REPLACING COPIES

THE SYNTAX OF WH-COPYING IN GERMAN

Replacing Copies
The Syntax of Wh-Copying
in German

Kopieën vervangen

*De syntaxis van vraagwoorddubbeling
in het Duits*

(met een samenvatting in het Nederlands)

Proefschrift

door

Andreas Pankau

geboren op 1 maart 1981
te Berlijn, Duitse Democratische Republiek

*Linguistics must attempt to grasp language, not as a conglomerate of non-linguistic (*e.g., *physical, physiological, psychological, logical, sociological) phenomena, but as a self-sufficient totality, a structure* sui generis. *Only in this way can language in itself be subjected to scientific treatment without again disappointing its investigators and escaping their view.*

<div align="right">(Hjelmslev 1963, p. 5-6)</div>

Table of Contents

x

Acknowledgements

This thesis would have never been possible without the help, support, and inspiration of many people.

First and foremost, I wish to thank my supervisors, Eric Reuland and Norbert Corver. Their supervision was the best I could have. They gave me all the freedom I needed to develop my ideas, but applied the right amount of pressure whenever it was necessary. They helped me sharpening and improving my ideas, even though they didn't always agree with them. They constantly reminded me of focusing on my work, my claims, and my analysis, and not so much on what other people do. And despite the disagreements we have had about the direction the thesis took, Eric and Norbert always helped and supported me to go the way I had chosen.

The third person I want to thank is Paul Postal. It is hardly expressible what I owe to him. His work was a revelation at a time when I felt deeply desperate and dissatisfied about the field of syntax. It is fair to say that his work reconciled me with syntax and prevented me from leaving it. I thank him for his patience and willingness to answer all the many question I bombarded him with when he didn't know me or my work. I also want to thank him for the endless e-mail discussions, and his remarks and comments that improved this work a lot.

Special thanks go to my informants for the time they took to go through a never-ending questionnaire in order to provide me with judgments for many, many silly questions.

There are a number of linguists who contributed to this thesis, by discussing their ideas with me, by commenting on parts of this work, or by providing judgments and new data: Doug Arnold, Sjef Barbiers, Josef Bayer, Eefje Boef, Andreas Blümel, Bob Borsley, Pavel Caha, Marcel den Dikken, Gisbert Fanselow, Caroline Féry, Gaetano Fiorin, Eric Fuß, Hans-Martin Gärtner, Kim Gerdes, Gianluca Giorgolo, Erich Groat, Günther Grewendorf, Thomas Groß, Bettina Gruber, Fatima Hamlaoui, Sylvain Kahane, Tibor Kiss, Olaf Koeneman, Jan Köpping, Vasiliki Koukoulioti, Winfried Lechner, Marika Lekakou, Pavel Logačev, Gereon Müller, Stefan Müller, Øystein Nilsen, Timothy Osbourne, Christian Plunze, Henk van Riemsdijk, Martin Salzmann, Florian Schäfer, Ankelien Schippers, Viola Schmitt, Radek Šimík, Giorgos Spathas, Volker Struckmeier, Roberta Tedeschi, Craig Thiersch, Ewa Trutkowski, Christina Unger, Özlem Ünal, Helmut Weiß, Shravan Vasishth, and Gert Webelhuth.

I would also like to take the opportunity to thank Karl Maroldt, Gisbert Fanselow, Joanna Blaszczak, and Craig Thiersch, who were my teachers when I was an undergraduate. Without their trust and support, I would have never managed to even start this thesis.

The time in Utrecht was the best of my life. Thanks to UiL OTS (and especially to Martin Everaert and Maaike Schoorlemmer) for creating such a stimulating

Chapter 1

What This Thesis is About

1.1 The Topic

The topic of this thesis is the syntax of a peculiar long distance extraction construction of German, called *wh-copying* in the literature, illustrated in (1).

(1)   a. **Wen** glaubst du <u>wen</u> sie liebt?
            who believe you who she loves
            Who do you think she loves?
    b. **Wen** glaubst du <u>wen</u> er meint <u>wen</u> sie liebt?
            who believe you who he means who she loves
            Who do you think he believes she loves?

The peculiarity of this extraction construction is that the extracted wh-element is resumed: not only is there an extracted wh-element (the element set in **bold**, henceforth, the *extracted element*) itself appearing in its canonical position in the matrix clause, there is also an additional element (the element <u>underlined</u>, henceforth, the *resuming element[1]*) appearing in the initial position of every embedded clause. And although much research has already been devoted to this construction, there are still many descriptive gaps. Above all, there exists up to now no description of the resuming element and its connection to the extracted element that is compatible with all the data reported from German. Consequently, the topic of this thesis is wh-copying in general and the resuming element and its connection to the extracted element in particular.

---

[1] I deliberately refrain from calling this element *resumptive element* because it evokes connotations to the term *resumptive pronoun* and therefore to the idea that the relevant element in wh-copying is a resumptive pronoun. But this idea is argued against in section 4.4 of chapter 4, and in section 6.4.2 of chapter 6

1.2   The Aims

The aims of this thesis are threefold.

First, I investigate the properties of the wh-copying construction in more detail, and hereby especially the properties of the resuming element and its connection to the extracted element.

The second aim of this thesis is to develop an analysis of wh-copying – and here again of the resuming element and its connection to the extracted element – within the framework of *Arc Pair Grammar*. In particular, I aim to show that by adopting this framework, an analysis is possible which successfully explains both the presence of this element, its properties, and its connection to the extracted element.

The third aim is to show that the analysis developed for wh-copying and the resuming element proves helpful for the analysis of many syntactic phenomena distinct from wh-copying.

1.3   The Research Questions

The following four research questions are dealt with in the course of this investigation.

The first is whether wh-copying is a regular wh-question extraction like the one in (2), which is similar to wh-question extraction found in English, or whether it is a subspecies of the so-called WHAT-construction, exemplified in (3).

(2)   Wen glaubst du   dass sie liebt?
        who believe you that she loves
        Who do you think she loves?

(3)   Was glaubst du   wen sie liebt?
        what believe you who she loves
        Who do you think she loves?

Wh-copying shares features with both types of extraction. With regular wh-question extraction, it shares the presence of a wh-element in its canonical position, and with the WHAT-construction, it shares the presence of an element in the initial position of the embedded clause. Since the two extraction types involve partially different structures, the question is therefore whether wh-copying must be subsumed under the one or the other structure.

The second question I deal with is: what are the morphosyntactic properties of the resuming element? Without an answer to this question, it is impossible to set up an analysis for either the resuming element in the first place, let alone for its connection to the extracted element because it is unclear what kind of connection the relation has to establish.

The third question is whether it is possible to infer the properties of the resuming element and the way it is connected to the extracted element in such a way that both aspects turn out to be non-accidental. The answer to this question is *yes*, but only if one adopts a view on sentence structure in which grammatical relations are recognized as primitives. Such a perspective is taken by the Arc Pair Grammar framework, for which reason I chose it for my analysis.

The fourth question I deal with in this thesis is whether the tools provided by the Arc Pair Grammar framework for the analysis of wh-copying, the properties of the resuming element, and its connection to the extracted element are suitable for the analysis of syntactic phenomena independent of wh-copying. To put it more succinctly: does the suggested analysis rely on *ad hoc* assumptions and is it therefore stipulative, or is there independent evidence for the ingredients used in the analysis of wh-copying?

1.4   Overview of the Chapters

The organization of the thesis is as follows.

In chapter 2, I compare the properties of wh-copying with those of regular wh-question extraction and those of the WHAT-construction. Comparing all three constructions with respect to their syntactic and semantic properties, it turns out that wh-copying patterns with regular wh-question extraction but not with the WHAT-construction. From this observation, I conclude that wh-copying is a variety of regular wh-question extraction.

Chapter 3 is devoted to an investigation of the morphosyntactic properties of the resuming element in German. Based on new data involving complex wh-phrases as extracted elements I argue that the resuming element is an element distinct from the extracted element, and more specifically, a proform. Moreover, based on partially new data involving elements other than wh-proforms, I show that the resuming element is identical to a free relative proform, that is, to the type of proform used in free relative clauses. Finally, I show that the connection between the extracted element and the resuming element is subject to strict agreement restrictions, regulating inter alia the specification of identical case and prepositional marking.

In chapter 4, I evaluate previous analyses of wh-copying in light of the properties about the resuming element and its connection to the extracted element uncovered in chapter 3. I first investigate to what extent the characterizations of the resuming element given by the previous analyses are compatible with its properties uncovered in chapter 3, and argue that they are incompatible. I then argue that the previous analyses can either not be accommodated in such a way as to achieve compatibility with these properties, or that they can only be accommodated in this way by treating these properties as purely accidental.

Chapter 5 introduces the basics of the Arc Pair Grammar framework that are relevant for the formulation of the analysis I develop.

In chapter 6, I first outline in informal terms the analysis I present and then successively develop the analysis for wh-copying, the properties of the resuming

element, and its connection to the extracted element. As I show, the specific properties of the resuming element and its connection to the extracted element result from an interaction of the general analyses for proforms, extraction, and case and adpositional marking adopted in Arc Pair Grammar. In other words, the adoption of the Arc Pair Grammar framework allows the formulation of an analysis of the properties of wh-copying and the resuming element that treats these properties as non-accidental properties.

In chapter 7, it is argued that, apart from their generality, the Arc Pair Grammar analyses on which the account of the properties of the resuming element and its connection to the extracted element is based are not only suitable for an analysis of wh-copying, but also allow analyses for a number of phenomena unrelated to wh-copying, including inter alia successive cyclicity effects, covert movement, partial movement, and proforms in contexts where they don't mark coreference. To put it differently, I show that the analysis of wh-copying in general and the resuming element in particular is not based on allegedly *ad hoc* assumptions for the analyses of proforms, extraction, and case and adpositional marking.

Chapter 8 briefly outlines the variation found with respect to wh-copying structures both internal to German and crosslinguistically. I provide analyses for these different varieties of wh-copying and give a characterization of what it means for some construction C to count as wh-copying that incorporates this variation.

In chapter 9, the main results of this thesis are summarized.

1.5   The Contributions

There are three contributions of this thesis.

First, new data and novel empirical generalizations on wh-copying are respectively presented and formulated that are of interest for linguists working on extraction and/or German syntax independent of the theoretical school they belong to.

Second, an analysis for wh-copying is developed that is both empirically and theoretically superior to earlier analyses. Empirically, because data are taken into account that have either not been known or whose relevance has been underestimated. Theoretically, because the analysis relies on independently motivated theoretical machinery, so that no recourse to a property P is required in the analysis that would exclusively deal with the resuming element, its properties, or its connection to the extracted element.

Third, the thesis extends both the theoretical and empirical scope of the Arc Pair Grammar framework. As for its theoretical scope, a number of analyses are developed (agreement), refined (case and adpositional marking), and extended (extraction). In addition to this, the Arc Pair Grammar framework is applied to phenomena that have so far not been given an analysis in this framework.

Chapter 2

The Status of Wh-Copying in German

2.1 Introduction

The purpose of this chapter is to lay the basis for my treatment of wh-copying by delineating its scope. The issue I want to investigate here is whether the term 'wh-copying' should comprise only sentences of the type in (1a) also sentences of the type in (1b), which belong to the so-called *WHAT-construction*[1].

(1)   a. Wen glaubst du   wen die Ministerin t liebt?
              who believe you who the minister   loves
        b. Was glaubst du   wen die Ministerin t liebt?
              what believe you who the minister   loves
           Who do you think the minister loves?

The two types share two features. First, they are long distance extractions, in the sense that both are questions about a constituent belonging to an embedded clause. This is similar to the more standard varieties of question extraction in German of which there are two types: (i) wh-question extraction out of *dass*-clauses, and (ii) wh-question extraction out of verb-initial clauses. Both types are illustrated in (2a) and (2b), respectively.

(2)   a. Wen glaubst du   dass die Ministerin t liebt?
              who believe you that the minister   loves
        b. Wen glaubst du   liebt die Ministerin t?
              who believe you loves the minister
           Who do you think the minister loves?

Second, and more importantly, wh-copying and the WHAT-construction permit an additional element in intermediate position that corresponds to the questioned constituent. This similarity has led a number of researchers to the conclusion that

---

[1] This term is adopted from Fanselow 2006. The construction is sometimes also referred to as 'Scope Marking' or 'Partial Movement' (cf. Lutz et al. 2000). I agree with Fanselow though that either term is analytically biased, and I consequently avoid them in favor of the more neutral term 'WHAT-construction'.

wh-copying and the WHAT-construction actually constitute one type, and that therefore they should be analyzed identically (Bayer 1996, pp. 229-233; Brandner 2000, p. 49; Haider 2010, pp. 107-111; Höhle 2000, p. 259)[2]. The analysis for wh-copying and the WHAT-construction suggested by these researchers is sketched in (3a) and (3b) for the sentences in (1a) and (1b), respectively.

(3)   a. [Wen glaubst du [wen die Ministerin t liebt]]?

full movement   full movement

       b. [Was glaubst du [wen die Ministerin t liebt]]?

partial movement   full movement

The idea behind this analysis is the following. In both wh-copying and the WHAT-construction, some constituent is moved from the base position to the intermediate position and then further to its landing site in the matrix clauses. Although in both types the whole constituent is moved to intermediate position, the size of the material affected by movement from intermediate to final position differs: whereas it is again the whole constituent that is moved to the final position in wh-copying, it is only a subpart of the full constituent that is moved to its landing site in the WHAT-construction, viz. the [+wh]-feature, eventually spelled out as *was*.

I argue in this chapter that this conclusion is empirically unwarranted. An examination of the properties and the restrictions of the different wh-question extraction types in German shows that the WHAT-construction must be separated from wh-copying. More specifically, whereas wh-copying behaves like the regular extraction types, the WHAT-construction is characterized by specific properties.

The chapter is organized as follows. In section 2, I want to back up the claim that both wh-copying and the WHAT-construction are extraction constructions. In section 3, I present a comparison of the different extraction types. I then turn to the status of embedded clause in wh-copying and the WHAT-construction in section 4. The results of both sections indicate that wh-copying and the WHAT-construction should be kept apart. In section 5, I review additional properties that have been claimed to point to a close relationship between wh-copying and the WHAT-construction, and argue that these arguments fail because they either rest on shaky empirical foundations or only indicate properties that are shared by all extraction types. The chapter closes with a summary, section 6.

---

[2] The references mention only those works dealing with German. The idea to treat both types identically is also found in works dealing with these constructions in other languages, viz. Dutch (Barbiers et al. 2010), Frisian (Hiemstra 1986a, 1986b), and initially also Passamaquoddy (Bruening 2004), although Bruening later withdrew that analysis (Bruening 2006).

2.2 Wh-Copying and the WHAT-Construction as Extractions

Both wh-copying and the WHAT-construction share four defining features of extraction, summarized in (4).

(4) (i) they are unbounded
     (ii) they permit bridge verbs as matrix predicates
     (iii) they are categorially unrestricted
     (iv) they show connectivity effects

I illustrate each property briefly.

2.2.1 Unboundedness

The extracted element in wh-copying can be connected to its gap across what is in principle an unbounded domain, as first explicitly mentioned by Bayer 1996, Fanselow & Mahajan 2000, and Rett 2006. The effect is illustrated in (5).

(5) a. Wen meinst du wen er gesagt hat wen er t angerufen hat?
         who mean you who he said   has who he called   has
         Who do you think he said that he called?
                                                   (Bayer 1996, p. 249)
     b. Wen denkst du   wen sie meint   wen Harald t liebt?
         who think you who she means who Harald   loves
         Who do you think she believes Harald loves?
                                        (Fanselow & Mahajan 2000, p. 219)
     c. Wen glaubt John wen Hans meint wen Mary t getroffen hat?
         who believe John who Hans means who Mary   met   has
         Who does John think that Hans believes that Mary met?
                                                     (Rett 2006, p. 356)

Unboundedness is also characteristic of the WHAT-construction.

(6) a. Was glaubst du   was Peter sagt wen Maria t getroffen hat?
         what believe you what Peter says who Maria   met   has
         Who do you think Peter says Maria has met?
                                                     (Felser 2001, ex. 4)
     b. Was denkst du was sie meint was Fritz sagte wen Julia t liebt?
         what think you was she means what Fritz said who Julia   loves
         Who do you think she believes Fritz said Juliet loves?
                                                  (Fanselow 2006, ex. 53a)

    c. Was glaubst du   was Karl meint wen wir t gewählt haben?
         what believe you what Karl means who we   elected have
         Who do you believe Karl thinks we have elected?

                                                  (Höhle 2000, ex. 5a)

Finally, as the examples in (7) show, unboundedness is also a feature of the other two types of wh-question extraction in German.

(7)   a. Wen glaubt John dass Hans meint   dass Mary t getroffen hat?
            who believe John that Hans means that Mary   met   has
            Who does John think that Hans believes that Mary met?

                                             (Rett 2006, p. 356)

      b. Wen glaubst du   meint Hans hat Maria t getroffen?
            who believe you means Hans has Maria   met
            Who do you think that Hans believes that Maria met?

2.2.2   Bridge Verbs

As first explicitly stated by Felser 2004, p. 549, wh-copying is possible with bridge verbs, that is, with epistemic verbs such as *denken* (Engl. to think), *glauben* (Engl. to believe), and *meinen* (Engl. to mean), and with verba dicendi such as *sagen* (Engl. to say). It is illustrated for all four verbs in (8).

(8)   Wen glaubst/denkst/meinst/sagst du   wen sie t liebt?
        who believe/think/mean/say   you who she loves
        Who do you believe/think/mean/say she loves?

The same holds for the WHAT-construction.

(9)   Was glaubst/denkst/meinst/sagst du   wen sie t liebt?
        what believe/think/mean/say   you who she loves
        Who do you believe/think/mean/say she loves?

Again, classical bridge verbs are always possible in the other two types of wh-question extraction as well.

(10)   a. Wen glaubst/denkst/meinst/sagst du   dass sie t liebt?
          who believe/think/mean/say   you that she loves
      b. Wen glaubst/denkst/meinst/sagst du   liebt sie t?
          who believe/think/mean/say   you loves she
        Who do you believe/think/mean/say she loves?

2.2.3   No Categorial Restrictions

Wh-copying and the WHAT-construction share with other forms of wh-question extraction that the constituent undergoing fronting can be of any category: not only NPs[3], but also adverbs and PP[4]s are permitted. The examples in (11) illustrate this for wh-copying, those in (12) for the WHAT-construction, and finally those in (13) for the other two types of wh-question extraction.

(11) a. Wann glaubst du wann wir uns t treffen sollten?
          when believe you when we us   meet   should
          When do you think we should meet?
      b. Mit wem glaubst du   mit wem Hans t spricht?
          with whom believe you with whom Hans   speaks
          Who do you think Hans is talking to?

(12) a. Was glaubst du wann wir uns t treffen sollten?
          what believe you when we us   meet   should
          When do you think we should meet?
      b. Was glaubst du mit wem Hans t spricht?
          what believe you with whom Hans   speaks
          Who do you think Hans is talking to?

