTECEDENT) → [(↑<sub>σ</sub> ANTECEDENT) ↑<sub>σ</sub>]
- (67) an fear a dtabharann tú an tairgead dó (McCloskey 1979: 6, (3))  
 the man COMP give you the money to.him  
 ‘the man to whom you give the money’
- (68) *dó*, P (↑ PRED) = ‘to<OBJ>’  
 (↑ OBJ PRED) = ‘pro’  
 (↑ OBJ PERSON) = 3  
 (↑ OBJ NUMBER) = SG  
 (↑ OBJ GENDER) = MASC
- (69) [<sub>CP</sub> *aL* ... [<sub>CP</sub> *aL* ... [<sub>CP</sub> *aL* ... — ... ]]]
- a. an t-ainm a hinnseadh dúinn a bhi — ar an áit (McCloskey 2002: 190, (13a))  
 the name *aL* was-told to-us *aL* was — on the place  
 ‘the name that we were told was on the place’
- (70) [<sub>CP</sub> *aN* ... [<sub>CP</sub> *go* ... [<sub>CP</sub> *go* ... *Rpro* ... ]]]
- a. fir ar shíl Aturnae an Stáit go rabh siad díleas do’n Rí  
 men *aN* thought Attorney the State *go* were they loyal to-the King  
 ‘men that the Attorney General thought were loyal to the King’  
 (McCloskey 2002: 190, (16))

- (71)  $[_{CP} aN \dots [_{NP} N [_{CP} aL \dots \_ \dots ]]]$  **Pattern 1**
- a. rud a raibh coinne agam a choimhlíonfadh    an aimsir  
 thing *aN* was expectation at-me *aL* fulfill.COND    the time  
 ‘something that I expected time would confirm’  
 (McCloskey 2002: 196, ~(28))
- (72)  $[_{CP} aL \dots [_{CP} aN \dots Rpro \dots ]]$  **Pattern 2**
- a. Cé is dóigh leat a bhfuil an t-airgead aige?  
 who *aL*.COP.PRES likely with-you *aN* is the money at-him  
 ‘Who do you think has the money?’  
 (McCloskey 2002: 198, (35))
- (73)  $[_{CP} aN \dots [_{CP} aN \dots Rpro \dots ]]$  **Pattern 3**
- a. na cuasáin thiorma ar shíl sé a mbeadh contúirt ar bith uirthi tuitim  
 the holes dry *aN* thought he *aN* would-be danger any on-her fall.[ FIN]  
 síos ionnta  
 down into-them  
 ‘the dry holes that he thought there might be any danger of her falling down into them’  
 (McCloskey 2002: 199, (44))

	Role Relative to Position			
	Not bottom	Bottom	Method	Cyclic?
<i>aL</i>	Passing	Grounding	Functional equality	Yes
<i>aN</i>	Passing	Grounding	Anaphoric binding	No

Table 4: The role of the Irish complementizers *aL* and *aN* in unbounded dependencies

- (74) a.  $[_{CP} aL \_ \dots \_ \text{pass} \_ \dots \_ \text{ground} \_ \dots ]]$  Core *aL* multi-clause pattern
- b.  $[_{CP} aN \_ \dots \_ \text{pass} \_ \dots \_ \text{ground} \_ \dots ]]$  Pattern 1
- c.  $[_{CP} aL \_ \dots \_ \text{pass} \_ \dots \_ \text{ground} \_ \dots Rpro \dots ]]$  Pattern 2
- d.  $[_{CP} aN \_ \dots \_ \text{pass} \_ \dots \_ \text{ground} \_ \dots Rpro \dots ]]$  Pattern 3

$$(75) \quad aL, C \quad \dots$$

$$(\uparrow \text{UDF}) = (\uparrow \quad \text{CF}^* \quad \text{GF})$$

$$(\rightarrow \text{UDF}) = (\uparrow \text{UDF})$$

$$(76) \quad aN, C \quad \dots$$

$$\% \text{Bound} = (\uparrow \text{GF}^* \{ \text{UDF} \mid [\text{GF} \text{UDF}] \})$$

$$\quad \quad \quad \text{@MR}(\rightarrow)$$

$$(\uparrow \text{UDF})_\sigma = (\% \text{Bound}_\sigma \text{ ANTECEDENT})$$

$$(77) \quad \text{@MR}(f) = \lambda \lambda \quad : \uparrow \text{UDF} \quad \sigma \quad \dashv \circ \quad \uparrow \text{UDF} \quad \sigma \quad \sigma \quad \dashv \circ \quad \uparrow \text{UDF} \quad \sigma \quad \dashv \circ \quad \uparrow \text{UDF} \quad \sigma$$

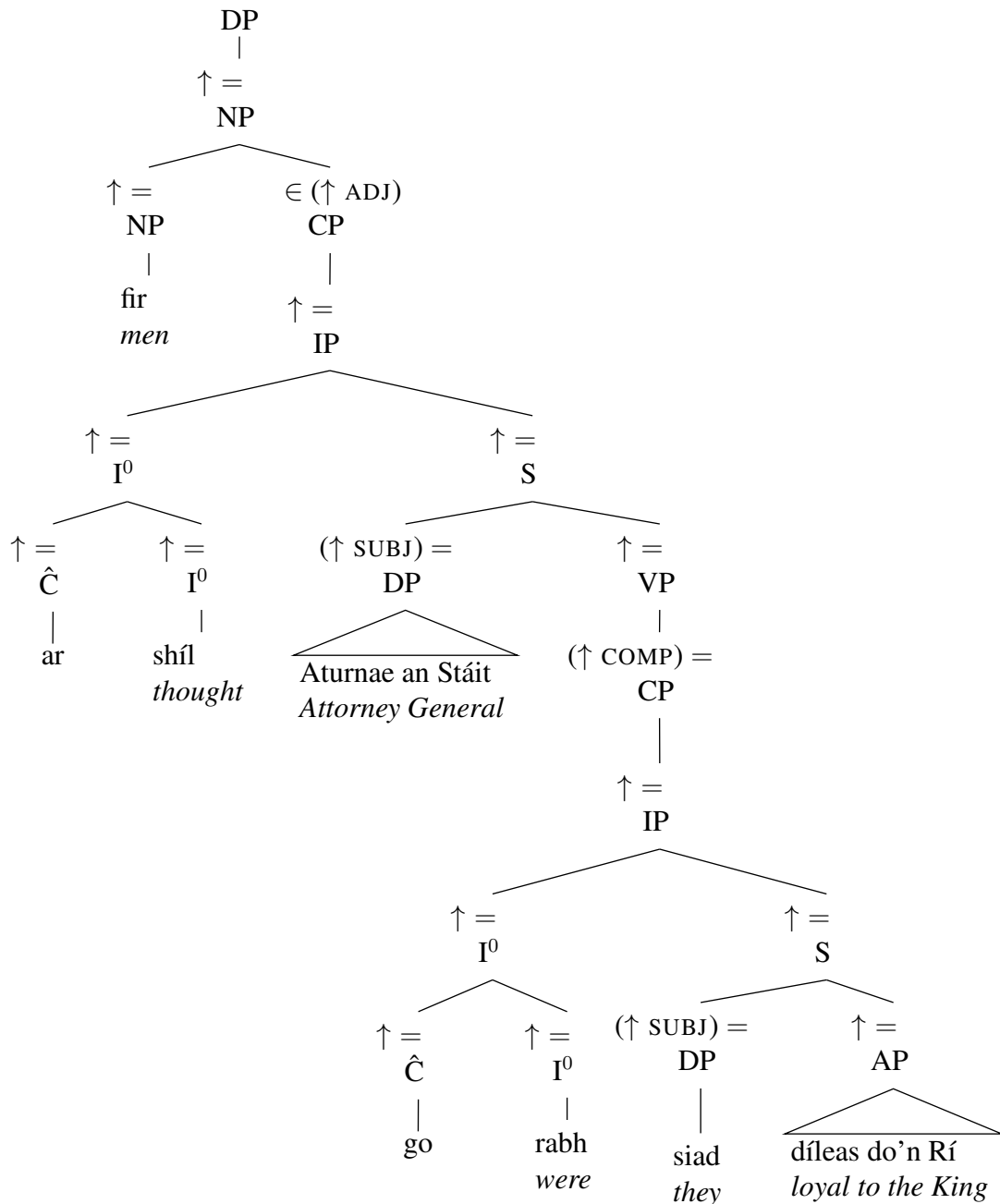
$$(78) \quad go, C \quad \dots$$