(13) a. Wann glaubst du   dass wir uns t treffen sollten?
          when believe you that we us   meet   should
      b. Wann glaubst du   sollten wir uns t treffen?
          when believe you should we us   meet
          When do you think we should meet?
      c. Mit wem   glaubst du   dass Hans t spricht?
          with whom believe you that Hans   speaks

---

[3] I deliberately use the label 'NP' throughout this work to refer to nominal constituents and refrain from using the label 'DP' because the evidence supporting the idea that the determiner is the head of a nominal constituent is meager in my view. In fact, all the evidence I could find in the literature is purely theory internal. Abney 1987 postulates an X-head, which he later identifies as D, inside gerunds to overcome the problem that the structure lacking this X-head violated X'-theory as there would an NP without a head noun (p. 17). Haider 1988, p. 41, favors the DP-hypothesis because it overcomes the problem that determiners are heads, yet can occupy a position usually designated to phrases only, viz. the specifier position. For Adger 2003, pp. 252-5, the DP-hypothesis is inevitable for otherwise his system of functional projections had to allow non-projecting heads. Alexiadou et al. 2007, pp. 3-4, attempt to motivate DPs empirically since having additional projections above the noun at one's disposal allows one to deal with word order variation inside nominal constituents, which variation can be analyzed via movement into the additional projections (p. 3). Although a valid motivation, it doesn't necessitate the view that the noun is not the head of the full nominal constituent. And to make things worse, Huddleston & Pullum 2002, pp. 357-8, point out that selection of a nominal constituent is often guided by features of the noun, but never by features of the determiner. For example, the verb *assassinate* selects a nominal constituent with a [+human] noun, but there is no verb that selects a nominal constituent whose determiner is downward entailing or has negative force.

[4] I use the label PP throughout this work although I later analyze NPs (cf. fn. 3) and PPs identically; cf. section 7 of chapter 6, and section 4 of chapter 7.

    d. Mit wem   glaubst du   spricht Hans t?
       with whom believe you speaks Hans
       Who do you think Hans is talking to?

I should note that some speakers do not accept PPs in wh-copying if they are fully phrasal, that is, if the preposition and its complement are not morphologically fused into one word (Fanselow & Mahajan 2000, p. 220; Fanselow & Cavar 2001, p. 123; Höhle 2000, p. 257). In other words, some speakers consider the sentences containing the unfused form of a PP ungrammatical (cf. (14)), whereas the very same speakers judge the sentences containing the fused from of a PP grammatical (cf. in (15)).

(14)   a.* Auf wen   hat sie gesagt auf wen   er t warten soll?
            on   whom has he said   on   whom he wait   should
            Who did she say he should wait for?
                                            (Höhle 2000, p. 257)
    b.* An wen   glaubst du   an wen   sie t denkt?
            on whom believe you on whom she thinks
            Who do you believe she is thinking of?
                                 (Fanselow & Mahajan 2000, p. 220)
    c.* Mit was denkst du   mit was   er sie t verletzt hat?
            with what think you with what he her hurt   has
            With what do you think he hurt her?
                                 (Fanselow & Cavar 2001, p. 123)

(15)   a. Wovon denkst du   wovon   wir t leben?
          what.of think you what.of we   live
          On what do you think we live?
                                      (Höhle 2000, p. 257)
    b. Wovon glaubst du   wovon   sie t träumt?
          what.of believe you what.of she dreams
          Who do you think she dreams of?
                                 (Fanselow & Mahajan 2000, p. 220)
    c. Womit   denkst du   womit   er sie t verletzt hat?
          what.with think   you what.with he her hurt   has
          With what do you think he hurt her?
                                 (Fanselow & Cavar 2001, p. 123)

Although this property has sometimes been taken as a defining characteristic of wh-copying in German (for example in Haider 2010, p. 109), it does not hold for all speakers, as was already pointed out by McDaniel in her thesis (McDaniel 1986); similar judgments were reported by Bayer 1996 and Rett 2006.

(16)   a. Mit wem   glaubst du mit wem   Hans t spricht?
          with whom believe you with whom Hans   speaks
          Who do you think Hans is talking to?
                                   (McDaniel, 1986, p. 182)

    b. Für wen   meinst du für wen   er jetzt t arbeitet?
        for whom mean   you for whom he now   works
        Who do you think he is working for now?

                                                  (Bayer 1996, p. 229)

    c. Auf wen   hat sie gesagt auf wen   er t warten soll?
        on whom has she said   on whom he wait   should
        Who did she say he should wait for?

                                                  (Rett 2006, p. 359)

2.2.4 Connectivity Effects

Wh-copying displays what Jacobson 1984 called connectivity effects, that is, the moved constituent respects selectional constraints imposed on it by the gap site. These include category, case, and φ-features (person, number, gender). The connectivity effects are illustrated in (17) and (18) for category and case, respectively.

(17)   a. Sie liebt den Peter/*an Peter.
            she loves the Peter/ on Peter
            She loves Peter.
        b. (*An) wen   glaubst du (*an) wen   sie t liebt?
              on whom believe you on whom she loves
            Who do you think she loves?
        c. Sie denkt   *den Peter/an Peter.
            she thinks   the Peter/on Peter
            She thinks of Peter.
        d. *(An) wen   meinst du *(an) wen   sie t denkt?
              on whom believe you on whom she thinks
            Who do you believe she thinks of?

(18)   a. Sie liebt den   Peter/*dem   Peter.
            she loves the.ACC Peter/ the.DAT Peter
            She loves Peter.
         b. Wen/   *wem   glaubst du wen/   *wem   sie t liebt?
            who.ACC/who.DAT believe you who.ACC/who.DAT she loves
            Who do you think she loves?
        c. Sie hilft *den   Peter/dem   Peter.
            she helps the.ACC Peter/the.DAT Peter
            She helps Peter.
        d. *Wen/   wem   denkst du *wen/   wem   sie t hilft?
            who.DAT/who.ACC think you who.DAT/who.ACC she helps
            Who do you think she helps?

Connectivity effects also hold for the WHAT-construction although they are only visible on the element in intermediate position because what occupies the landing site is by assumption only the [+wh]-feature, which gets spelled out as *was*.

(19) a. Was glaubst du (*an) wen sie t liebt?
         what believe you on who she loves
         Who do you think she loves?
     b. Was meinst du *(an) wen   sie t denkt?
         what believe you on whom she thinks
         Who do you believe she thinks of?
     c. Was glaubst du wen/   *wem   sie t liebt?
         what believe you who.ACC/who.DAT she loves
         Who do you think she loves?
     d. Was denkst du *wen/   wem   sie t hilft?
         what think   you who.ACC/who.DAT she helps
         Who do you think she helps?

Finally, connectivity effects can also be observed in the two regular types of wh-question extractions, as shown in (20)-(21) for wh-question extraction out of *dass*-clauses and wh-question extraction out of verb-initial clauses, respectively.

(20) a. (*An) wen glaubst du   dass sie t liebt?
          on   who believe you that she loves
         Who do you think she loves?
     b. *(An) wen   meinst du   dass sie t denkt?
          on   whom believe you that she thinks
         Who do you believe she thinks of?
     c. Wen/   *wem   glaubst du   dass sie t liebt?
         who.ACC/who.DAT believe you that she loves
         Who do you think she loves?
     d. *Wen/   wem   denkst du   dass sie t hilft?
          who.ACC/who.DAT think   you that she helps
         Who do you think she helps?

(20) a. (*An) wen glaubst du   liebt sie t?
          on   who believe you loves she
         Who do you think she loves?
     b. *(An) wen   meinst du   denkt sie t?
          on   whom believe you thinks she
         Who do you believe she thinks of?
     c. Wen/   *wem   glaubst du   liebt sie t?
         who.ACC/who.DAT believe you loves she
         Who do you think she loves?
     d. *Wen/   wem   denkst du   hilft sie t?
          who.ACC/who.DAT think   you helps she
         Who do you think she helps?

2.3 A Comparison of the Extraction Types

In this section, I argue that wh-copying should be distinguished from the WHAT-construction. This conclusion is arrived at in the following way. I discuss a number of properties and restrictions that have been claimed the wh-copying and the WHAT-construction share exclusively and compare them with the regular wh-question extraction types. It turns out that the similarities between wh-copying and the WHAT-construction are deceptive. In fact, they don't share a single property exclusively. In addition, and certainly more importantly, wh-copying always behaves like the regular extraction types, whereas the WHAT-construction manifests idiosyncratic constraints.

2.3.1 Predicate Restrictions

Predicate restrictions have often been claimed to be identical for wh-copying and the WHAT-construction. However, on closer inspection, these similarities are deceptive. Taking the regular extraction types into account, it turns out that wh-copying always patterns with the regular extraction types and never with the WHAT-construction, and that the WHAT-construction is characterized by a number of idiosyncratic constraints.

2.3.1.1 Volitional Predicates

Fanselow & Mahajan 2000, Fanselow 2006, and Reis 2000 observe that volitional predicates are impossible as matrix predicates in the WHAT-construction.

(22) a.* Was möchtest du   wen sie t liebt?
          what want   you who she loves
          Who do you want her to love?
                        (Fanselow & Mahajan 2000, p. 217; Fanselow 2006, p. 472)
      b.* Was möchte Fritz wen seine Tochter   t heiratet?
          what wants Fritz who his   daughter   marries
          Who does Fritz want his daughter to marry?
                                                      (Reis 2000, p. 382)

The same researchers claim that volitional predicates are not permitted as matrix predicates in wh-copying either.

(23) a.* Wen möchtest du   wen sie t liebt?
          who want   you who she loves
          Who do you want her to love?
                                        (Fanselow & Mahajan 2000, p. 220)

      b.* Wen möchte Peter wen Petra t heiratet?
          who wants   Peter who Petra   marries
          Who does Peter want that Petra marries?

                                            (Reis 2000, ex. 107b)

At first sight, this is an argument for a unified treatment of wh-copying and the WHAT-construction because the regular extraction types do allow extraction over volitional predicates.

(24)   a. Wen will   Hans dass Jakob t besticht?
           who w ants Hans that Jakob   bribes
           Who does Hans want Jakob to bribe?

                                         (McDaniel 1989, p. 572)

       b. Wen möchtest du   dass sie t liebt?
           who want   you that she loves
           Who do you want that she loves?

                                         (Fanselow 2006, p. 472)

       c. Wen möchte/will Fritz dass seine Tochter   t heiratet?
           who   wants   Fritz that his   daughter   marries
           Who does Fritz want his daughter to marry?

                                          (Reis 2000, p. 382)

This argument however is problematic. On the one hand, as reported in McDaniel 1986 and Simpson 2000, some speakers do allow volitional predicates as matrix predicates – a judgment the present author shares – and Andersson & Kvam 1984 even provide an example from a corpus.

(25)   a. Wen willst du   wen Hans t anruft?
           who want you who Hans   calls
           Who do you want Hans to call?

                                         (McDaniel 1986, p. 184)

       b. Wen willst du   wen Hans t besticht?
           who want you who Hans   bribes
           Who do you want Jakob to bribe?

                                      (Simpson 2000, p. 162-3)

       c. Was du   nicht willst was man dir t tu, füg   auch keinem andern zu.[5]
           what you not   want what one you do inflict also no.one other   PRT
           Do unto others as you would have others do unto you.

                              (Andersson & Kvam 1984, p. 112)

On the other hand, there is a fact rarely mentioned in the literature on wh-copying, viz. that extraction across volitional predicates is certainly not judged grammatical

---

[5] Given the presence of two *was* in this sentence, it is at first sight unclear whether one really deals with wh-copying or not rather with the WHAT-construction. However, this sentence is unlikely to be an example of the WHAT-construction because the WHAT-construction is incompatible with both volitional verbs and negation (cf. the next point of this subsection).

by all speakers. Andersson & Kvam 1984 reported variation with respect to the judgments for the sentence in (26): out of 40 speakers, 30 speakers judged it grammatical, 2 speakers were unsure regarding its grammaticality status, and 8 speakers rejected it completely.

(26)   Wen willst du   dass ich t schicke?
        who want you   that I   send
        Who do you want me to send?
                                                                    (Andersson & Kvam 1984, p. 70)

So what we observe is that speakers vary on their judgements concerning volitional predicates as matrix predicates. However, this variation *only* affects wh-copying and extraction out of *dass*-clauses, but *never* the WHAT-construction. Consequently, what patterns together are wh-copying and the regular extraction types and not wh-copying and the WHAT-construction. Therefore, with respect to volitional predicates, wh-copying resembles regular extraction more than it resembles the WHAT-construction, indicating that the WHAT-construction should receive a different treatment from the one for wh-copying.

I have so far discussed only the parallel behavior of wh-copying and wh-question extraction out of *dass*-clauses. That was motivated by the fact that wh-question extraction out of verb-initial clauses shows no variation: it is always ungrammatical with volitional predicates.

(27) * Wen willst du   soll   sie t einladen?
        who want you should she invite
        Who do you want her to invite?
                                                                    (Fanselow & Mahajan 2000, p. 218)

This state of affairs is at first glance hard to reconcile with the idea that wh-copying behaves identically to regular wh-question extraction because in fact, it seems to behave only like one type. However, the invariance of the judgments reported in (26) is arguably due to independent factors. Wh-question extraction out of verb-initial clauses has been analyzed in two different ways, and both can account independently for the special behavior of this construction reflected in the judgments in (27). The first approach (for example Grewendorf 1988, p. 87) claims that the source for this construction is an embedded V2 clause out which extraction takes place. Interestingly, volitional predicates do not allow embedded V2 clauses.

(28) * Ich will den Mann soll   sie einladen.
        I   want the man   should she invite
        I want her to invite the man.

As the source for (27) is always ungrammatical, wh-question extraction out of verb-initial clauses would preserve this status. The other line of analysis claims that wh-question extraction out of verb-initial clauses involves the insertion of a parenthetical (cf. Reis 1995). That is, a sentence such as (29a) has the structure in (29b) in which the parenthetical *glaubst du* is inserted preverbally.

(29) a. Wen glaubst du hat sie t gesehen?
          who believe you has she seen
          Who do you think she has seen?
      b. Wen – glaubst du – hat sie t gesehen?

Independent of the arguments for this analysis[6], it faces no problems explaining the invariant judgment in (27). For structures involving clear, sentence-final parentheticals show that parentheticals cannot be based on volitional predicates.

(30) * Wen soll   sie t einladen willst du?
        who should she invite   want you
        Who do you want her to invite?

Also under this analysis, then, the seemingly problematic judgment for (27) is due to an independent constraint, viz. to the non-well-formedness of the parenthetical expression.

2.3.1.2 Negated Predicates

A second argument that has been put forward in support of an underlying similarity between wh-copying and the WHAT-construction involves negated matrix predicates. There exists a broad consensus in the literature that negated predicates are unavailable in wh-copying as well (for example, Fanselow 2006, p. 470; Felser 2004, p. 555; Reis 2000, p. 395; Rett 2006, p. 359).

(31) * Wen glaubst du   nicht wen sie t liebt?
        who believe you not   who she loves
        Who don't you think she loves?

---

[6] There are two arguments in favor of this analysis. First, the position hosting *glaubst du* can host other, clear parenthetical expressions such as vocatives, cf. (i).
(i) Was – meine Damen und Herren – hat Guido Westerwelle sich dabei nur t gedacht!?
     what my   ladies and gentlemen has Guido Westerwelle SELF it.by only thought
     What, ladies and gentlemen, had Guido Westerwelle in mind at that time!?
Second, *glaubst du* is not restricted to the preverbal position, but can also appear in postverbal and sentence-final position, similar to clear parenthetical expressions, cf. the examples in (ii).
(ii) a. Wen hat – glaubst du – sie t gesehen?
         who has believe you she seen
     b. Wen hat sie t gesehen – glaubst du?
         who has she seen   believe you
         Who do you think she has seen?
     c. Was hat – meine Damen und Herren – Guido Westerwelle sich dabei nur t gedacht!?
         what has my   ladies and gentlemen Guido Westerwelle SELF it.by only thought
     d. Was hat Guido Westerwelle sich dabei nur t gedacht – meine Damen und Herren!?
         what has Guido Westerwelle SELF it.by only thought   my   ladies and gentlemen
         Ladies and gentlemen, what had Guido Westerwelle in mind at that time!?

As observed for example by Reis 2000 and Fanselow 2006, negated matrix predicates are not permitted in the WHAT-construction either[7].

(32)   a.* Was glaubt   sie nicht wen Hans t liebt?
            what believes she not   who Hans   loves
            Who doesn't she believe Hans loves?
                                              (Fanselow & Mahajan 2000, ex 57b)
       b.* Was glaubst du   nicht mit wem Hans sich t getroffen hat?
            what believe you not   with whom Hans SELF met   has
            With whom do you think Hans will meet there?
                                                        (Reis 2000, p. 378)

This contrasts with regular extraction, in which movement across a negated predicate does not lead to ungrammaticality.

(33)   a. Wen denkst du   nicht dass sie t liebt?
            who think you not   that she loves
            Who don't you think she loves?
                                              (Fanselow 2006, p. 471)
       b. Mit wem glaubst du   nicht dass Hans sich dort t treffen wird?
            with whom believe you not   that Hans SELF there   meet will
            With whom don't you think Hans will meet there?
                                                        (Reis 2000, p. 378)

This contrast seemingly indicates an exclusive similarity of wh-copying with the WHAT-construction. However, similar to volitional predicates, the argument is problematic. First, there are speakers that do accept wh-copying across negated predicates without any problems. One piece of evidence has already been in the previous paragraph, viz. example (24c), which contains a negated volitional predicate. Moreover, two of the five speakers investigated in Pankau 2007 judged sentences with negation in the matrix clause grammatical, cf. (34).

(34)   Wen glaubst du   nicht wen sie t gesehen hat?
        who believe you not   who she seen   has
        Who don't you think she has seen?

Second, this variation regarding intervening negation is mirrored by the other extraction types because negated predicates are not accepted by all speakers of German as matrix predicates in regular extraction. For example, Grewendorf 1989 judges that usage ungrammatical, and Cheng 2000, Sabel 2000 and Müller 2009 judge it as rather deviant.

---

[7] I restrict myself to negated predicates and disregard other elements with negative force such as negative quantifiers like *keiner* (Engl. none) because their status is unclear: Höhle 2000, ex. 34a, judges them ungrammatical, Fanselow & Mahajan 2000, ex. 57c, as mildly deviant, and to my ear they are perfectly fine.

(35)   a.* Wen glaubst du   nicht dass dieses Beispiel t überzeugen kann?
               who think   you not   that this   example convince   can
               Who don't you think this example can convince?

                                                              (Grewendorf 1989, p. 88)

        b. [?]Wen glaubst du   nicht dass Hans t getroffen hat?
               who think   you not   that Hans met   has
               Who don't you think Hans has met?

                                                              (Cheng 2000, p. 95)

        c.^{??}Wen glaubst du   nicht dass Hans t überzeugt hat?
               who think   you not   that Hans   convinced has
               Who don't you think Hans has convinced?

                                                              (Sabel 2000, p. 420)

        d. [?]Wen glaubst du   nicht dass man t einladen sollte?
               who think   you not   that one   invite   should
               Who don't you think one should invite?

                                                              (Müller 2009, p. 19)

It seems that there is no correlation concerning the possibility of intervening
negation between the two types of extraction. The two speakers whose judgments I
report in (33) rejected intervening negation for extraction out of *dass*-clauses but did
accept it for wh-copying. This is in fact the reverse of the pattern usually assumed in
the literature, which one speaker showed.