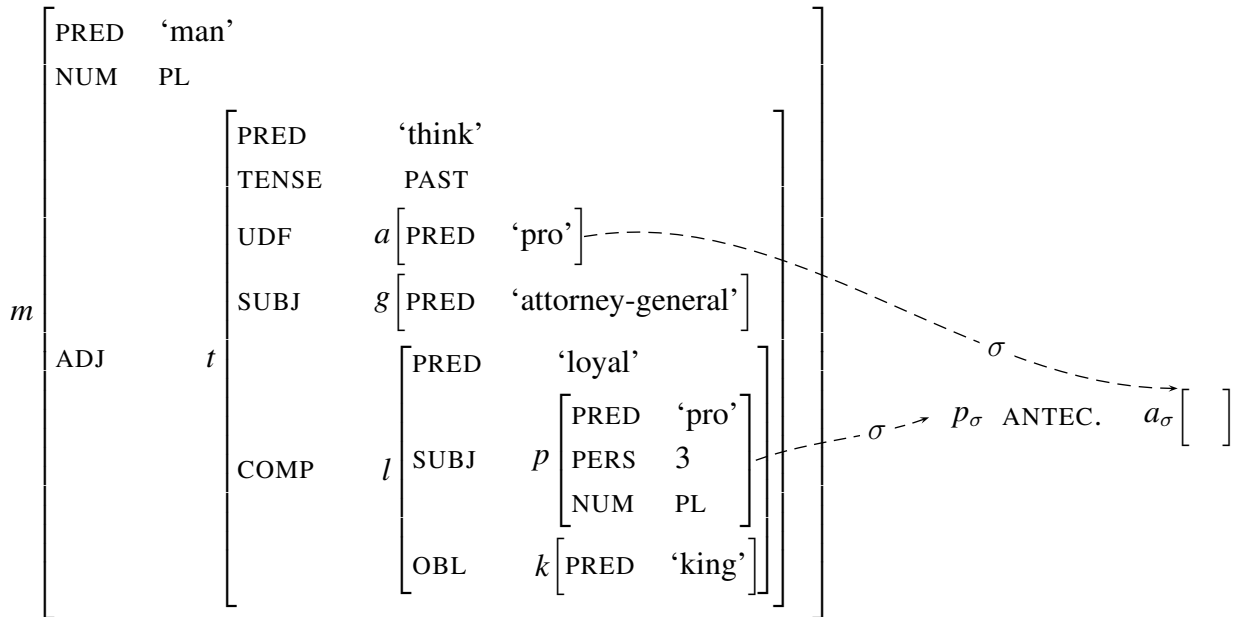
$$(\uparrow \text{UDF})$$

## D.1.1 Explicit Example

- (79) fir ar shíl Aturnae an Stáit go rabh siad díleas do'n Rí  
 men *aN* thought Attorney the State *go* were they loyal to-the King  
 'men that the Attorney General thought were loyal to the King'  
 (McCloskey 2002: 190, (16))

## (80) C-structure



(81) **F-structure and (partial) s-structure**(82) **Lexical contributor of manager resource<sup>5</sup>**