Similar to volitional predicates, we observe variation with respect to negated
predicates for wh-copying and the two regular wh-question extraction types. But
what we do observe is a similar variation for the WHAT-construction; it is always
ungrammatical. I am therefore inclined to conclude that also for this case, the WHAT-
construction is different from both wh-copying and regular extraction, which pattern
together.

Wh-question extraction out of verb-initial clauses again differs: intervening negation
is at best marginally grammatical in this extraction type.

(36) ^{??}Wen glaubst du   nicht hat sie t gesehen?
          who   believe you not   has she seen
          Who don't you think she has seen?

Despite this difference from wh-question extraction out of verb-final clauses, neither
analysis for wh-question extraction out of verb-initial clauses sketched above faces a
problem with this fact. Negated matrix verbs do not allow embedded V2 clauses (cf.
Antomo & Steinbach 2010, p. 5), as shown in (37a), and structures involving clear,
sentence-final parentheticals show that parentheticals cannot contain negation, as
(37b) illustrates [8].

---

[8] This still leaves the difference between (36) and (37a) unexplained. This is most likely due to the reason
that (36) can get a regular, cross-clausal extraction structure, which is impossible for (37a); cf. Pankau et
al. 2010 for details.

 (37)   a. Ich glaube (*nicht) den Mann hat sie gesehen.
            I   believe not   the man   has she seen.
            I don't believe that she has seen the man.
        b. Wen hat   sie t gesehen glaubst du (*nicht)?
            who has she seen   believe you not
            Who don't you think she has seen?

So in either analysis, the differences between extraction out of *dass*-clauses and
extraction out of verb-initial clauses follow from independent differences between
the two types.

2.3.1.3 Other Similarities

I finally mention some more direct evidence that supports the idea that wh-copying
and regular extraction pattern alike, and differ from the WHAT-construction. First,
raising predicates are permitted in wh-copying and regular extractions, but not in the
WHAT-construction.

(38)   a. Wen scheint es wen Hans t geschlagen hat?
           who seems it who Hans   beaten   has
           Who does it seem that Hans hit?

                                                    (McDaniel 1986, p. 247)

       b. Wen scheint es dass sie t liebt?
           who seems it that she loves
       c.* Was scheint es wen sie t liebt?
           what seems it who she loves
           Who does it sesm she loves?

                                    (Fanselow & Mahajan 2000, ex. 14a & 14b)

Second, there are predicates that are permitted in the WHAT-construction but in
neither regular extraction types nor wh-copying. Two such verbs are *vermuten*
(Engl. to suppose) and *entscheiden* (Engl. to decide).

(39)   a. Was vermutest du   wem sie t geholfen hat?
           what suppose   you who she helped   has
       b.* Wem vermutest du   dass sie t geholfen hat?
           who suppose   you that she helped   has
       c.* Wem vermutest du   hat sie t geholfen?
           who suppose   you has she helped
       d.* Wem vermutest du   wem sie t geholfen hat?
           who suppose   you who she helped   has
           Who do you think she has helped?

(40)   a. Was hat Hans entschieden wer t kommen soll?
            what has Hans decided   who   come   should
        b.* Wer hat Hans entschieden dass t kommen soll?
            who has Hans decided   that come   should
                                                (Stechow 2000, ex. 34a & 34b)
        c.* Wer hat Hans entschieden soll   t kommen?
            who has Hans decided   should come
        d.* Wer hat Hans entschieden wer t kommen soll?
            who has Hans decided   who come   should
            Who did Hans decide should come?

In sum, predicate restrictions do not point to any similarity between wh-copying and the WHAT-construction, in fact, they point in precisely the opposite direction, viz. to a dissimilarity between the two types of extraction.

2.3.2   Island Sensitivity

A further difference between the WHAT-construction on the one hand and wh-copying and the other extraction types on the other shows up with islands. Wh-copying and the regular extraction types are subject to all standard islands[9], as illustrated in (41) and (42)[10].

(41)   (i) Subject clauses
        a.* Wen ist allen aufgefallen [$_{Subject}$ wen sie t liebt]?
            who is all   apparent   who she loves
            * Who was it apparent to everyone that she loves?
        (ii) Complex NPs
        b.* Wen machte Peter [$_{NP}$ die Behauptung [$_S$ wen sie t liebt]]?
            who made   Peter   the claim   who she loves
            * Who did Peter make the claim that she loves?
        (iii) Coordination
        c.* Wen glaubst du [$_{\&P}$ [dass Peter Maria liebt] und [wen Max t schlägt]]?
            who believe you   that Peter Maria loves and who Max beats
            * Who do you think that Peter loves Mary and that Max beats?
        d.* Wen glaubst du [$_{\&P}$ [wen Peter Maria liebt] und [dass Max t schlägt]]?
            who believe you   who Peter Maria loves and that Max beats
            * Who do you think that Peter Mary and that Max beats Hans?

---

[9] Other islands are impossible to illustrate. The island status of indirect questions is impossible to illustrate because predicates selecting indirect questions are banned from wh-copying for independent reasons (cf. fn. 14), and other well-known island configurations such as adjunct clauses and relative clauses are impossible to test for a reason to be discussed in chapter 3, section 2.

[10] The island sensitivity of wh-copying has to my knowledge never been mentioned before. This surely does not mean that it escaped notice. What I consider more likely is that it was perceived as so trivial that it didn't seem worth mentioning.

(42)   (i) Subject clauses
        a.* Wen ist allen aufgefallen [_Subject dass sie t liebt]?
            who is all   apparent   that she loves
        b.* Wen ist allen aufgefallen [_Subject liebt sie t]?
            who is all   apparent   loves she
            * *Who was it apparent to everyone that she loves?*
        (ii) Complex NPs
        a.* Wen machte Peter [_NP die Behauptung [_S dass sie t liebt]]?
            who made Peter   the claim   that she loves
        b.* Wen machte Peter [_NP die Behauptung [_S liebt sie t]]?
            who made Peter   the claim   loves she
            Who did Peter make the claim that she loves?
        (iii) Coordination
        a.* Wen glaubst du [_&P [dass Peter Maria liebt] und [dass Max t schlägt]]?
            who believe you   that Peter Maria loves and that Max   beats
            Who do you think that Peter loves Mary and that Max beats?
        b.* Wen glaubst du [_&P [dass Peter t liebt] und [dass Max Klaus schlägt]]?
            who believe you   that Peter loves and that Max Klaus beats
            Who do you believe that Peter loves and that Max beats Klaus?
        c.* Wen glaubst du [_&P [dass Peter Maria liebt] und [schlägt Max t]]?
            who believe you   that Peter Maria loves and beats Max
            Who do you think that Peter loves Mary and that Max beats?
        d.* Wen glaubst du [_&P [liebt Peter t] und [dass Max Klaus schlägt]]?
            who believe you   loves Peter and that Max Klaus beats
            Who do you think that Peter loves and that Max beats Klaus?

Regarding coordination, similarly to regular wh-question extraction, wh-copying is available in ATB-contexts. Interestingly, a resuming element is permitted either in each coordinated clause or only in the first clause - having scope over both coordinated clauses – but not only in the second clause.

(43)   a. Wen glaubst du [_&P [dass Peter t liebt] und [dass Max t schlägt]]?
            who believe you   that Peter loves and that Max   beats
        b. Wen glaubst du [_&P [wen Peter t liebt] und [wen Max t schlägt]]?
            who believe you   who Peter loves and who Max   beats
        c. Wen glaubst du [_&P wen [Peter t liebt] und [Max t schlägt]]?
            who believe you   who Peter loves and Max   beats
        d.* Wen glaubst du [_&P [Peter t liebt] und wen [Max t schlägt]]?
            who believe you   Peter loves and who Max   beats
            Who do you think that Peter loves and that Max beats?

The WHAT-construction is sensitive to all these islands as well, with one notable exception: it is not constrained by the subject island.

(44)   a. Was ist dir aufgefallen [_Subject wen sie t eingeladen hat]?
            what is you apparent   who she invited   has
            Who was it apparent to you that she invited?

    b. Was hat alle überrascht [Subject wen sie t liebt]?
        what has all surprised   who she loves
        Who did that she loves surprise everyone?
    c. Was ist dir klar geworden [Subject wie du leben willst]?
        what is you clear become   how you live   want
        How did it become clear to you that you want to live?
    d. Was ist für alle offensichtlich [Subject wer der Mörder   ist]?
        what is for all obvious   who the murderer is
        Who is it obvious for everyone is the murderer?

All these examples are ungrammatical with both wh-copying and regular question extraction.

(45)   a.* Wen ist dir aufgefallen [Subject wen sie t eingeladen hat]?
           wen is you apparent   who she invited   has
        b.* Wen ist dir aufgefallen [Subject dass sie t eingeladen hat]?
           wen is you apparent   that she invited   has
        c.* Wen ist dir aufgefallen [Subject hat sie t eingeladen]?
           wen is you apparent   hat she invited
        Who was it apparent to you that she invited?
        d.* Wie ist dir klar geworden[Subject wie du t leben willst]?
           how is you clear become   how you live   want
        e.* Wie ist dir klar geworden[Subject dass du t leben willst]?
           how is you clear become   that you live want
        f.* Wie ist dir klar geworden[Subject willst du t leben]?
           how is you clear become   want you live
        How did it become clear to you that you want to live?
        g.* Wer ist für alle offensichtlich [Subject wer t der Mörder   ist]?
           who is for all obvious   who the murderer is
        h.* Wer ist für alle offensichtlich [Subject dass t der Mörder   ist]?
           who is for all obvious   that   the murderer is
        i.* Wer ist für alle offensichtlich [Subject ist t der Mörder]?
           who is for all obvious   is   the murderer
        Who is it obvious for everyone is the murderer?

Whatever is responsible for this difference[11], the very fact remains: the WHAT-construction shows peculiar island properties, whereas wh-copying and the regular extraction types show the typical island effects.

---

[11] Fanselow & Mahajan 2000, p. 201, suggest that the relevant factor is factivity, but this seems insufficient because all the predicates in (44) are factive. Incidentally, under an indirect dependency approach to the WHAT-construction (cf. Lutz et al. 2000 for an overview), the insensitivity to the subject island is expected. For what is extracted under this approach is the subject itself and not a subpart of it; and since subjects can be extracted in German quite easily, the data in (44) follow without further saying.

2.3.3 Interpretative Differences

2.3.3.1 *de re* / *de dicto* **Readings**

Rett 2006, p. 357, observes that wh-copying differs from the WHAT-construction but patterns like wh-question extraction regarding *de re* and *de dicto* readings. Whereas the speaker necessarily accepts the presupposition of the embedded clauses in the WHAT-construction, he is not committed to it in either wh-copying or wh-question extraction.

(46)   Context: I know that no one kissed Maria.
      a. Aber wer glaubt   Peter dass t Maria geküsst hat?
         but   who believes Peter that   Maria kissed has
      b. Aber wer glaubt   Peter wer t Maria geküsst hat?
         but   who believes Peter who Maria kissed has
      c. [#]Aber was glaubt   Peter wer t Maria geküsst hat?
         but   what believes Peter who Maria kissed has
         Who do you think Maria kissed?

In other words, wh-copying and the regular extraction types are ambiguous with respect to *de dicto* and *de re* readings, whereas the WHAT-constructions only allows for the *de re* reading. Again, wh-copying patterns with regular extraction, and not with the WHAT-construction.

2.3.3.2 Disjunctive and Conjunctive Interpretations

A further interpretative similarity between wh-copying and the regular extraction types shows up in coordination structures. Consider (46), featuring regular extraction.

(47)   [#]Wen glaubst du [[dass Hans t ermordete]   und [dass Hans nicht t tötete]]?
    who believe you that Hans assassinated and that Hans not   killed
    Who do you think that Hans assassinated and that Hans didn't kill?

As indicated by the judgment, this sentence is deviant. The reason for this is easy to identify: it asks for the person that was both assassinated by Hans and not killed by Hans. But since assassinating someone entails killing him, the presupposition of this question is contradictory. The same deviance is observed for wh-copying, but interestingly not for the WHAT-construction.

(48)   [#]Wen glaubst du [[wen Hans t ermordete]   und [wen Hans nicht t tötete]]?
    who believe you who Hans   assassinated and who Hans not   killed
    Who do you think that Hans assassinated and that Hans didn't kill?

(49) Was glaubst du [[wen Hans t ermordete]   und [wen Hans nicht t tötete]]?
      what believe you who Hans   assassinated and who Hans not   killed
      What do you think? Who did Hans assassinate and who didn't Hans kill?

So whereas (48) asks about a single person that was both assassinated and not killed,
(49) asks about two persons, one of which was assassinated and one of which was
not killed.

To conclude this section, I have shown that with respect to a number of properties
wh-copying patterns with the regular types of wh-question extraction, and differs
from the WHAT-construction. The differences between *wh*-question extraction out of
dass-clauses and wh-question extraction out of verb-initial clauses were shown to be
reducible to an independent property of the latter construction.

2.4   The Status of the Embedded Clause

In this section, I turn to a comparison between wh-copying and the WHAT-
construction. More precisely, the status of the embedded clause is investigated, that
is, the clause selected by the matrix predicate. The reason for the exclusion of the
regular extraction types relates to the fact that the status of this clause is
uncontroversial for them: they are embedded declarative clauses. This contrasts with
the status of the embedded clauses of wh-copying and the WHAT-construction
because these manifest an element in intermediate position, so that formally their
status is less clear. The claim I want to put forward in this section is that the status of
the embedded clauses in the two constructions is different. More specifically,
whereas the embedded clause in the WHAT-construction is formally an embedded
interrogative clause, the embedded clause in wh-copying shows no signs of
interrogativity.

The first difference shows up with respect to the *types* of embedded clauses. For
some speakers, the WHAT-construction is possible with an embedded yes/no-
question[12] (cf. Fanselow & Mahajan 2000, p. 214, fn. 10).

(50) Was glaubst du ob   sie kommt?
      what believe you whether she comes
      What do you think? Will she come?

Wh-copying, on the other hand, is always incompatible with embedded yes-no-
questions, whether targeted by extraction (cf. fn. 14) or not, cf. (51).

(51) *Wen glaubst du ob   sie t kommt?
      who believe you whether she comes
      Intended: *What do you think? Will she come?*

---

[12] This variety of German therefore patterns with Hindi and Kashmiri, whereas the standard variety of
German patterns with Marathi and Hungarian (Fanselow & Mahajan 2000; Horvath 2000).

The second difference relates to the *set* of wh-elements permitted in the two constructions. In the WHAT-construction, all types of wh-elements are permitted, independent of their phrasal status.

(52)   Was glaubst du   wen/welchen Mann sie t liebt?
        what believe you who/which   man   she loves
        Who/which man do you think she loves?

Wh-copying doesn't share this property: it only permits a restricted set of elements in intermediate position.

(53)   Wen glaubst du   wen/welchen Mann sie t liebt?
        who believe you who/which   man   she loves
        Who/which man do you think she loves?

The exact limitation of this set is the topic of the next chapter. Suffice it to say that broadly speaking, only pronominals are permitted as elements in intermediate position in wh-copying.
Third, since the WHAT-construction selects an embedded question, it follows that certain elements are excluded in intermediate position, viz. those lacking interrogative force.

(54)   a.* Was glaubst du   den   ich t sehe?
            what believe you that.one I   see
            Who do you think Hans sees?
        b.* Den   liebst du t?
            that.one love   you
            Who do you love?

The exclusion of *den* in (54a) is expected because it cannot introduce a question in general (54b). Wh-copying, however, is compatible – at least for some speakers – with elements such as *den* as elements in intermediate position.

(55)   Wen glaubst du   den Hans t sieht?
        who believe you who Hans   sees
        Who do you think Hans sees?

                                                          (McDaniel 1986, p. 183)

Again, the exact formulation of the constraint regulating the set of elements in intermediate position in wh-copying is the subject of the next chapter.
In sum, the status of the embedded clause in both wh-copying and the WHAT-construction reveals yet another peculiarity of the WHAT-construction: whereas the embedded clause in wh-copying and the regular extraction types is an embedded declarative clause, in the WHAT-construction it is an embedded interrogative clause.

2.5   Alleged Similarities between Wh-Copying and the WHAT-Construction

Finally I turn to a number of properties that have also been claimed to support the similarity between wh-copying and the WHAT-construction. I show that some of these properties do not hold exclusively for wh-copying and the WHAT-construction, but rather are shared by all extraction types, whereas others are based on too shaky a factual foundation to draw any decisive conclusion.

2.5.1   Factive Predicates

It has been observed that wh-copying is impossible with factive predicates.

(55)   a.* Wen bewies sie wen Fritz t liebt?
             who proved she who Fritz   loves
             Who did she prove that Fritz loves?

                                                    (Fanselow & Mahajan 2000, p. 219)

         b.* Wen bewies sie wen du   gesagt hast wen Fritz t getötet hat?
             who proved she who you said   have who Fritz   killed has
             Who did she prove that you said that Fritz killed?

Wh-copying shares this restriction with the WHAT-construction.

(56)   a.* Was bedauerst du   wen sie t liebt?
             what regret   you who she loves
             Who do you regret she loves?

                                                    (Fanselow & Mahajan 2000, ex. 59a)

         b.* Was weiß Hans mit wem Maria t reden wird?
             what knows Hans with whom Mary   talk   will
             Who does Hans know that Mary will talk to?

                                                                   (Stechow 2000, ex. 60)

This has been taken as an argument for a unified treatment of wh-copying and the WHAT-construction (for example, Fanselow & Mahajan 2000, Reis 2000). But this argument is flawed because regular extraction constructions are restricted in the same way.

(57)   a.* Wer hast du   bedauert dass t gekommen ist?[13]
             who have you   regretted that   come   is

---

[13] This example cannot be ungrammatical because of a that-trace violation as there are no detectable that-trace effects in those varieties of German licensing wh-question formation out of verb-final clauses in the first place (among others Grewendorf 1995, p. 1295; for a general discussion and a different view on that issue cf. Featherston 2007 and Haider 2007 for critique on that different view).

b.* Wer hast du bedauert dass t gekommen ist?
who have you regretted that   come   is
Who did you regret came?

(Stechow & Sternefeld 1988, p. 371)

(58) a.* Wen weiß Peter dass Maria t liebt?
who knows Peter that Mary   loves
b.* Wen weiß Peter liebt Maria t?
who knows Peter loves Mary
Who does Peter know Mary loves?

(Grewendorf 1988, p. 81)

(59) ??Wen weißt du   dass sie wirklich t liebt?
who know you that she really   loves
Who do you know she really loves?

(Cheng 2000, p. 95)

Since all types of extractions are sensitive to the same constraint, the argument from factive predicates that wh-copying and the WHAT-construction should receive a separate treatment, that is, one distinct from regular wh-question extraction structure, is therefore invalid[14].

2.5.2 Intervening Complementizers

A claim often found in the literature on wh-copying (Fanselow et al. 2005, p. 49; Felser 2004; Reis 2000) is that it doesn't permit intervening complementizers, that is, complementizers occupying a clause initial position that lies between the extracted element and the resuming element.

---

[14] Equally, all extraction construction types disallow matrix predicates selecting for an interrogative clause.
(i) a. *Wen fragst du wen (ob)   sie t liebt?
who ask   you who whether she loves
b. *Wen fragst du (ob)   sie t liebt?
who ask   you whether she loves
c. *Wen fragst du denn liebt sie t?
who ask   you then loves she
d. *Was fragst du wen (ob)   sie t liebt?
what ask   you who whether she loves
Who do you ask she loves?
Example c is grammatical without *denn*. This is due to the fact that wh-question extraction out of verb-second clauses is sometimes ambiguous to a structure involving parenthesis. Since parentheticals cannot host particles such as *denn*, the example includes it to force a non-parenthetical structure (cf. Pankau et al. 2010 for details).