$aN, C \dots$   
 $\%Bound = (\uparrow GF^* \{ UDF \mid [GF \ UDF] \})$   
 $\quad \quad \quad @MR(\rightarrow)$   
 $(\uparrow UDF)_\sigma = (\%Bound_\sigma \text{ ANTECEDENT})$

(83) **Manager resource template**

$MR(f) = \lambda \lambda \quad : \uparrow UDF \ \sigma \ \rightarrow \ \uparrow UDF \ \sigma \quad \sigma \ \rightarrow \ \uparrow UDF \ \sigma \ \rightarrow \ \uparrow UDF \ \sigma$

(84) **Meaning constructors**

1.  $a \ * \ : \ v \ \rightarrow$  Lex. **fir** ('men')
2.  $\lambda \ \lambda \ \lambda \quad \quad \quad :$   
 $a \ \rightarrow \ t \ \rightarrow \ v \ \rightarrow \ \rightarrow \ v \ \rightarrow$   $\sigma$
3.  $\lambda \ \lambda \quad \quad :$  Lex. **ar** (aN, MR)  
 $a \ \rightarrow \ a \quad \quad \rightarrow \ a \ \rightarrow \ a$
4.  $\lambda \quad \quad \quad : \ \rightarrow \ t \ \rightarrow \ a \ \rightarrow \ t$  Lex. **ar** (aN, RELABEL)
5.  $t \quad \quad \quad : \ g \ \rightarrow \ \rightarrow \ t$  Lex. **shíl** ('thought')
6.  $a-g : g$  Lex. **Aturnae an Stáit** ('Attorney General')
7.  $\lambda \quad \quad \quad : \ a \ \rightarrow \ a \ \rightarrow$  Lex. **siad** ('they')
8.  $a \ -t : \ \rightarrow \ \rightarrow$  Lex. **díleas** ('loyal')
9.  $t \quad \quad \quad g \quad \quad :$  Lex. **do'n Rí** ('to-the King')

<sup>5</sup>Some notes on notation (see Dalrymple 2001 for the first two and Dalrymple et al. 2004 for the second; they are all also presented in Asudeh 2012):

- An expression introduced by % denotes a 'local name'. Local names, once instantiated, always refer to the same element, within the scope of a lexical entry. They are thus local variables. For example, both occurrences of %Bound are instantiated to the same valuation, where the valuation is specified by the equality in the line with the first occurrence of %Bound. Otherwise, since the expression to the right of the equal sign on the first line is non-deterministic, we would be in danger of not referring to the same f-structure in the two instances.
- The metavariable  $\rightarrow$  picks out the f-structure that is the value of the attribute that it adorns on each instantiation. In this case, the expression states that the argument to @MR is the f-structure that is the value of the terminating grammatical function, as picked out by [GF UDF].
- The @ sign indicates invocation of a template, which may have arguments or not. In this case, the MR (for 'manager resource') template is invoked by the resumptive-licensing complementizer.