(60)   a.* Wen sagt Peter dass Franz glaubt   wen sie t liebt?
            who says Peter that Franz believes who she loves
            Who does Peter say that Franz believes that she loves?
                                                                    (Reis 2000, p. 395)
        b.* Wen glaubst du   dass Peter meint wen Susi t heiratet?
            who believe you that Peter means who Susi   marries
            Who do you believe Peter thinks that Susi is marrying?
                                                                    (Felser 2004, p. 551)

Similar effect have been claimed to hold for the WHAT-construction (McDaniel 1986; Bayer 1996; Brandner 2000).

(61)   a.* Was glaubst du   dass Hans meint mit   wem   Jakob   t spricht?
            what believe you that Hans thinks with whom Jakob   speaks
            Who do you believe Hans thinks that Jakob is talking to?
                                                    (McDaniel 1986, p. 118; Bayer 1996, p. 228)
        b.* Was glaubst du dass Hans meint wem er das Auto t verkaufen soll?
            what believe you that Hans thinks who he the car   sell   should
            Who do you believe Hans thinks that he should sell the car to?
                                                                    (Brandner 2000, p. 51)

This argument would of course indicate a striking similarity between the WHAT-construction and wh-copying only, because regular extraction does of course permit intervening complementizers, due to its unboundedness (cf. ex. 7a). However, this argument is problematic for two reasons. First, some speakers do allow intervening complementizers in wh-copying.

(62)   a. Wen glaubt   John wen Hans meint dass Mary t getroffen hat?
           who believes John who Hans means that Mary   met   has
        b. Wen glaubt   John dass Hans meint wen Mary t getroffen hat?
           who believes John that Hans means who Mary   met   has
           Who does John believe that Hans thinks that Mary met?
                                                                    (Rett 2006, p. 356)

Second, it is not true that the WHAT-construction generally disallows intervening complementizers. It was Höhle 2000 who first[15] pointed out that intervening complementizers are not ungrammatical for all speakers (for similar judgments cf. Müller 1997; Fanselow & Mahajan 2000; Reis 2000).

(63)   a. Was glaubst du   dass Karl meint wen wir t gewählt haben?
           what believe you that Karl means who we   elected have
           Who do you believe Karl thinks that we have elected?
                                                                    (Höhle 2000, p. 251)

---

[15] The reason I take Höhle 2000 the first one and not Müller 1997 is that Höhle's paper is based on talks from 1989-1990.

    b. Was meinst du   dass sie gesagt hat wann sie t kommen würde?
        what mean you that she said   has when she come   would
        When do you think she said that she would come?

                                        (Müller 1997, p. 253)

    c. Was meinst du dass sie glaubt   wen Fritz t liebt?
        what means you that she believes who Fritz   loves
        Who do you think she believes that Fritz loves?

                              (Fanselow & Mahajan 2000, p. 212)

    d. Was glaubt   Peter dass Franz jetzt meint wohin   Elke t geht?
        what believes Peter that Franz now means where-to Elke   goes
        Where does Peter think Franz believes that Elke is going?

                                        (Reis 2000, p. 380)

What do these data then show? I suggest that they actually show a general feature of *all* extraction types, viz. that a long distance extraction allows the mixing of the different extraction strategies. In other words, the intervening complementizers in (62) and (63) are actually a reflex of the fact that extraction out of *dass*-clauses is mixed with wh-copying (ex. 62) and with the WHAT-construction (ex. 63). There is independent evidence for this analysis of the data in (61) and (62) coming from mixtures of other types of extraction structures. First, extraction out of *dass*-clauses can also mix with extraction out of verb-initial clauses.

(64)   a. Wer glaubst du   meinte Frieda dass Franz sagte dass Emma t liebt?
          who believe you meant Frieda that Franz said that Emma   loves
          Who do you think Frieda believes that Franz said Emma loves?

        b. Wer glaubst du meinte Frieda sagte Franz dass Heinrich denkt dass t Emma liebt?
          who believe you meant Frieda said Franz that Heinrich thinks that   Emma loves
          Who do you think Frieda believes Franz said Heinrich thinks Emma loves?

                                        (Bayer 1984, p. 271)

    c. Wer sagte sie glaube er dass t ihm seine Arbeit hier bezahlen werde?
        who said she believe he that   him his   work here pay   will
        Who did she say he believes will pay his work here?

                                        (Haider 1993, p. 187)

Second, the WHAT-construction can also mix extraction out verb-initial clauses.

(65)   Was glaubst du   hat der Vater gesagt wer t kommt?
        what believe you has the father said   who comes
        Who do you think father said will come?

                                        (Bayer 1984, p. 272)

Third, wh-copying can also mix with wh-question extraction out of verb-initial clauses.

(66)   a. Wen glaubst du   meint er wen sie t gesehen hat?
          who believe you means he who she   seen   has

   b. [?]Wen glaubst du wen er meint hat sie t gesehen?
      who believe you who he means has she   seen
      Who do you think he believes she has seen?

Fourth, the WHAT-construction and wh-copying can mix[16].

(67)   Was glaubst du wen sie denkt wen er t gesehen hat?
        what believe you who she thinks who he   seen   has
        Who do you believe she thinks he has seen?

What remains to be explained is why there is consensus in the literature about the well-formedness of the examples in (63)-(65), but not of the examples in (62)[17]. This difference can be explained by recourse to an independent factor, viz. whether or not a speaker accepts wh-question extraction out of verb-final clauses in addition to wh-copying. A familiar feature of German is that wh-question extraction out of *dass*-clauses is not grammatical for all speakers of German[18]. Additionally, it has also been claimed that wh-copying is a repair strategy for speakers not accepting wh-question extraction out of *dass*-clauses (Fanselow & Cavar 2001, p. 127)[19]. This claim has its roots in two coincidences. First, the earliest discussion of wh-copying in German (McDaniel 1986) reported precisely this: grammaticality of wh-copying, ungrammaticality of wh-question extraction out of *dass*-clauses. Second, wh-copying was later investigated with speakers of the Berlin-Brandenburg area (Fanselow & Mahajan 2000; Fanselow & Cavar 2001) who are well-known for their rejection of wh-question extraction out of *dass*-clauses (Fanselow et al. 2005). However, most speakers I consulted for my data collections were not from the Berlin-Brandenburg area and the majority of them accepted both wh-copying and wh-question extraction out of *dass*-clauses. Most importantly, all the speakers employing both types of extraction accepted intervening complementizers, whereas none of speakers employing only wh-copying accepted it. In other words, only the speakers accepting wh-question extraction out of *dass*-clauses also accepted

---

[16] This is only possible when the *was* appears higher than all the elements corresponding to the questioned constituent.
(i) *Wen glaubst du was sie denkt wen er t gesehen hat?
     who believe you what she thinks who he   seen   has
     Who do you believe she thinks he has seen?
[17] The examples in (66) und (67) haven't been discussed before; all my informants however share these judgments.
[18] It is fair to say that the nature of this difference is not understood, judging from the curious development its description has undergone in the literature. Wh-question extraction out of verb-final clauses was first considered at best substandard (Tappe 1981, p. 204), was then taken to be a feature of Bavarian (Bayer 1984), later turned into a general feature of Southern German (Grewendorf 1988, p. 260; Grewendorf 1995, p. 1295; Lühr 1988, p. 75), was subsequently assumed to be a general feature of German not licensed in the Northern varieties (Fanselow & Felix 1987, 175), and was finally assumed to be grammatical in all dialects of German, and only being an unrealized option in some of them (Fanselow et al. 2005, p. 60).
[19] Bayer 1984, p. 272, also assumes that wh-copying has the flavour of a repair strategy, although for reasons independent of the availability of wh-question extraction out of *dass*-clauses.

intervening negation. That is, the grammaticality of (68a) is a necessary condition for the grammaticality of (68b) or (68c)[20].

(68) a. Wen glaubst du   dass er meint dass sie t gesehen hat?
        who believe you that he means that she seen   has
     b. Wen glaubst du   wen er meint dass sie t gesehen hat?
        who believe you who he means that she seen   has
     c. Wen glaubst du   dass er meint wen sie t gesehen hat?
        who believe you that he means who she seen   has
        Who do you think he believes she has seen?

The exceptional status of the examples in (62) is therefore simply due to a historical coincidence in the description of wh-copying.

In sum, intervening complementizers are not an argument for any special similarity between wh-copying and the WHAT-construction. They are part of a broader feature of German extraction constructions, viz. the feature that mixing of distinct extraction constructions is generally allowed[21].

2.5.3   Consistent vs. Inconsistent Readings

A further argument put forward for the exclusive similarity of wh-copying and the WHAT-construction is their behavior with respect to what Reis 2000 calls *consistent* and *inconsistent* readings. Consider the sentences in (69).

(69) a. Wo   ist Fox t populärer   als er ist?
        where is Fox more.popular than he is
        Where is Fox more popular than he is?
     b. Wo   glaubt Maria dass Fox t populärer   ist als er ist?
        where believes Maria that Fox more.popular is than he is
        Where does Maria believe that Fox is more popular than he is?

Example (69a) only has a reading in which the speaker believes at the same time that Fox is popular to some degree y at place x and to some degree z such that $z > y$. It can be paraphrased roughly like in (70), following Reis 2000, pp. 383-4, and Stechow 2000, p. 468.

(70)   For which place x is it the case that in the speaker's belief worlds, Fox is more popular at x than Fox is popular at x.

---

[20] More generally, the mixing of two extraction types requires that both are available in the first place.

[21] Although mixing doesn't seem to be preferred by the speakers. Höhle 2000, p. 252, already pointed out that "[m]any speakers who use both long extractions and the was-construction reject 'mixed' examples." In addition, both Haider 1993, p. 187, and Bayer 1984, p. 271, point out that mixing is subject to idiosyncratic constraints. The same is true for wh-copying (cf. the contrast between (66a) and (66b)).

As this is an inconsistent belief, the sentence is said to have an inconsistent reading. Interestingly, example (69b) is ambiguous. It can have an inconsistent reading, but it can also have a consistent reading because the inconsistent beliefs can be assigned to different sources, to the speaker or to the subject of the matrix clause. The inconsistent reading for (69b) is given in (71a), the consistent one in (71b).

(71)   a.   For which place x is it the case that in Maria's belief worlds Fox is more popular at x than Fox is popular at x.
       b.   For which place x is it the case that in Maria's belief worlds Fox is more popular at x than Fox is popular at x in the speaker's belief worlds.

The relevant question is of course how wh-copying and the WHAT-construction pattern, that is, whether they allow for the consistent reading or only for the inconsistent one. The relevant sentences are given in (72).

(72)   a.   Was glaubt Maria wo   Fox t populärer   ist als er ist?
            what believes Maria where Fox more.popular is than he is
       b.   Wo   glaubt Maria wo   Fox t populärer   ist als er ist?
            where believes Maria where Fox more.popular is than he is
            Where does Maria believe that Fox is more popular than he is?

According to Reis 2000, p. 395, both the WHAT-construction and wh-copying allow an inconsistent reading only. This would strongly indicate a similarity between the two constructions because regular extraction[22] is ambiguous. However, judgments vary. Rett 2006, p. 357, observes that wh-copying does have a consistent reading for her informants contrary to the WHAT-construction. The present author also considers wh-copying ambiguous and the WHAT-construction unambiguous. Given this variation which points in either direction (wh-copying patterns/does not pattern with the WHAT-construction), the argument remains indecisive.

2.5.4   Individual vs. Pair List Readings

The last argument used to show that wh-copying and the WHAT-construction pattern alike comes from individual and pair list readings. Consider (73).

(73)   Wo   glaubt jeder   dass der beste Wein t wächst?
       where believes everyone that the best wine   grows
       Where does everyone believe that the best wine grows?

---

[22] Although Reis didn't discuss it, extraction out of verb-initial clauses also has a consistent reading.
(i)   Wo   glaubt Maria ist Fox t populärer   als er ist?
      where believes Maria is Fox more.popular than he is
      Where does she believe that Fox is more popular than he is?

This sentence is ambiguous. It either asks for the unique place x such that everyone thinks that the best wine grows at x (that is, *where* scopes over *everyone*). Or it asks for the belief of everyone concerning some place x such that everyone believes that the best wine grows at x (that is, *everyone* scopes over *where*). The first reading is called the *individual reading*, the second one the *pair list reading*. Similar to the consistent and inconsistent reading, the issue surrounds the ambiguity of wh-copying and the WHAT-construction.

(74) a. Wo   glaubt jeder   wo   der beste Weint wächst?
          where believes everyone where the best wine grows
      b. Was glaubt jeder   wo   der beste Weint wächst?
          what believes everyone   where the best wine grows
          Where does everyone believe that the best wine grows?

According to Felser 2004, p. 557, wh-copying and the WHAT-construction only allow the pair list reading. But in this case also, the judgments are subject to massive variation. Both Rett 2006, p. 357, and Stechow 2000, p. 467, consider wh-copying as ambiguous as regular extraction, whereas the WHAT-construction only has a pair-list reading. Pafel 2000, p. 340, shares these judgments. Here again then the judgments vary to such an extent that no decisive conclusion can be drawn.

2.5.5   Other Properties

Apart from these properties that have been used explicitly to support the idea of a deep similarity between wh-copying and the WHAT-construction, some authors have also pointed to general characteristics shared by the wh-copying and the WHAT-construction. I briefly review these now.
Höhle 2000, pp. 253-4 mentions in total five properties.

(75) a. There is extraction out of an embedded clause.
      b. The matrix clause is a question.
      c. The matrix predicate selects only non-interrogative complement clauses.
      d. The matrix predicate permits a nominal expression in place of or in addition to the embedded clause.
      e. The embedded clause is formally a wh-interrogative clause.

The first four properties are certainly true but they are so general as to apply to *any* German wh-question extraction (for examples regarding the exclusion of interrogative complement clauses, cf. fn. 14). The last property, on the other hand, is arguably false for wh-copying, as shown in section 4 of this chapter.
Apart from three properties already discussed (intervening complementizers, the exclusion of interrogative complement clauses, the (alleged) exclusion of embedded yes/no questions), Brandner 2000, pp. 50-2, discusses four more properties shared by wh-copying and the WHAT-construction.

(76) a. No I°-to-C° movement must take place in the embedded clauses
      b. The matrix clause must not contain other wh-elements.
      c. The WHAT-construction is restricted to extractions out of embedded clauses.
      d. The *was* in the WHAT-construction must not appear below the questioned constituent.

The first property centers on the contrast in (77).

(77) a. Was glaubst du   wen sie t liebt?
          what believe you who she loves
      b.* Was glaubst du   wen liebt sie t?
          what believe you who loves she
          Who do you think she loves?

This restriction is in fact shared by the corresponding wh-copying sentences.

(78) a. Wen glaubst du   wen sie t liebt?
          who believe you who she loves
      b.* Wen glaubst du   wen liebt sie t ?
          who believe you who loves she
          Who do you think she loves?

But this argument is fallacious because it is a general property of embedded clauses targeted by extraction that they disallow I°-to-C° movement in case something else already occupies the pre-subject position.

(79) a. Wen glaubst du   dass sie t liebt?
          who believe you that she loves
      b.* Wen glaubst du   dass liebt sie t ?
          who believe you that loves she
          Who do you think she loves?

So this property is not a distinctive property of wh-copying and the WHAT-construction, but rather applies to embedded clauses targeted by extraction in general.
The next property concerns the ungrammaticality of the sentences in (80), due to the presence of another wh-element in the matrix clause, viz. *wann* (Engl. when).

(80) a.* Was hat Hans wann gesagt wem er t das Auto verkaufen wird?
          what has Hans when said   who he the car   sell   will
          Who did Hans say when that he will sell the car to?
      b.* Wem hat Hans wann gesagt wem er t das Auto verkaufen wird?
          who has Hans when said   who he the car   sell   will
          Who did Hans say when that he will sell the car to?

Again, this property is not distinctive. The corresponding sentences with regular extractions are of course long distance extractions; but long distance extraction in German has been observed to be subject to superiority in general, cf. (81).

(81)   a.* Wen glaubt   wer dass Hans t gesehen hat?
             who believes who that Hans   seen   has

                                                             (Grewendorf 2002, p. 235)

        b.* Wen glaubt   wer hat Hans t gesehen?
             who believes who has Hans   seen
             Who does who believe Hans has seen?

The third property – sometimes also dubbed anti-locality – relates to the observation that both wh-copying and the WHAT-construction are impossible in simple, unembedded constituent questions.

(82)   a.* Was liebt er wen?
             what loves he who
        b.* Wen liebt er wen?
             who loves he who
             Who does he love?

With respect to this property, the two constructions in fact cluster together because simple wh-question extractions are of course possible.

(83)   Wen liebt er t?
        who loves he
        Who does he love?

Despite the correctness of this observation, the ungrammaticality of (82a) is due to something different than that of (82b). The ungrammaticality of (82b) is simply due to the fact that wh-copying generally disallows the additional realization of an element corresponding to the extracted constituent in the base position[23]. This constraint is violated in (82b). The ungrammaticality of (82a) on the other hand is more an artefact of an analysis in which the *was* in the WHAT-construction is analyzed as being directly connected to the wh-phrase in intermediate position, viz. by analyzing the *was* as a spell out of the extracted [+wh]-feature. If however only an indirect connection is assumed in which the *was* must bind a propositional variable whose range is provided by the embedded question, then the problem relating to (82a) disappears: in that example, *was* fails to bind such a variable[24].
The last property – that *was* must not appear below any spell-out of the questioned constituent – is illustrated in (84).

(84)   a. Was glaubst du   was Maria denkt wen Peter eingeladen hat?
             what believe you what Maria thinks who Peter invited   has

---

[23] I discuss this issue in more detail in the next chapter.
[24] For further discussion, cf. Lutz et al. 2000.

b.* Was glaubst du   wen Maria denkt was Peter eingeladen hat?
      what believe you   who Maria thinks what Peter invited   has
c.* Wen glaubst du   was Maria denkt was Peter eingeladen hat?
      who believe you   what Maria thinks what Peter invited   has
      Who do you think Peter says Maria has invited?

Although undoubtedly correct, it remains unclear how this property of the WHAT-construction can possibly be shared by wh-copying. For it restricts the distribution of an element that is special to the WHAT-construction, viz. the element *was*.

In sum, a number of arguments supporting the similarity between wh-copying and the WHAT-construction have been shown to be invalid. They either apply to all extraction types, or they are based on judgments that are too shaky to warrant any firm conclusion about an exclusive similarity between wh-copying and the WHAT-construction.

2.6   Summary

I have argued in this chapter that wh-copying should be separated from the WHAT-construction. In particular, I have shown two things. First, wh-copying never patterns exclusively with the WHAT-construction. That means that there is no property x shared by wh-copying and the WHAT-construction, and not shared by the other regular extraction types. Second, in cases where a property x is shared by both wh-copying and the WHAT-construction, x is not an exclusive feature of the two types. Rather, in all these cases, x is a property of wh-question extraction in German in general. Therefore, analyzing wh-copying and the WHAT-construction identically is not warranted. The table below gives a summary of the properties investigated in this chapter plus the result for each extraction type.

Property	Wh-Copying	Wh-dass	WHAT
Volitional predicates	*sometimes permitted*		*never permitted*
Negated predicates	*sometimes permitted*		*never permitted*
Raising Predicates	*permitted*		*not permitted*
Island Effects	*typical*		*atypical*
de re / de dicto Ambiguity	*ambiguous*		*unambiguous*
ATB Ambiguity	*unambiguous*		*ambiguous*
Status of the Embedded Clause	*declarative*		*interrogative*
Factive Predicates	*never permitted*		
Intervening Complementizers	*general mixing*		
Consistent / Inconsistent	*unclear*		
Scope Ambiguities	*unclear*		

Table 1: Comparison of the properties of wh-copying, wh-question extraction out of dass-clauses (wh-dass), and the WHAT-construction (WHAT)

Chapter 3

The Properties of the Resuming Element

3.1 Introduction

I have argued in the previous chapter that wh-copying behaves in all respects like a regular extraction construction. The only difference between wh-copying (cf. 1a) and the other regular extraction types (cf. 1b) is the presence of what I earlier called the resuming element, that is, the element underlined in (1a).

(1) a. **Wen** glaubst du <u>wen</u> sie t liebt?
         who believe you who she loves
     b. **Wen** glaubst du dass sie t liebt?
         who believe you that she loves
         Who do you think she loves?

The challenge for any analysis of wh-copying is therefore an adequate treatment of the resuming element. In other words, any treatment should deal with the question of *how* this element is grammatically permitted. But apart from answering that question, such a treatment must additionally deal with two other questions. First, there is the issue of *what* is permitted as a resuming element, and second that of *where* this element is permitted. That is, any analysis of wh-copying has to specify:

(2) (i) What constitutes the set of resuming elements?
     (ii) What is the position of the resuming element?

The purpose of this chapter is to investigate these two questions in more detail, although the emphasis is on the first, for two reasons. First, the second question has already been investigated and given a satisfactory answer, and I only review the arguments for it. Second, and more importantly, no comparable investigation has been undertaken for the first question. This does not mean that answers to it haven't been proposed. In fact, the literature abounds in answers which, however, differ widely from each other, as I will show. This indicates that the data base on which the answers have been based so far is too narrow. The aim of this chapter is to

demonstrate that by expanding the data base, a satisfactory answer to the first question is possible, filling the blank spot on the map of wh-copying.

I show on the basis of mainly new data is that the resuming element is a *proform*, more precisely, a *free relative proform*, and that it has to *agree* with the extracted element, in a sense to be specified.

The chapter is organized as follows. In section 2, I discuss the position of the resuming element. In section 3, I give an overview of previous characterizations of the resuming element, and in section 4, I present new data showing that the resuming element is a proform, that it is a free relative proform, and I discuss its agreement properties. In section 5, I then turn to some diachronic arguments supporting the status of the resuming element as a free relative proform. In section 6, I reconsider the status of the embedded clause in wh-copying in light of the status of the resuming element as a free relative proform. I consider data that seem to cause some trouble for the characterization of the resuming element as a free relative proform in section 7, and discuss some implications of the characterization of the resuming element in section 8. Section 9 is the conclusion.

3.2   The Position of the Resuming Element

The position of the resuming element is well-established. As was first pointed out by Fanselow & Cavar 2001, p. 122, the resuming element appears in the initial position of a clause (cf. 3a), and never in the position of the gap (cf. 3b and 3c).

(3)   a. **Wen** glaubst du   <u>wen</u> sie t liebt?
             who believe you who she loves
        b.* **Wen** glaubst du   <u>wen</u> sie <u>wen</u> liebt?
             who believe you who she wen loves
        c.* **Wen** glaubst du   dass sie <u>wen</u> liebt?
             who believe you that   she wen loves
             Who do you think she loves?

McDaniel 1986 additionally observed that the resuming element is banned from the initial position in infinitives (cf. 4).

(4)   * **Wen** versuchst du   <u>wen</u> t anzurufen?
          who try   you who   to.call
          Who do you try to call?

                                                                                    (McDaniel 1986, p. 184)

The generalization covering all these cases is fairly simple and stated in (5).

(5)   POSITION OF THE RESUMING ELEMENT
         The resuming element occupies a clause left peripheral position.

What I mean by *clause left peripheral position* is the position hosting extracted elements. This generalization was already formulated by Fanselow & Cavar 2001, p. 122[1]. Two arguments support the clause peripheral position of the resuming element. The first comes from *weak* (that is, unstressed) *subject pronominals*. In contrast to other elements, such as full NPs and weak object pronominals, weak subject pronominals occupy a fixed position in embedded clauses and cannot be rearranged with respect to other elements. The only elements that are allowed to immediately precede weak subject pronominals are complementizers (cf. 6a) and extracted elements (cf. 6b), but not objects, for example (cf. 6c).

(6)   a. Ich sage dass sie den Mann liebt.
        I   say that she the man   loves
        I say that she loves the man.
    b. Ich sage wen sie t liebt.
        I say who she loves.
    c.* Ich sage dass den Mann/ihn sie liebt.
        I   say that the man/ him she loves
        I say that she loves the man.

Under the assumption that the resuming element occupies a clause peripheral position, one can nicely account for the well-formedness of (7).

(7)   **Wen** sagst du <u>wen</u> sie t liebt?
      who says you who she loves
      Who do you say she loves?

The well-formedness of (7) does not follow from the assumption that the resuming element is simply reordered with respect to the weak subject pronominal. For then it would be expected to be as ungrammatical as (6c). But since it occupies the same position as the extracted element in (6b), the well-formedness of (7) is accounted for by the generalization in (5). This argument is supported by the observation that the resuming element cannot occupy positions otherwise available for reordered objects, like a VP-peripheral position (*wohl* marks the left edge of VP in German, cf. Diesing 1992).

(8)   a. Ich sage dass sie ihn wohl   t liebt.
        I   say that she him probably   loves
        I say that she probably loves him.
    b.* **Wen** sagst du dass sie <u>wen</u> wohl   t liebt?
        who say   you that she who probably   loves
        Who do you say she probably loves?

The non-occurrence of resuming elements in infinitives follows easily as German generally lacks the relevant position for extracted element in infinitives[2]: German has neither infinitival wh-questions nor infinitival relative clauses (cf. Tappe 1984a).

---

[1] This position corresponds to SpecCP within the framework adopted by Fanselow & Cavar 2001.

(9)   a.* Ich frage mich wen t anzurufen.
              I   ask   me   who   to.call
              I wonder who to call.
         b.* Das ist ein Mann mit dem t zu arbeiten.
              That is a man with whom to work.

The second argument for the clause peripheral position of the resuming element is that some speakers accept a resuming element immediately to the left of a complementizer.

(10)   a. **Wen** meinst du <u>wen</u> dass er gesagt hat <u>wen</u> er angerufen hat?
             who mean   you who that he said   has who he called   has
             Who do you think he said that he called?

                                                        (Bayer 1996, p. 249)

         b. **Wer** glaubst du <u>wer</u> dass du t bist?
             who believe you who that you   are
             Who do you think you are?

                                                (Fanselow & Mahajan 2000, p. 222)

As both Bayer 1996 and Fanselow & Mahajan 2000 point out, this cooccurrence is possible only for speakers who generally allow the clause peripheral and the complementizer position to be overtly filled at the same time. That is, whenever speakers allow the sentences in (10), they also allow the one in (11).

(11)   Ich weiß nicht wer dass t kommt.
         I   know not   who that   comes
         I don't know who comes.

                                                (Fanselow & Mahajan 2000, p. 222)

In other words, only speakers accepting the cooccurrence of an extracted phrase and a complementizer also accept the cooccurrence of the resuming element and a complementizer. This state of affairs of course follows if the resuming element occupies a clause peripheral position but not if it is assumed to occupy some clause internal position.

Before I turn to the characterization of the resuming element, I briefly return to an issue touched upon in the previous chapter in footnote 7, viz. that certain islands are impossible to test for wh-copying. More precisely, what is untestable are adjunct clauses and relative clauses. The property of resuming element to occupy a clause peripheral position is responsible for this. Adjunct clauses require an overt complementizer marking the adverbial function borne by the clause.

---

[2] Alternatively, if infinitives have such a position it must not be filled overtly in German (Giusti 1986; Sabel 1996). This does not affect the argument according to which *wh*-copying is excluded from infinitives due to independent reasons because the resuming element would count as an overt filler under the alternative proposal.

(12)   Peter ist eingeschlafen [*(als/   während/weil)   der Tenor die Arie sang]
       Peter is fell.asleep   when/while/   because the tenor the aria sang
       Peter fell asleep when/while/because the tenor sang the aria.

Wh-copying on the other hand requires a resuming element in clause peripheral position. Both requirements cannot be fulfilled simultaneously because both the clause peripheral and the complementizer position cannot be simultaneously overtly filled in most varieties of German. Circumventing this constraint by simply deleting one of them on the other hand is impossible as well, as both elements are independently required. Therefore, the ungrammaticality of (13) is unrevealing because the sequence *was als* itself is already not well-formed.

(13) * **Was** ist Peter eingeschlafen [was während/weil/   als   der Tenor t sang]?
       what is Peter fell.asleep   what when/   because/while the tenor   sang
       What did Peter fall asleep when/while/because the tenor sang?

This conflict cannot be resolved even in those varieties of German that do allow the clause peripheral and the complementizer position to be overtly filled at the same time (Bettina Gruber, p.c., 2011/03/16). For even in such varieties, the coccurrence is restricted to the simple declarative complementizer *dass* or the relative complementizer *wo* or *was*. Consequently, even there structures such as (13) shed no light on the island status of adjunct clauses. The same problem shows up in relative clauses, although their island status might be investigated in those varieties allowing the clause peripheral and the complementizer position to be overtly filled simultaneously. German relative clauses differ from English ones in that they are always introduced by a relative pronoun.

(14)   Maria liebt den Mann [*(den) ich ihrem Vater t vorgestellt habe].
       Maria loves the man   who I   her   father introduced have
       Mary loves the man (who) I introduced to her father.

Again, this requirement and the requirement of wh-copying are in conflict, but this time for a different (though similar) reason: German does not permit two extracted phrases in one clause. As with adjunct clauses, this conflict cannot be dissolved by deleting one of them as both elements are independently needed. Consequently, the ungrammaticality of (15) is unrevealing because the cooccurrence of the two extracted phrase already makes the structure ungrammatical, irrespective of where their gaps originate.

(15) * **Wem** liebt Maria den Mann [wem$_1$ den$_2$ ich t$_1$ t$_2$ vorgestellt habe].
       who   loves Maria the man   who   who I   introduced have
       Who does Mary love the man (who) I introduced to?

Interestingly, the varieties mentioned earlier that allow the clause peripheral and the complementizer position to be overtly filled at the same time do however provide evidence for the island status of relative clauses. In these dialects, it is possible to have relative clauses introduced by a relative complementizer *wo* or *was* alone

(Bayer, 1984; Bettina Gruber, p.c., 2011/03/16). That is, sentence (16b) is in free variation with the one in (16a).

(16)   a. Ich denke an die Frau   [die$_i$ was t$_i$ den Mann gesehen hat].
            I   think   on the woman who what   the man   seen   has
        b. Ich denke an die Frau   [was t$_i$ den Mann gesehen hat][3].
            I   think   on the woman what   the man   seen   has
            I think of the woman who has seen the man.

If (16b) does not involve deletion of a relative pronoun but simply the non-presence of it then it becomes possible to test the island status of relative clauses. Since this variety of German also allows the clause peripheral and the complementizer position to be overtly filled at the same time, the clause peripheral position left to the relative complementizer is in principle available for the resuming element in (16b). But in fact, it is not: the version of (16b) involving wh-copying with the extracted element originating inside the relative clause is strongly ungrammatical (Bettina Gruber, p.c., 2011/03/16).

(17)   * **Wen** denkst du   an die Frau$_i$ [wen was$_i$ t gesehen hat]?
            who think   you on the woman who what   seen   has
            Who did you think of the woman who has seen?

As no other constraint is violated (*was* in (17) is not an extracted phrase but a complementizer, so it is not excluded due to the presence of two extracted elements), it is the extraction out of the relative clause itself that causes the ungrammaticality.
In sum, the position of the resuming element can be clearly identified as clause peripheral.

3.3   Previous Characterizations of the Resuming Element

As already said in the introduction to this chapter, the literature on *wh*-copying offers many different answers to the question of what constitutes the set of resuming elements. I present these answers in this section. If possible, I also give their empirical motivations, but I don't deal with the specific analyses in which these answers are embedded. A full discussion of the analyses is provided in the next chapter, where I evaluate them in light of the characterization of the resuming element arrived at in this chapter.
In total, seven answers have been given to the question concerning the defining features of the set of resuming elements.

---

[3] The subscript on the complementizer *was* is only meant to indicate that it is somehow connected to the head noun *Frau*, without making any specific claims as to how this connection is eventually established.

The first and by far most widely assumed answer, is that the resuming element is an *interrogative wh-phrase*, and more specifically, *an interrogative wh-phrase that is identical to the extracted element*. That is, the element underlined in (18) and the element in bold in (18) are not only phonologically identical, but fully.

(18) **Wen** glaubst du   wen sie t liebt?
       who believe you who she loves
       Who do you think she loves?

This answer has been adopted by a number researchers for German wh-copying (Anyadi & Tamrazian 1993; Fanselow & Mahajan 2000; Fanselow & Cavar 2001; Höhle 2000; Nunes 2001, 2004; Pafel 2000; Rett 2006), and basically by all researchers analyzing wh-copying in other languages, such as Afrikaans (Plessis 1977), Dutch (Barbiers et al. 2010), Frisian (Hiemstra 1986a, 1986b), Passamaquoddy (Bruening 2006), Punjabi (Yang 2008), and Tyrolean German (Alber 2008).

The second answer proposed is that the resuming element is the extracted element *minus the extracted element's [+wh]-feature* (cf. Pankau 2009). This characterization is based on two observations. First, bridge verbs such as *glauben* don't permit clauses introduced by [+wh]-bearing elements (cf. 19a); consequently the resuming element must not bear such a feature either. Second, embedded interrogative clauses are generally excluded from wh-copying (cf. 19b), which fact is hard to account for if the embedded clause in wh-copying contains an element that is identical the wh-element in the embedded question in (19b).

(19) a.* Ich glaube wen Maria t liebt.
          I   believe who Maria   loves
          I believe who Maria loves.
      b.* **Wen** fragst du   wen sie t liebt?
          who ask   you who she loves
          Who do you ask she loves?

The third answer that has been proposed is that the set of resuming elements consists of *indefinite pronouns* (Felser 2004, pp. 558-9). This answer takes the phonological identity between the extracted element and the resuming element in (18) to be related to the fact that elements such as *wen* can also be used as indefinites in German.

(20) Ich habe gestern   wen gesehen.
      I   have yesterday who seen
      I have seen someone yesterday.

The fourth answer that has been put forward is that the resuming element is a *relative pronoun* (Koster 2009, p. 15). This idea is based mainly on data from Dutch, which also has wh-copying (cf. 21a), and where elements such as *wie* can also be used as relative proforms (cf. 21b).

(21)   a. **Wie** denk je   <u>wie</u> ik gezien heb?
           who think you who I   seen   have
           Who do you think I have seen?

(Koster 2009, ex. 8)

       b. Dat is de man <u>wie</u> ik het boek gaf.
           that is the man who I   the book gave
           That is the man who I gave the book to.

The fifth answer takes it that the set of resuming elements consists of both *definite and indefinite pronouns* (Barbiers et al. 2010, p. 10). The main motivation for this claim is that wh-copying in Dutch allows not only wh-phrases as resuming elements (cf. 21a), but also d-pronouns (cf. 22a), which are also used as relative pronouns (cf. 22b).

(22)   a. **Wie** denk je   <u>die</u> ik gezien heb?
           who think you who I   seen   have
           Who do you think I saw?

(Barbiers et al. 2010, ex. 4)

       b. Dat is de man <u>die</u> ik het boek gaf.
           that is the man who I   the book gave
           That is the man who I gave the book to.

The sixth answer claims that the set of resuming elements contains both *wh-pronouns and relative pronouns* (McDaniel 1986, p. 181). McDaniel gives two observations as support for her claim. First, as in Dutch, some German speakers permit d-pronouns as resuming elements (cf. 23a), which elements are also used as relative pronouns (cf. 23b).

(23)   a. **Wen** glaubst du   <u>den</u> Hans t sieht?
           who believe you who Hans   sees
           Who do you think Hans sees?

(McDaniel 1986, p. 183)

       b. Das ist der Mann <u>den</u> ich t sehe.
           that is the man   who I   see
           That's the man I see.

Second, she points out that full NPs, that is, non-pronouns, are not permitted in wh-copying.

(24)   * **Wessen Buch** glaubst du   <u>wessen Buch</u> Hans t liest?
           whose   book believe you whose book Hans   reads
           Whose book do you think Hans reads?

(McDaniel 1986, p. 183)

Finally, answer seven takes the resuming element to actually be a *complementizer*, more specifically, *an agreeing complementizer* (cf. Thornton 1990; Kampen 1997). This answer is motivated by the fact that the resuming element is restricted to the

clause peripheral positition (cf. 25a), which fact is mirrored by the distribution of complementizers (cf. 25b)

(25)   a.   **Wen** glaubst du   <u>wen</u> sie (*<u>wen)</u> liebt?
            who believe you who she   wen loves
            Who do you think she loves?
       b.   Ich glaube <u>dass</u> sie ihn (*dass) liebt.
            I   believe that she him   that   loves
            I think she loves him.

The answers are summarized in (26)

(26)   The set of resuming elements consists of
       a.   interrogative wh-phrases
       b.   wh-phrases lacking a [+wh]-feature
       c.   indefinite pronouns
       d.   relative pronouns
       e.   definite & indefinite pronouns
       f.   wh-pronouns & relative pronouns
       g.   agreeing complementizers

As this overview makes clear, there is strong disagreement regarding the status of the resuming element. It is unclear, first, whether the resuming element is different from the extracted element; except for the first position taken, all answers explicitly deny their similarity. And second, it is unclear what type of element the resuming element is in case it is different from the extracted element. The purpose of the next section is to shed light on these issues, and to come up with a satisfactory characterization of the resuming element.

3.4   A Successful Characterization of the Resuming Element

As shown in the previous section, a satisfactory characterization of the resuming element is so far missing. I show in this section that such a characterization is achievable. In the first part, I argue that the resuming element is not identical to the extracted element and that it is pronominal. I then turn to the question what kind of pronominal element the resuming element is and argue that it is a free relative pronoun, more precisely, a free relative proform. In the second part, I investigate a question that hasn't figured prominently in the literature so far, viz. the agreement relations between the resuming element and the extracted element. I show that they are more complex than expected.

A brief remark on the data appearing in this section. The characterization I arrive at is based on mainly new data, as already said in the introduction to this chapter.

Many of relevant cases are not accepted by many German speakers, even by those who do permit wh-copying. The reason for this is that most judgments I report here come from a rather liberal variety of wh-copying. This variety is not that of the author, but of five speakers of German who I interviewed to obtain the relevant judgments. The use of the word 'variety' and not 'dialect' is deliberate because my informants come from regions that are dialectally unrelated: one informant was from Westphalia, one from the Rhineland, one from Bavaria, one from Saxony, and another one from Franconia. This dialectal heterogenity comes as no surprise because as already observed by Höhle 2000, p. 257, fn. 7, wh-copying is not a dialectal phenomenon, but rather one of idiolectal variation.