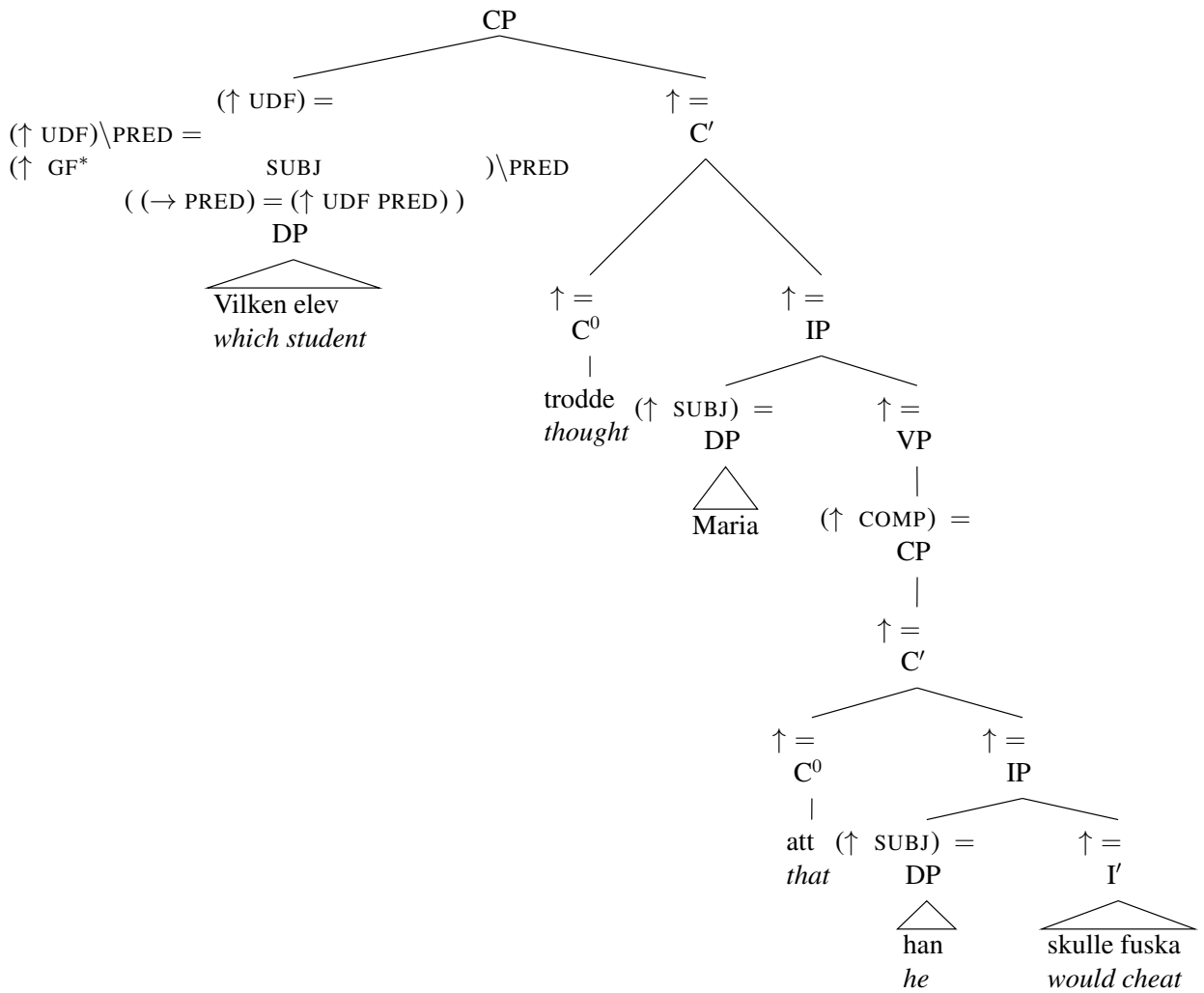
**D.2.1 Explicit Example**

(92) [Vilken elev]<sub>i</sub> trodde Maria att han<sub>i</sub> skulle fuska?  
 which student thought Maria that he would cheat  
 ‘Which student did Maria think that (he) would cheat?’

(93) **Lexical contributor of manager resource**  
 $\%RP = (\uparrow \text{SUBJ})$   
 +COMP:  $C^0$   $(\uparrow \text{UDF})_\sigma = (\%RP_\sigma \text{ ANTECEDENT})$   
 $@MR(\%RP)$