3.4.1   The Status of the Resuming Element

3.4.1.1   The Resuming Element as a Wh-Pronoun

The first thing I want to show is that the resuming element is not identical to the extracted element and that the resuming element has a pronominal status. The argument is based on the behavior of *complex wh-phrases*. What I mean by 'complex wh-phrase' is any wh-phrase *containing a lexical noun*. They contrast with what I call *wh-pronouns*, which do not contain a lexical noun. Examples of each type are given in (27).

(27)   a.   complex wh-phrases: welcher Mann (*which man*)
             was für ein Auto (*what (kind of) car*)
             wessen Buch (*whose book*)
        b.   wh-pronouns: wer (*who*)
             was (*what*)
             wann (*when*)

Initially, complex wh-phrases seem to provide a rather straightforward argument for the claim that the resuming element must not be identical to the extracted element because of the ungrammaticality of (25), repeated here for convenience as (28).

(28) * **Wessen Buch** glaubst du   wessen Buch Hans t liest?
         whose book believe you whose book Hans   reads
         Whose book do you think Hans reads?

                                                                                   (McDaniel 1986, p. 183)

Unfortunately, this argument alone is not convincing. Because for many speakers employing wh-copying, there is no way to change this ungrammatical wh-copying structure into a well-formed one, that is, there is no element that could grammatically fill the underlined position in (28). It is of course possible to fill this position with a complementizer (29a) or the finite verb of the embedded clause

(29b), but the resulting structures no longer qualify as wh-copying, but are just regular wh-question extractions.

(29)   a. Wessen Buch glaubst du dass Hans t liest?
          whose book believe you that Hans reads
      b. Wessen Buch glaubst du liest Hans t?
          whose book believe you reads Hans
          Whose book do you think Hans reads?

But then, the ungrammaticality of (28) shows nothing about the resuming element, but only that complex wh-phrases are impossible in wh-copying. This is in fact the consensus position in the literature on wh-copying[4].

However, complex wh-phrases are *not* generally excluded in the liberal variety of wh-copying investigated here. The speakers of this variety do allow complex wh-phrases in wh-copying. And it is the behavior of complex wh-phrases in this variety that sheds new light on the status of the resuming element. Consider first the contrast in (30), shared by all speakers of this variety.

(30)   a.* **Welchen Mann** glaubst du <u>welchen Mann</u> sie t eingeladen hat?
        which man believe you which man she invited has
      b.√ **Welchen Mann** glaubst du <u>wen</u> sie t eingeladen hat?
        which man believe you who she invited has
        Which man do you think she has invited?

As shown, the speakers of the liberal variety disallow full repetition of the complex wh-phrase as well, but do allow a wh-pronoun as resuming element. At first sight, this contrast seems to indicate only that extracted element and resuming element need to be distinct. This account is insufficient though in light of the datum in (31).

(31) * **Wen** glaubst du <u>welchen Mann</u> sie t eingeladen hat?
     who believe you which man she invited has
     Which man do you think she has invited?

Although the extracted element and resuming element are distinct, the sentence is ungrammatical. The contrast between (31) and (30b) shows that complex wh-phrases are generally excluded as resuming elements. But this statement is not sufficient. To see this, consider (32).

(32)   a.* **Welchen Mann** glaubst du <u>den Mann</u> sie t eingeladen hat?
        which man believe you the man she invited has
      b.* **Welchen Mann** glaubst du <u>diesen Mann</u> sie t eingeladen hat?
        which man believe you this man she invited has
      c.* **Welchen Mann** glaubst du <u>einen Mann</u> sie t eingeladen hat?
        which man believe you a man she invited has

---

[4] Cf. Bošković & Nunes 2007, p. 51; Fanselow & Mahajan 2000, pp. 220-1; Pafel 2000, p. 338; Felser 2004, p. 550; Haider 2010, p. 108; Höhle 2000, p. 259; Rett 2006, p. 358.

d.* **Welchen Mann** glaubst du Mann sie t eingeladen hat?
    which   man   believe you man   she invited   has
    Which man do you think she has invited?

The sentences in (32) satisfy all requirements imposed so far: the complex wh-phrase functions as an extracted element, and the resuming element is not a complex wh-phrase (it is complex, but not a complex **wh**-phrase). Nevertheless, the examples are all ungrammatical. What unites the elements functioning as resuming elements in (32) with complex wh-phrases is that they all contain a lexical noun. So, the correct generalization is the following.

(33)   CHARACTERIZATION OF THE RESUMING ELEMENT (FIRST VERSION)
        The resuming element is a wh-pronoun.

This generalization covers all the sentences considered so far. It correctly excludes the sentences in (32) because the resuming elements in them are neither pronominals nor wh-phrases; similarly, the sentences in (31) and (30a) are also out because there too a non-pronominal wh-phrase appears as resuming element. The only sentence satisfying the constraint in (33) is the one in (30b), which has *wen* as a resuming element, a wh-pronoun, and is therefore not blocked by (33).
Before I investigate the status of wh-pronouns as resuming elements more deeply, I add three remarks. First, all types of complex wh-phrases are permitted as extracted elements in the liberal variety, and not only *which*-phrases. That is[5], neither pragmatic nor semantic features play any role regarding the availability of a complex wh-phrase. Both D-linked and non-D-linked complex wh-phrases are permitted (cf. 30b vs. 34a), and both possessive and non-possessive complex wh-phrases (cf. 34b and 34c vs. 30b, 34a, and 34d). I have illustrated the behavior of complex wh-phrases here exclusively with *which*-phrases only for the sake of brevity. Second, all complex wh-phrases obey the constraint in (33). Some grammatical cases featuring other complex wh-phrases are given in (34).

(34)   a. **Was für einen Mann** glaubst du wen sie t eingeladen hat?
           what for a   man   believe you who she invited   has
           What a man do you think she has invited?
        b. **Wessen Freund** glaubst du wen sie t eingeladen hat?
           whose   friend believe you who she invited   has
           Whose friend do you think she has invited?
        c. **Wem seinen Freund** glaubst du wen sie t eingeladen hat?
           who his   friend believe you who she invited   has
           Whose friend do you think she has invited?

---

[5] However, one of my informants didn't accept possessive wh-phrases of the *whose*-type; I have no idea why this is the case. Two other informants didn't accept possessive wh-phrases of the *who his*-type in wh-copying. This however is due to an independent reason because they didn't accept this type of possessive construction in the first place. That is, they judged sentences of the type in (i) marginal at best.
(i) Dem Peter sein Haus ist abgebrannt.
     the   Peter his house is burned.down
     Peter's house burned down.

       d. **Wen von den Männern** glaubst du   <u>wen</u> sie t eingeladen hat?
         who   of   the men   believe you who she invited   has
         Which of the men do you think she has invited?

Third, some of the data presented are not entirely new. Anyadi and Tamrazian 1993 were the first to point out the grammaticality of (35).

(35)   **Welchem Mann** glaubst du   <u>wem</u> sie das Buch t gegeben hat?
        which   man believe you who she the book given   has
        Which man do you think she has given the book to?
                                         (Anyadi & Tamrazian 1993, ex. 6a)

However, these data have been largely ignored in the later analyses of wh-copying or they were considered "not to be a subcase of the c[opy] c[onstruction]." (Fanselow & Cavar 2001, p. 133). But Fanselow & Cavar 2001 provide no argument in support of this conclusion. One argument against their conclusion comes from the fact that according to the judgments of the speakers I consulted, wh-copying with complex wh-phrases is unbounded.

(36)   **Welchen Mann** glaubst du   <u>wen</u> Peter denkt <u>wen</u> sie t geküsst hat?
        which   man believe you who Peter thinks who she kissed has
        Which man do you think Peter believes she has kissed?

So there seems little justification for the claim that wh-copying with complex wh-phrases is different from wh-copying with wh-pronouns.

3.4.1.2 The Resuming Element as a Free Relative Pronoun

I have argued so far that the resuming element is a wh-pronoun. But this characterization is not entirely correct. For four of my five informants also accepted sentences such as those in (37).

(37)   a. **Welchen Mann** glaubst du   <u>den</u> sie t eingeladen hat?
           which   man believe you who she invited   has
           Which man do you think she has invited?
      b. **Was für einen Mann** glaubst du   <u>den</u> sie t eingeladen hat?
           what for a   man believe you who she invited   has
           What a man do you think she has invited?
      c. **Wessen Freund** glaubst du   <u>den</u> sie t eingeladen hat?
           whose   friend believe you who she invited   has
           Whose friend do you think she has invited?

    d. **Wem seinen Freund** glaubst du <u>den</u> sie t eingeladen hat?
       who his   friend believe you who she invited   has
       Whose friend do you think she has invited?
    e. **Wen von den Männern** glaubst du <u>den</u> sie t eingeladen hat?
       who of   the men   believe you who she invited   has
       Which of the men do you think she has invited?

These sentences feature *d-pronouns*[6] as resuming elements. The availability of d-pronouns as resuming elements is not restricted to wh-copying with complex wh-phrases. The same four speakers accepting the sentences in (37) also accepted (38).

(38)   **Wen** glaubst du <u>den</u> sie t gesehen hat?
       who believe you who she seen   has
       Who do you think that she has seen?

That d-pronouns as resuming elements are really equivalent to pronominal wh-phrases as resuming elements is supported by the sentences in (39) and (40).

(39)   a. **Wen** glaubst du <u>den</u> Peter denkt <u>den</u> sie t geküsst hat?
         who believe you who Peter thinks who she kissed   has
         Who do you think Peter believes she has kissed?
    b. **Welchen Mann** glaubst du <u>den</u> Peter denkt <u>den</u> sie t geküsst hat?
         which   man   believe you who Peter thinks who she kissed has
         Which man do you think Peter believes she has kissed?

(40)   a. **Wen** glaubst du <u>wen</u> Peter denkt <u>den</u> sie t geküsst hat?
    b. **Wen** glaubst du <u>den</u> Peter denkt <u>wen</u> sie t geküsst hat?
         who believe you who Peter thinks who she kissed has
         Who do you think Peter believes she has kissed?

The sentences in (39) show that wh-copying with d-pronouns as resuming elements can be unbounded, just like wh-copying with wh-pronouns as resuming elements. Moreover, the sentences in (40) show that wh-pronouns and d-pronouns can be used in one and the same sentence as resuming elements, and in either order.

The problem posed by the availability of d-pronouns as resuming elements is that since they are not wh-phrases, they are not wh-pronouns either, and their availability as resuming elements is consequently not covered by the constraint in (33). The question is of course what to replace this constraint with. At first sight, one could suggest that pronouns in general are permitted as resuming elements, wh-pronouns and d-pronouns being only a special case of them. However, this solution is unlikely to be correct in light of the data in (41).

(41)   a.* **Welchen Mann** glaubst du <u>ihn</u> sie t eingeladen hat?
         which   man   believe you him she invited   has

---

[6] I call these pronouns d-pronouns because they all start with a 'd': d-er (*that one*, nominative), d-en (*that one*, accusative), d-as (*that*), etc.

    b.* **Welchen Mann** glaubst du   welchen/<u>diesen</u> sie t eingeladen hat?
        which   man   believe you which/ this   she invited   has
        Which man do you think she has invited?

These data show that not all types of pronouns are licit as resuming elements. Neither personal pronouns nor determiner-like pronominals such as *welchen* or *diesen* are permitted. The latter count as pronominal because like pronouns, they appear without a lexical noun. The exclusion of determiner-like pronominals as resuming elements carries over to all other types of complex wh-phrases.

(42) a. **Was für einen Mann** glaubst du <u>was für einen/so einen</u> sie t eingeladen hat?
          what for a   man   believe you what for a   so a   she invited   has
          What a man do you think she has invited?
      b. **Wessen Freund** glaubst du <u>wessen/dessen</u> sie t eingeladen hat?
          whose friend believe you whose whose she invited   has
          Whose friend do you think she has invited?
      c. **Wem seinen Freund** glaubst du <u>wem seinen/dem seinen</u> sie t eingeladen hat?
          who his   friend believe you who his   who his   she invited   has
          Whose friend do you think she has invited?
      d. **Wen von den Männern** glaubst du <u>wen von denen/den von denen</u> sie t eingeladen hat?
          who of the men   believe you who of them who of them she invited   has
          Which of the men do you think she has invited?

Given that the only pronominal elements permitted as resuming elements are wh-pronouns and d-pronouns, the question is of course what unites these two pronoun types. More specifically, the question is whether one can give a characterization of the resuming element from which the availability of both wh-pronouns and d-pronouns can be derived. And indeed, such a characterization is possible and given in (43).

(43) CHARACTERIZATION OF THE RESUMING ELEMENT (SECOND VERSION)
      The resuming element is a <u>free relative</u> pronoun.

By free relative pronoun, I refer to those pronouns that are used to introduce free relative clauses[7] (alternatively, headless relative clauses or fused relative clauses). An example from German is given in (44), the translation of which is at the same time an example for a free relative clause in English.

---

[7] The recognition of a specific set of elements for this purpose might evoke some skepticism because all the elements used as free relative pronouns are not restricted to this use. However, what matters is the specific *subset* of pronouns used for this purpose, which in this form *is* restricted to this single use. Moreover, it is not uncommon for languages to also have morphologically distinct forms for free relative pronouns that differ from both relative and interrogative pronouns. One such language is Modern Greek whose system for interrogative, relative, and free relative pronouns is illustrated in (i) on the basis of the masculine, nominative, singular form.

(i) interrogative pronoun: *ποιος*
     relative pronoun: *ο οποίος*
     free relative pronoun: *όποιος*

                                          (Holton et al. 2004, chapter 4, section 4.5 & 4.7)

(44)   Ich esse <u>was du t kochst</u>.
        I eat what you cook.

Three arguments support the correctness of the generalization in (43). First, in
contrast to Standard German, where the set of free relative pronouns is a subset of
the set of wh-pronouns (cf. 3.6), in the variety of wh-copying investigated here, the
set of free relative pronouns also contains d-pronouns (although not all of them, cf.
3.4.1.3). In other words, for all four speakers accepting d-pronouns as resuming
elements, the a- and b-sentences in the examples (45) and (46) are in free variation.

(45)   a. Ich lade ein <u>den</u> alle   t mögen.
        b. Ich lade ein <u>wen</u> alle   t mögen.
            I   invite   who everyone   likes
            I invite who everyone likes.

(46)   a. Ich esse <u>das</u>   du   t gekocht hast.
        b. Ich esse <u>was</u>   du   t gekocht hast.
            I   eat   what you   cooked have
            I eat what you cooked.

Second, all pronominals that are not permitted as resuming elements (cf. ex. 41 and
42) are not permitted as free relative pronouns either.

(47)   a.* Ich lade ein <u>ihn</u> alle   t mögen.
            I   invite   him everyone   likes
            I invite who everyone likes.
        b.* Ich esse <u>es</u> du   t gekocht hast.
            I   eat   it   you   cooked have
            I eat what you cooked.

(48)   * Ich lade ein <u>welchen</u>/<u>diesen</u>/<u>was für einen</u>/<u>wem seinen</u> alle   t mögen.
            I   invite   which/   this/   what for a/   who his   everyone   likes
            I invite who everyone likes.

Third, variation with respect to the availablility of wh- and d-pronouns is restricted
to free relative clauses only for my informants. Relative clauses are introduced by d-
pronouns only (cf. 49a), and additionally d-pronouns can never function as
indefinite or interrogative pronouns (cf. 49b and 49c).

(49)   a. Der Mann *<u>wen</u>/√<u>den</u> sie t liebt ist ein Idiot.
            The man who she loves is an idiot.
        b. Ich sehe √<u>wen</u>/*<u>den</u>.[8]
            I   see   who
            I see someone.

---

[8] This sentence with *den* is of course grammatical with the irrelevant meaning 'I see him'.

    c. [√]<u>Wen</u>/*<u>den</u> hast du t gesehen?⁹
      Who have you seen?

The availability of d-pronouns as free relative pronouns in the variety I investigated is not surprising because their availability is well attested in German dialects, for example in Low German (cf. 50), in Transylvanian German (cf. 51), and in Luxembourgish (cf. 52), a Moselle Franconian dialect of German and official language of Luxembourg.

(50)   <u>De</u> wat kan, de   wat kumt.
       who what can who what comes
       He who is able is successful.

                                              (Weise 1916, p. 70)

(51)   a. <u>Dî</u>   et mâcht, dî brocht et net; <u>dî</u> et kôft, dîn äs et net; <u>dî</u> et brocht, dî wîs   et net.
           who it makes who needs it not who it buys who is it not who it needs who knows it not
           He who makes it doesn't need it; he who buys it doesn't own it; he who needs it doesn't know it
      b. <u>Dian</u> det Sängen net erfrait, dîn sal   dis Geschicht bekîrn.
         who the singing not pleases who shall the history   convert
         He who doesn't like singing shall be convinced by history.

                                        (Weise 1916, pp. 70-1)

(52)   a. <u>Dien</u> bit, dien krit.
         who asks who gets
         He who asks will receive.
      b. <u>Dê</u>   seicht, dê   fent.
         who searches who finds
         He who searches will find.
      c. <u>Den</u> kemt, den äs dô.
         who comes who is there
         He who comes is here.

                                          (Weise 1916, p. 71)

Their use as free relative pronouns is even attested for Standard German[10] (cf. Müller 1999; Vogel 2001). The most well known example may be the German title of the movie *Dances with Wolves* (cf. 53).

---

[9] This sentence with *den* is of course grammatical with a yes/no question interpretation 'Have you seen HIM?'.

[10] According to Donaldson 2008, p. 92, the use of d-pronouns is also possible in Standard Dutch, although their use is "rather literary". He gives the following example.
(i) Die komen wil,   moet nu   betalen.
    who come   wants must now pay
    Whoever wants to come must pay now.
Boef 2012, pp. 183-4, reports that d-pronouns are attested in free relatives in Dutch dialects, cf. (ii).
(ii) Die het weet,   mag het zeggen.
    who it   knows may it   say
    He who knows it may say it.

(53)   <u>Der</u> mit dem Wolf tanzt.
        who with the   wolf dances
        He who dances with the wolf.

However, what is surprising is that my informants use d-pronouns in *free variation*
with wh-pronouns. This is certainly not the case with d-pronouns as free relative
pronouns in Standard German. For there, d-pronouns seem to be restricted to free
relative clauses in subject position (all examples given by Müller are free relative
clauses in subject position, cf. Müller 1999, ex. 5 and 12a) and are preferred with a
definite interpretation. None of these restrictions hold for my informants (cf. for
instance the examples in (45) and (46) containing free relative object clauses). Free
variation regarding the set of free relative pronouns is not completely uncommon
though for German in general: it is also attested in Luxembourgish. Schmitt 1984 in
an investigation of this dialect notes that both wh-pronouns and d-profouns are
permitted as free relative pronouns.

(54)   a. <u>Wien</u> dat   mengt, iirt sech.
            who that means errs SELF
            He, who believes that, is wrong.
        b. <u>Deen</u> dat gleeft,   kritt vu   mir eng Kamell.
            who that believes gets from me a   candy
            He, who that believes, gets a candy from me.

                                                                (Schmitt, 1984, p. 71)

I should add that the availability of d-pronouns in addition to wh-pronouns was
already mentioned by McDaniel 1986. But similar to the data with complex wh-
phrases, the data involving d-pronouns as resuming elements have been ignored in
the literature on German wh-copying. Two examples from her work are provided in
(55).

(55)   a. **Wen** glaubst du   <u>den</u> Hans t sieht?
            who believe you who Hans   sees
            Who do you think Hans sees?
        b. **Mit wem** glaubst du   <u>mit dem</u>   Hans t spricht?
            with whom believe you with whom Hans   talks
            Who do you think Hans talks to?

                                                        (McDaniel 1986, pp. 183-4)

(55b) features both the extracted element and the resuming element as a PP, the
properties of which is the subject of the next subsection

3.4.1.3   The Resuming Element as a Free Relative Proform

All examples presented so far involved noun phrases. But as mentioned in the previous chapter, wh-copying is categorially unrestricted, that is, PPs and adverbs are permitted, too. Two examples from the previous chapter are provided in (56).

(56) a. **Mit wem** glaubst du <u>mit wem</u> Hans t spricht?
          with whom believe you with whom Hans   talks
          Who do you think Hans is talking to?
      b. **Wann** glaubst du <u>wann</u> wir uns t treffen sollten?
          when believe you when we us   meet   should
          When do you think we should meet?

The availability of PPs as extracted elements carries over to complex wh-phrases. The examples in (54) are generally[11] grammatical in the liberal variety.

(57) a. **Mit welchem Mann** glaubst du <u>mit wem</u> er sich t getroffen hat?
          with which   man   believe you with whom he SELF met   has
          Which man do you think he met with?
      b. **Auf welches Auto** glaubst du <u>auf was</u> er schon seit Wochen t wartet?
          on which car believe you on what he already for weeks   waits
          Which car do you think he's already been waiting for for weeks?

They are equally grammatical with resuming elements having d-pronouns as a complement to the preposition[12].

(58) a. **Mit welchem Mann** glaubst du <u>mit dem</u> er sich t getroffen hat?
          with which   man   believe you with whom he SELF met   has
          Which man do you think he met with?
      b. **Auf welches Auto** glaubst du <u>auf das</u> er schon seit Wochen t wartet?
          on which car believe you on that he already for weeks   waits
          Which car do you think he's already waiting for for weeks?
      c. **Mit wem** glaubst du <u>mit dem</u> er sich t getroffen hat?
          with whom believe you with whom he SELF met   has
          Who do you think he has met with?
      d. **Auf was** glaubst du <u>auf das</u> er schon seit Wochen t wartet?
          on what believe you on that he already for weeks   waits
          What do you think he has been waiting for for weeks?

The grammaticality of these examples makes clear that the characterization of the resuming element as a free relative pronoun is not fully correct. None of the

---

[11] I say 'generally' because PPs are subject to many idiosyncratic constraints which I however ignore in this thesis because these constraints do not clash with the characterization of the resuming element I arrive at in this chapter.

[12] With regard to complex wh-phrases, the grammaticality is again unaffected by the type of complex wh-phrase appearing in sentences with PPs.

resuming elements in the examples (56)-(58) is literally a pronoun, that is, a nominal element. Therefore, the characterization of the resuming element has to be revised again; its final version is in (59).

(59)   CHARACTERIZATION OF THE RESUMING ELEMENT (FINAL VERSION)
        The resuming element is a free relative <u>proform</u>.

The use of the term *proform* is meant to convey that the resuming element is at the same time not restricted to nominal elements (since it can also show up as a PP or as an adverb) and cannot host lexical nouns.
The data from PP-proforms and adverbial proforms as resuming elements further strengthen the free relative character of the resuming element. Consider first the following sentences.

(60)   a. Ich treffe mich <u>mit wem</u>   sie t getanzt hat.
            I   meet   me   with whom she danced has
        b. Ich treffe mich <u>mit dem</u>   sie t getanzt hat.
            I   meet   me   with whom she danced has
            I met up with whom she danced.
        c. Er freut   sich <u>auf was</u> er schon   seit Wochen wartet.
            he looks.forward SELF on what he already for weeks   waits
        d. Er freut   sich <u>auf das</u> er schon   seit Wochen wartet.
            he looks.forward SELF on that he already for weeks   waits
            He is looking forward to what he has been waiting for for weeks.

These examples show that all the PP-proforms permitted as resuming elements are also permitted as free relative proforms. Consider now the following contrast.

(61)   a. **Auf welches Auto** glaubst du   <u>worauf</u>   er schon   seit Wochen t wartet?
            on which   car   believe you what.on he already for weeks   waits
            Which car do you think he's already been waiting for for weeks?
        b. **Auf was** glaubst du   <u>worauf</u>   er schon   seit Wochen t wartet?
            on   what believe you what.on he already for weeks   waits
            What do you think he's already been waiting for for weeks?

(62)   a.* **Auf welches Auto** glaubst du   <u>darauf</u>   er schon   seit Wochen t wartet?
            on which   car   believe you what.on he already for weeks   waits
            Which car do you think he's already been waiting for for weeks?
        b.* **Auf was** glaubst du   <u>darauf</u>   er schon   seit Wochen t wartet?
            on   what believe you what.on he already for weeks   waits
            What do you think he's already been waiting for for weeks?

These examples feature *fused* versions of PPs, as indicated for *worauf* in (63).

(63)   auf was → worauf

Since PPs containing an animate marked pronoun as a complement don't permit fusion in the first place in German (cf. 64), no examples featuring complex wh-phrases with animate lexical nouns as extracted elements are given in (61) and (62).

(64) * auf wen → worauf

The question is of course what excludes the sentences in (62); the answer to this is again related to the fact that only free relative proforms are permitted. For although *worauf* is permitted as a free relative proform, *darauf* is not.

(65) a. Er freut   sich <u>worauf</u> er schon seit Wochen wartet.
          he looks.forward SELF what.on he already for   weeks   waits
          He is looking forward to what he has been waiting for for weeks.
      b.* Er freut   sich <u>darauf</u>   er schon seit Wochen wartet.
          he looks.forward SELF what.on he already for   weeks   waits
          He is looking forward to what he has been waiting for for weeks.

Incidentally, this shows clearly that a morphological characterization of the resuming element such as the one in (66) is inferior to the one provided in (59).

(66)   *The resuming element is either a wh- or a d-proform.*

For the examples in (62) all contain d-proforms as resuming elements but the examples are nevertheless ungrammatical[13]. The correctness of the functional characterization of the resuming element in terms of *free relative proform* in contrast to the morphological one in (66) is further supported by the behavior of adverbials. Consider the following contrasts.

---

[13] This leaves of course unexplained why elements such as *darauf* are not permitted as free relative proforms. This is most likely due to the fact that such elements are fused versions of a preposition and a personal pronoun, and not of a preposition and a d-pronoun, as indicated in (i).
(i) a.   darauf ← auf es (*on it*)
      b. * darauf ← auf das (*on that*)
One observation supporting this analysis derives from observations made in Bosch et al. 2003, Geyer 2007, and Hinterwimmer (to appear), who observe that d-pronouns cannot have an antecedent that is the aboutness topic.
(ii) Das Mädchen$_i$ behauptet, dass es/*das außergewöhnlich hübsch ist.
      the girl   claims   that it/ that extraordinarily   pretty is
      The girl claims to be extraordinarily pretty.
Since *Mädchen* is the aboutness topic, a d-pronoun cannot be used to indicate coreference, but only a personal pronoun. Interestingly, fused PPs behave like personal pronouns and not like d-pronouns, cf (iii).
(iii) Bier$_i$ sollte Grundnahrungsmittel werden damit keiner   mehr darauf/*auf das verzichten muss.
       beer should staple food   become in.order nobody more it.on/ on that abstain   must
       Beer should become staple food so that nobody needs to abstain from it.
In this example, *Bier* is the aboutness topic, and a PP containing a d-pronoun cannot be used to mark coreference, but only the form *darauf*. Therefore, the observation that the fused versions of PP pattern like personal pronouns strongly indicates that these fused types of PPs contain a personal pronoun and not a d-pronoun.

(67)   a. **Wann** glaubst du <u>wann</u> sie   sich t getroffen haben?
          when believe you when they SELF   met   have
          When do you think that they met?
       b. **Wo**   glaubst du <u>wo</u>   sie   sich t getroffen haben?
          where believe you where they SELF   met   have
          Where do you think that they met?

(68)   a.* **Wann** glaubst du <u>dann</u> sie   sich t getroffen haben?
          when believe you then they SELF   met   have
          When do you think that they met?
       b.* **Wo**   glaubst du <u>da</u>   sie   sich t getroffen haben?
          where believe you there they SELF   met   have
          Where do you think that they met?

As can be observed, adverbial d-proforms are not permitted in wh-copying. This is
mimicked by their unavailability as free relative proforms, in contrast to adverbial
wh-proforms.

(69)   a. Ich komme <u>wann</u>/*<u>dann</u> ich t will[14].
          I   come   when/ then I   want
          I come whenever I want.
       b. Ich wohne <u>wo</u>/ *<u>da</u>   ich t will.
          I   live   where/there I   want.
          I live wherever I want.

In sum, I have argued on the basis of data from complex wh-phrases and d-pronouns
in wh-copying that the resuming element is a free relative proform.
Before proceeding, I want to stress two important points here. First, when I say that
the resuming element is a free relative proform, I am not claiming that the embedded

---

[14] These and similar examples to follow involve free relative clauses with what one might call VP-
deletion, as indicated by the interpretation of such examples.
(i)   Ich komme wann ich will.
      = Ich komme wann ich [kommen] will.
        Ich mache das wie ich will.
      = Ich mache das wie ich [das machen] will.
That such examples are really instances of free relative clauses is suggested by the fact that no complex
wh-phrases are permitted, which fact also holds for clear instances of free relative clauses.
(ii) a. * Ich komme an welchem Tag ich t will
              I   come   on which   day I   want
              I come which day I want to come.
     b. * Ich esse welches Essen du t kochst.
              I eat which food you cook
Similar to free relative clauses, adding *auch immer* (engl. ever) to the complex wh-phases results in full
grammaticality.
(iii) a. Ich komme an welchem Tag auch immer ich t will
              I   come   on which   day also ever   I   want
              I come which day I want to come.
     b. Ich esse welches Essen auch immer du t kochst.
              I   eat   which   food also ever   you cook
              I eat whichever food you cook

clause is a free relative clause itself; cf. section 3.6 below for arguments against this view. All I claim is that the set of resuming elements is coextensive to the set of free relative proforms. Second, I do not claim that the resuming element in wh-copying constructions is universally a free relative proform. All I say is that this is the correct generalization for wh-copying *in German*. Other languages with wh-copying not only seem to differ in this respect (cf. Boef 2012, p. 112, for Dutch) but also do differ in this respect, for example Afrikaans. I return to this issue of variation in chapter 8.

3.4.2   The Agreement Properties of the Resuming Element

Up to now, I argued that the resuming element is a free relative proform. Although this already puts a heavy restriction on what is a licit resuming element, it is not yet sufficient enough. What is still missing is an account of the morphosyntactic properties the resuming element has to share with the extracted element. Since the requirements on what needs to be identical vary from category to category, I deal with each category type separately.

3.4.2.1 The Agreement Properties of Nominal Resuming Elements

As I just stated, the characterization of the resuming element as a free relative proform is not sufficient yet. To see this, consider the following sentences.

(70)   a.* **Welchen Mann** glaubst du   was sie t gesehen hat?
              which   man   believe you what she seen   has
              Which man do you think she has seen?
        b.* **Wen** glaubst du   was sie t gesehen hat?
              who believe you what she seen   has
              Who do you think she has seen?

Both examples have the element *was* as a resuming element, a wh-pronoun permitted as free relative pronoun (cf. 44 and 46b), yet the sentences are ungrammatical. Unfortunately, nothing so far excludes such ungrammatical sentences. But the reason for their ungrammaticality is easy to identify: the resuming element in these examples doesn't agree with the extracted element in φ-features, that is, in number, gender, and person features. The agreement restriction for pronouns as resuming elements can therefore be stated as in (71).

(71)   AGREEMENT RESTRICTION FOR NOMINAL RESUMING ELEMENTS (FIRST VERSION)
        If the resuming element is a free relative pronoun, then it agrees with the extracted element in φ-features.

Agreement for person features is satisfied vacuously by all examples because wh-phrases in general (complex wh-phrases and wh-pronouns) and d-pronouns are restricted to third person. The agreement effect is hardly visible when the extracted element itself is a wh-pronoun because of their defective paradigm, compared to the non-defective paradigm of d-pronouns.

	SG			PL
	MASC	FEM	NEUT	
NOM	*wer*	-	*was*	-
ACC	*wen*	-	*was*	-
DAT	*wem*	-	*was*	-

Table 1: paradigm for wh-pronouns

	SG			PL
	MASC	FEM	NEUT	
NOM	*der*	*die*	*das*	*die*
ACC	*den*	*die*	*das*	*die*
DAT	*dem*	*der*	*dem*	*denen*

Table 2: paradigm for d-pronouns

The defectiveness is illustrated in (72) and (73).

(72) a. Wer kommt?
          who come.3.SG
          Who comes?
      b.* Wer kommen?
          who come.3.PL
          Who come?

(73) a. Wer$_i$ denkt er$_i$ sei hübsch?
          who thinks he is pretty
          Who thinks he is pretty?
      b.* Wer$_i$ denkt sie$_i$ sei hübsch?
          who thinks she is pretty
          Who thinks she is pretty?

Wh-pronouns cannot trigger plural verb agreement, indicating that they are inherently singular; they cannot bind feminine marked personal pronouns, indicating that they are inherently masculine. This conclusion is reinforced by the behavior of wh-pronouns in possessive constructions with dative marked elements expressing the possessor, and in *wen von den* type complex wh-phrases. Consider the first case.

(74) a. Dem   sein Buch haben wir t gelesen.
          the.MASC.DAT his book have   we   read
          We read his book.
      b. Der   ihr Buch haben wir t gelesen.
          the.FEM.DAT her book   have   we   read
          We read her book.
      c. Denen   ihr Buch haben wir t gelesen.
          they.DAT their book have   we   read
          We read their book.
      d. Wem   sein/*ihr/*ihr Buch habt ihr t gelesen?
          who.MASC.DAT his   her their book have you   read
          Whose book did you read?

In these examples, an alternative construction from German to express possession is illustrated, viz. one where instead of having only a possessive pronoun, a d-pronoun in the dative case in combination with a possessive pronoun is used. As can be seen, whereas d-pronouns are able to control these features on all possessive pronouns, the dative marked wh-pronoun *wem* can only control for singular and masculine gender features, indicating again its defectiveness. A similar effect can be observed in *wen von den* type complex wh-phrases, cf. (75).

(75) a. Wer von den Männern t tanzt?
         who of the men dances
         Which of the men dances?
      b.* Wer von den Frauen t tanzt?
         who of the women dances
         Which of the women dances?

As these examples show, the wh-pronoun *wer* in *wer von den NP* type phrases has to agree with the restriction provided by the lexical noun in gender features. Since the wh-pronoun *wer* is marked for masculine gender only, the ungrammaticality of (75b) follows, since there the lexical noun is marked for feminine gender[15].

Nevertheless, these two factors can still be used to illustrate the effects of the agreement restriction even for wh-pronominals. Consider the following:

(76) a.* **Wer** glaubst du <u>die</u>   t gekommen sind?
         who.SG believe you who.PL come   are
         Who do you think has come?
      b.* **Wen**   glaubst du <u>die</u>   er t liebt?
         who.MASC believe you who.FEM he loves
         Who do you think he loves?

The reason for their ungrammaticality is of course the violation of the agreement restriction put on the resuming element. Since the extracted element *wer* is inherently singular marked, the resuming element cannot be a plural marked d-pronoun. Similarly, since the extracted element *wen* is inherently masculine marked, the resuming element cannot be a feminine marked d-pronoun.

The effect of the agreement restriction shows up even more strongly with complex wh-phrases as extracted elements since nouns in German are lexically marked for number and gender. Examples of this are provided in (77).

(77) a. Mann (*man*):   masculine & singular
      a'. Männer (*men*): masculine & plural
      b. Frau (*woman*):   feminine & singular

---

[15] The following two examples are ungrammatical as well.
(i) *Wer/was   von den Kindern t tanzt?
    who what of the children   dances
    Which of the children dances?
This shows again that *wer* is incompatible with neuter marked lexical nouns, but also that the neuter marked wh-pronoun *was* is incompatible with [+human] marked lexical nouns.

    b'. Frauen (*women*): feminine & plural
    c. Kind (*child*):   neuter & singular
    c'. Kinder (*children*): neuter & plural

If such a noun is the noun of a complex wh-phrase that appears as an extracted element, then the resuming element *must* agree with it in these features. The examples in (78) illustrate this for singular complex wh-phrases.

(78) a. **Welchen Mann**   glaubst du <u>den</u>   er t eingeladen hat?
          which   man.MASC.SG believe you who.MASC.SG he invited   has
          Which man do you think he has invited?
      b. **Welche Frau**   glaubst du <u>die</u>   er t eingeladen hat?
          which   woman.FEM.SG believe you who.FEM.SG he invited   has
          Which woman do you think he has invited?
      c. **Welches Kind**   glaubst du <u>das</u>   sie t abgeholt   hat?
          which   child.NEUT.SG believe you what.NEUT.SG she picked.up has
          Which child do you think she has picked up?

The examples in (79) show the same effect for plural marked complex wh-phrases.

(79) **Welche Männer/Frauen/Kinder** glaubst du <u>die</u>   er t eingeladen hat?
      which   men/   women/ children believe you who.PL he invited   has
      Which men/women/children do you think he has invited?

Since gender differences only show up in the singular paradigm of d-pronouns (cf. table 2), the three different sentences have been merged into one example sentence for the sake of brevity.
Needless to say the non-agreeing forms of the resuming element were uniformly rejected, as illustrated for a complex wh-phrase containing a lexical noun with masculine singular marking.

(80) * **Welchen Mann**   glaubst du <u>was/das/</u>   <u>die</u>   er t eingeladen hat?
         which   man.MASC.SG believe you what.NEUT.SG/who.FEM.SG he invited   has
         Which man do you think he has invited?

As documented in the previous section, one of my five informants didn't accept d-pronouns as resuming elements (he also rejected them as free relative pronouns). And as was also shown, wh-proforms are morphologically defective in that they are not marked for feminine or plural. The interesting question which now arises is what the speaker does when the extracted element is a complex wh-phrase containing either a feminine or plural marked noun, that is, what elements can fill the slots in the following examples.

(81) a. **Welche Frau**   glaubst du ___ er t eingeladen hat?
          which   woman.MASC.SG believe you   he invited   has
          Which woman do you think he has invited?

    b. **Welche Männer/Frauen/Kinder** glaubst du ___ er t eingeladen hat?
       which men/ women/ children believe you   he invited   has
       Which man/women/children do you think he has invited?

The answer is: no legitimate resuming element can fill these slots. Or more specifically: such sentences are *ineffable* for this speaker. Neither an agreeing personal pronoun or wh-determiner nor non-agreeing wh-pronouns become available.