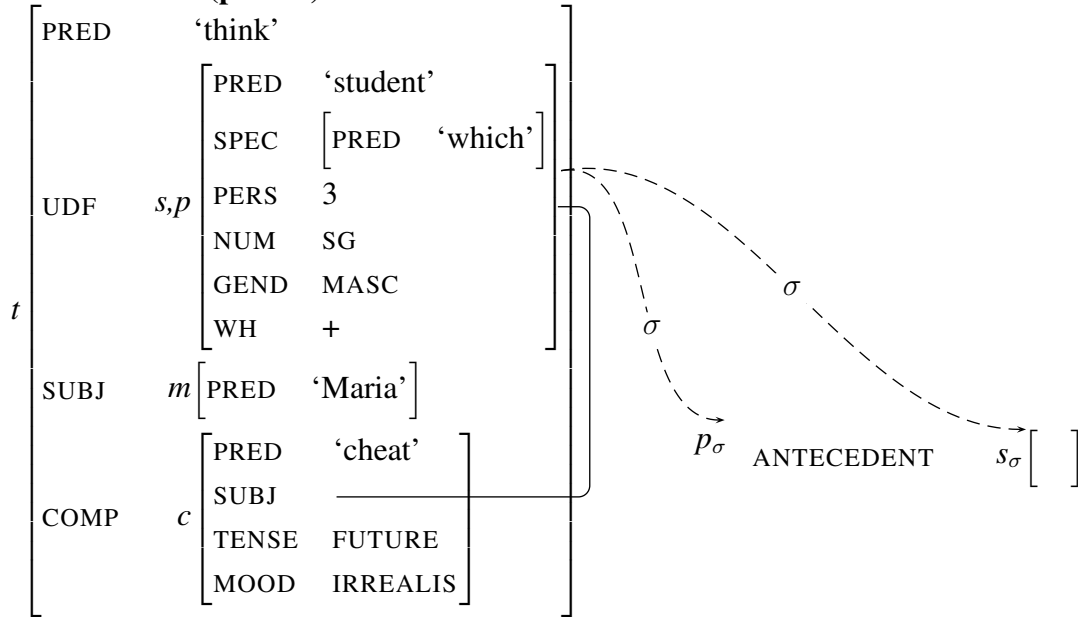
(94) **Manager resource template**  
 $MR(f) = \lambda \lambda : \uparrow \text{UDF } \sigma \multimap \uparrow \text{UDF } \sigma \quad \sigma \multimap \uparrow \text{UDF } \sigma \multimap \uparrow \text{UDF } \sigma$

(95) **C-structure**





(96) **F-structure and (partial) s-structure**



(97) **Meaning constructors**

1.  $\lambda st t, :$  Lex. **vilken elev** ('which student')
2.  $\lambda \lambda : s \multimap s \multimap s \multimap s$  Lex. **+COMP (MR)**
3.  $\lambda : \multimap t \multimap s \multimap t$  Lex. **+COMP (RELABEL)**
4.  $t : \multimap \multimap t$  Lex. **trodde** ('thought')
5.  $a a :$  Lex. **Maria**
6.  $\lambda : s \multimap s$  Lex. **han** ('he')
7.  $at : \multimap$  Lex. **fuska** ('cheat')

$$\begin{array}{c}
 \lambda \lambda : \quad \lambda : \\
 \frac{s \multimap s \quad \multimap s \multimap s \quad s \multimap s}{\lambda : s \multimap s} \quad : s \\
 \hline
 : s \\
 \hline
 \end{array}
 \qquad
 \begin{array}{c}
 \frac{\frac{\frac{at : \quad a \ a : \quad t :}{\multimap} \quad \multimap t}{at : \quad t \ a \ a : \multimap t}}{\frac{t \ a \ a, \ at : t}{\lambda \ t \ a \ a, \ at : \multimap t} \multimap} \quad \lambda :}{\lambda \ t \ a \ a, \ at : \multimap t} \multimap t \multimap s \multimap t} \\
 \hline
 \frac{\frac{t \ a \ a, \ at : t}{\lambda \ t \ a \ a, \ at : s \multimap t} \multimap} \quad \lambda \ st \ t, :}{st \ t, \lambda \ t \ a \ a, \ at : t} \multimap \quad [tX]
 \end{array}$$

Figure 8: Proof for example (92).