(82) a.* **Welche Frau**   glaubst du <u>sie</u> er t eingeladen hat?
        which   woman.FEM.SG believe you she he invited   has
      b.* **Welche Frau**   glaubst du <u>welche</u>   er t eingeladen hat?
        which   woman.FEM.SG believe you which.FEM.SG he invited   has
      c.* **Welche Frau**   glaubst du <u>wen</u>   er t eingeladen hat?
        which   woman.FEM.SG believe you who.MASC.SG he invited   has
      d.* **Welche Frau**   glaubst du <u>was</u>   er t eingeladen hat?
        which   woman.FEM.SG believe you what.NEUT.SG he invited   has
        Which woman do you think he has invited?

Nor does the speaker starts permitting d-pronouns as resuming elements.

(83) * **Welche Frau**   glaubst du <u>die</u>   er t eingeladen hat?
     which   woman.MASC.SG believe you who.FEM.SG he invited   has
     Which woman do you think he has invited?

The same effect holds for complex wh-phrases containing a plural marked noun, which for reasons of brevity is not illustrated.

The reason for this ineffability effect is that for this speaker no element could satisfy both the agreement restriction on the resuming element and the requirement that the element be a free relative proform. For this speaker only permits wh-pronouns as resuming elements, and wh-pronouns cannot be marked for feminine gender or plural number.

Before revising the agreement restriction for nominal resuming elements, I briefly discuss the claim that it is the noun inside a complex wh-phrase that controls agreement for φ-features on the resuming element. Consider the paradigm for the element *welch-*, which appears as determiner in D-linked complex wh-phrases.

	SG			PL
	MASC	MASC	MASC	
NOM	*welcher*	*welche*	*welches*	*welche*
ACC	*welchen*	*welche*	*welches*	*welche*
DAT	*welchem*	*welcher*	*welches*	*welchen*

Table 3: paradigm for *welch-*

This element marks precisely those features that are also marked on d-pronouns, viz. gender and number. Moreover, like d-pronouns, gender is only marked in the singular. One could therefore suggest alternatively that the *determiner* and not the

noun controls agreement for φ-features on the resuming element. But this alternative fails because the same agreement effects described for which-type complex wh-phrases also hold for those complex wh-phrases whose determiner is *invariant*. One such determiner is the possessive determiner *wessen* (whose). Its shape is unaffected by the gender and number features of the noun it is attached to, that is, it always appears as *wessen*. This shape invariance is easily explained if one assumes that *wessen* is always unmarked for φ-features[16]. However, despite this invariance, the agreement effects presented earlier for which-type complex wh-phrases carry over one-to-one to complex wh-phrases containing the determiner *wessen*.

(84) a. **Wessen Mann**   glaubst du <u>den</u>   er t eingeladen hat?
          whose   man.MASC.SG believe you who.MASC.SG he invited   has
          Whose husband do you think he has invited?
      b. **Wessen Frau**   glaubst du <u>die</u>   er t eingeladen hat?
          whose   woman.FEM.SG believe you who.FEM.SG he invited   has
          Whose woman do you think he has invited?
      c. **Wessen Kind**   glaubst du <u>das</u>   sie t abgeholt   hat?
          whose   child.NEUT.SG believe you what.NEUT.SG she picked.up has
          Which child do you think she has picked up?
      d. **Wessen Männer/Frauen/Kinder** glaubst du <u>die</u>   er t eingeladen hat?
          which   men/   women/ children believe you who.PL he invited   has
          Whose husbands/wives/children do you think he has invited?

No resuming elements other than the ones provided in (84) are grammatical, most importantly, not even *wessen*:

(85) * **Wessen Mann**   glaubst du <u>wessen</u> er t eingeladen hat?
        whose   man.MASC.SG believe you whose he invited   has
        Whose husband do you think he has invited?

If agreement for φ-features were controlled by the determiner in a complex wh-phrase, the data in (84) and (85) would be problematic; they follow, however, without further saying from the analysis that it is the noun in complex wh-phrases

---

[16] That *wessen* is really unspecified for φ-features and not only restricted to some set of φ-features is suggested by the observation that *wessen* can bind feminine and plural marked pronouns, similar to regular possessives.

(i)   a. Marias$_i$ Mann hat ihr$_i$ gesagt dass sie$_i$ schön   ist.
         Maria's man   has her said   that she beautiful is
         Maria's husband told her that she is beautiful.
      b. Wessen$_i$ Mann hat ihr$_i$ gesagt dass sie$_i$ schön   ist.
         whose   man has her said   that she beautiful is
         Whose husband told her that she is beautiful?

(ii) a. Ihr$_i$ Führer hat ihnen$_i$ gesagt zu gehen.
         their leader has them   said   to leave
         Their leader told them to leave.
      b. Wessen$_i$ Führer hat ihnen$_i$ gesagt zu gehen.
         whose   leader has them   said   to leave
         Whose leader has told them to leave?

that controls agreement for φ-features on the resuming element and not the determiner.

The present version of the agreement restriction is however not fully correct so far. Consider the sentences in (86).

(86) a.* **Wen**   glaubst du   <u>wem</u>   sie t liebt?
          who.ACC believe you who.DAT she loves
      b.* **Wem**   meinst du   <u>wen</u>   sie t liebt?
          who.DAT mean you   who.ACC she loves
      c. **Wen**   glaubst du   <u>wen</u>   sie t liebt?
          who.ACC believe you who.ACC she loves
          Who do you think she loves?

In each example, the resuming element satisfies all relevant constraints imposed on it by the characterization arrived at so far. It is a pronominal of the right kind (in this case, a wh-pronoun) and it agrees in number and gender with the extracted element. However, only example (86c) is well-formed. The same contrasts show up with complex wh-phrases as extracted elements (cf. 87) and with d-pronouns as resuming elements (cf. 88).

(87) a.* **Welchen Mann** glaubst du <u>wem</u>   sie t liebt?
          which.ACC man   believe you who.DAT she loves
      b.* **Welchem Mann** meinst du   <u>wen</u>   sie t liebt?
          which.DAT man   mean you   who.ACC she loves
      c. **Welchen Mann** glaubst du <u>wen</u>   sie t liebt?
          which.ACC man   believe you who.ACC she loves
          Which man do you think she loves?

(88) a.* **Wen**   glaubst du   <u>dem</u>   sie t liebt?
          who.ACC believe you who.DAT she loves
      b.* **Wem**   meinst du   <u>den</u>   sie t liebt?
          who.DAT mean you   who.ACC she loves
      c. **Wen**   glaubst du   <u>den</u>   sie t liebt?
          who.ACC believe you who.ACC she loves
          Who do you think she loves?

What distinguishes the c-examples from the other examples is that only in them do the extracted element and the resuming element bear the same *case*. So, the characterization of the resuming element needs to be adjusted to (89).

(89)   AGREEMENT RESTRICTION FOR NOMINAL RESUMING ELEMENTS (SECOND VERSION)
        If the resuming element is a free relative pronoun, then it agrees with the extracted element in φ-features <u>and case</u>.

This additional requirement on identity of case looks initially redundant in light of the connectivity effects mentioned in chapter 2 which hold for wh-copying. There, it was observed that the extracted element has to satisfy the selectional restrictions

imposed on the gap position. The examples in (86)-(88) can therefore also be interpreted by saying that the connectivity requirement has to be satisfied by the resuming element as well. Then, the ungrammatical examples would be out. For example, the a-examples are predicted to be ungrammatical because the gap position requires accusative case, whereas the resuming element is marked by dative case. Nevertheless, specifying agreement for case is the correct option. To see this, consider the examples in (90).

(90)   a. Er lehrt   ihm/   ihn   die lateinische Sprache.
           he teaches him.DAT/him.ACC the Latin   language
           He teaches him the Latin language.
       b.* **Wen**   glaubst du <u>wem</u>   er t die lateinische Sprache lehren wird?
           who.ACC believe you who.DAT he the Latin   language teach will
       c.* **Wem**   glaubst du <u>wen</u>   er t die lateinische Sprache lehren wird?
           who.DAT believe you who.ACC he the Latin   language teach will
       d. **Wem**   glaubst du <u>wem</u>   er t die lateinische Sprache lehren wird?
           who.DAT believe you who.DAT he the Latin   language teach will
       e. **Wen**   glaubst du <u>wen</u>   er t die lateinische Sprache lehren wird?
           who.ACC believe you who.ACC he the Latin   language teach will
           Who do you believe he teaches the Latin language?

As example (90a) shows, the verb *lehren* (Engl. to teach) is compatible with both accusative and dative case. Despite this variation present in the gap position, this variation doesn't extend to the extracted element and the resuming element (cf. 90b and 90c). They have to agree in case (cf. 90d and 90e), although each element itself *is* in fact compatible with the selectional requirement imposed on the gap position. This shows quite forcefully that what is at stake in (86)-(88) is an agreement effect, and not a connectivity effect.
Lastly, consider the following contrast.

(91)   a. **Wen**   glaubst du <u>wen</u>   sie t liebt?
           who.ACC believe you who.ACC she loves
           Who do you think she loves?
       b.* **An wen**   glaubst du <u>wen</u>   sie t liebt?
           on who.ACC believe you who.ACC she loves
           Who do you think she loves?

This contrast reveals that the extracted element and the resuming element have to agree in category; more specifically, if the resuming element is nominal, the extracted element has to be a nominal as well. This again appears at first sight to be subsumable under the connectivity requirement, but again agreement is the right analysis, as revealed by the sentences in (92).

(92)   a. Sie schreibt ihm/   an ihn   einen Brief.
           she writes   him.DAT/on him.ACC a   letter
           She writes a letter to him.

b.* **An wen**   denkst du <u>wem</u>   sie t einen Brief schreibt?
    on who.ACC think you who.DAT she a   letter writes

c. **Wem**   denkst du <u>wem</u>   sie t einen Brief schreibt?
    who.DAT think you who.DAT she a   letter writes
    Who do you think she writes a letter to?

The predicate *schreiben* (Engl. to write) either permits a PP or a dative-marked NP to express the second argument[17]. That is, the gap position is compatible with both options. However, this optionality ceases in wh-copying contexts: although distinct, both the resuming element and the extracted element are compatible with the requirements imposed on the gap position. Nevertheless, (92b) is ungrammatical, indicating that the agreement restriction needs to be revised a final time.

(93)   AGREEMENT RESTRICTION FOR NOMINAL RESUMING ELEMENTS (FINAL VERSION)
    If the resuming element is a free relative pronoun, then the extracted element is a nominal with which the resuming element agrees in φ-features and case.

3.4.2.2 The Agreement Properties of PPs as Resuming Elements

I now turn to the agreement properties of resuming elements that are PPs. Consider first the contrast in (94), which is similar to the one in (92).

(94)   a. Sie schreibt ihm/   an ihn   einen Brief.
        she writes him.DAT/on him.ACC a   letter
        She writes a letter to him.

    b.* **Wem**   denkst du <u>an wen</u>   sie t einen Brief schreibt?
        who.DAT think you on who.ACC she a   letter writes

    c. **An wen**   denkst du <u>an wen</u>   sie t einen Brief schreibt?
        on who.ACC think you on who.ACC she a   letter writes
        Who do you think she writes a letter to?

What the judgments indicate is that if the resuming element is a PP, then the extracted element has to a PP as well. The preliminary version of the agreement restriction for PPs is formulated in (95).

(95)   AGREEMENT RESTRICTION FOR PPS AS RESUMING ELEMENTS (FIRST VERSION)
    If the resuming element is a free relative pro-PP, then the extracted element is a PP.

This statement is however not yet sufficient. For instance, the ungrammatical examples in (96) are not ruled out by this statement.

---

[17] This alternation actually results in a different linearization of the second object: when an NP, it precedes the first argument, when a PP it follows it. I ignore this linearization difference here because it only adds unnecessary complications that doesn't affect the argument at all.

(96) a.* **Auf wen**   denkst du <u>an wen</u>   sie t einen Brief schreibt?
        upon who.ACC think you on who.ACC she a   letter writes
    b.* **An wen**   denkst du <u>auf wen</u>   sie t einen Brief schreibt?
        on who.ACC think you upon who.ACC she a   letter writes
        Who do you think she writes a letter to?

The agreement restriction therefore needs to be adjusted.

(97)   AGREEMENT RESTRICTION FOR PPS AS RESUMING ELEMENTS (SECOND VERSION)
        If the resuming element is a free relative pro-PP, then the extracted element is a PP
        such that the preposition is identical to the one in the pro-PP.

And also here, connectivity is not a viable alternative, despite the fact that the predicate *schreiben* does not permit the PP *auf wen* to express the second argument.

(98) * Ich schreibe einen Brief auf   ihn.
       I   write   a   letter upon him.ACC
       I write a letter to him.

The superiority of the agreement approach embodied in (95) over the connectivity approach shows up with predicates that permit different PPs to express the same argument. Two such predicates are *bewerben* (Engl. to apply) and *sprechen* (Engl. to talk), both of which allow its second object to surface as different PPs.

(99) a. Ich bewerbe mich um   diese Stelle/ für diese Stelle.
        I   apply   me   around this position for this   position
        I apply for this position.
    b. Ich spreche von Maria/über Maria.
        I   talk   of   Maria about Maria
        I talk about Maria.

If only connectivity were at work, one would predict that both options could be instantiated in wh-copying, one by the extracted element and one by the resuming element. But this is impossible.

(100) a.* **Um**   **was** glaubst du <u>für was</u> er sich t bewirbt?
         around what believe you for what he SELF   applies
    b.* **Für was** glaubst du <u>um   was</u> er sich t bewirbt?
         for   what believe du around what he SELF   applies
        What do you think he applies for?
    c.* **Von wem** glaubst du <u>über wen</u>   er t spricht?
         of   whom believe you about whom he   talks
    d.* **Über wen**   glaubst du <u>von wem</u> er t spricht?
         about whom believe you of   whom he   talks
        Who do you think he talks about?

The only grammatical examples are the ones involving PPs with identical prepositions.

(101) a. **Um was** glaubst du <u>um was</u> er sich t bewirbt?
 around what believe you around what he SELF applies

 b. **Für was** glaubst du <u>für was</u> er sich t bewirbt?
 for what believe you for what he SELF applies
 What do you think he applies for?

 c. **Von wem** glaubst du <u>von wem</u> er t spricht?
 of whom believe you of whom he talks

 d. **Über wen** glaubst du <u>über wen</u> er t spricht?
 about whom believe you about whom he talks
 Who do you think he talks about?

Since it is only the restriction demanding identical PPs that can account for the difference between the examples (100) and (101), only it can consequently be the right option. The identity restriction does not distinguish between PPs of the fused and the non-fused type, as desired.

(102) a. **Worauf** glaubst du <u>auf was</u> er schon seit Wochen t wartet?
 what.on believe you on what he already for weeks waits

 b. **Auf was** glaubst du <u>worauf</u> er schon seit Wochen t wartet?
 on what believe you what.on he already for weeks waits
 What do you think he has been waiting for for weeks?

The last aspect that needs to be included into the final version of the agreement restriction for PPs is that the nominal complements in the PPs must agree for φ-features and case, as the contrasts in (103) illustrate.

(103) a.* **Von wem** glaubst du <u>von was</u> er t spricht?
 of whom.MASC.SG believe you of what.N.SG he talks

 b.* **Von was** glaubst du <u>von wem</u> er t spricht?
 of what.NEUT.SG believe you of whom.MASC.SG he talks
 What/who do you think he talks about?

 c.* **An wen** denkst du <u>an wem</u> sie t einen Brief schreibt?
 on who.ACC think you on who.DAT she a letter writes

 d.* **An wem** denkst du <u>an wen</u> sie t einen Brief schreibt?
 on who.DAT think you on who.ACC she a letter writes
 Who do you think she writes a letter to?

The final version of the agreement restriction for PPs is given in (104)[18].

---

[18] Instead of having two agreement statements for NPs and PPs, one could unify both in the following way. First, one could treat the type of preposition as a feature specified on the top node defining the whole PPs (cf. Gazdar et al. 1985). Second, one could further specify case and φ-features of the preposition's complement NP on the top node, too. Then, the following statement is possible.
(i) *The resuming element agrees with the extracted element for the features specified on the node defining the extracted element.*

(104) AGREEMENT RESTRICTION FOR PPS AS RESUMING ELEMENTS (FINAL VERSION)
       *If the resuming element is a free relative pro-PP, then (i) the extracted element   is   a
       PP such that the preposition is identical to the one in the pro-PP, and (ii) the nominal
       complements of both PPs agree in φ-features and case.*

3.4.2.3 The Agreement Properties of Adverbs as Resuming Elements

I finally turn to adverbs as resuming elements, that is, elements such as *wann* (Engl.
when) or *wo* (Engl. where). The relevant contrasts that need to be captured by the
restriction on adverbs are provided in (105).

(105) a. **Wann** glaubst du <u>wann</u> sie   sich t getroffen haben?
         when   believe you when they SELF   met   have
      b.* **Wann** glaubst du <u>wo</u>   sie   sich t getroffen haben?
         when   believe you where they SELF   met   have
         When do you think that they met?
      c. **Wo**   glaubst du <u>wo</u>   sie   sich t getroffen haben?
         where believe you where they SELF   met   have
      d.* **Wo**   glaubst du <u>wann</u> sie   sich t getroffen haben?
         where believe you when they SELF   met   have
         Where do you think that they met?

What distinguishes the grammatical from the ungrammatical examples is of course
the adverbial relation involved: *wann* is an adverb indicating a temporal adverbial
relation, whereas *wo* is an adverb indicating a locational adverbial relation. So what
has to stay constant are adverbial relations, as the contrasts in (105) show. The
agreement restriction on adverbs is therefore the one in (106).

(106) AGREEMENT RESTRICTION FOR ADVERBS AS RESUMING ELEMENTS
       *If the resuming element is a free relative adverb, then it and the extracted
       element are relationally equivalent.*

Although simpler, I reject this statement. For in the case of PPs, it wrongly licenses a type of preposition
as resuming element, viz. what Hinrichs 1984 calls inflected prepositions, illustrated in (ii).
(ii) Ich tanze mitm   (= mit dem)   Peter.
     I   dance with.3.SG.DAT   with the.SG.DAT Peter
     I dance with Peter.
Hinrichs 1984 argues that these do neither result from a phonological process attachingh the article in its
reduced form to the preposition, nor from cliticization incorporating the article in its reduced form into
the preposition. Instead, they are best analyzed as inflected prepositions, that is, as prepositions specified
for φ-features and case. If the statement in (i) were correct, then inflected prepositions would be licensed,
contrary to fact, cf. (iii).
(iii) * **Mit wem**   glaubst du <u>mitm</u>   er sich t getroffen hat?
        with whom believe you with.3.SG.DAT he SELF   met   has
        Who do you think he met with?

Since *wann* and *wo* are not relationally equivalent, the examples mixing these two adverbs are correctly excluded. The restriction for adverbs says nothing about the morphosyntactic properties of the extracted element. This is however intended because of examples such as (107).

(107) **In welchem Haus** glaubst du   <u>wo</u>   er t wohnt?
       in which   house believe you where he   lives
       In which house do you think he lives?

In this example, an adverb is connected to a PP as an extracted element. This in itself is licit according to the agreement restriction put on both adverbs and PPs. The former one only demands relational equivalence, which is satisfied because the PP *in welchem Haus* is a locative adverbial, just like the adverb *wo* is a locative adverbial. The latter condition is satisfied vacuously because it is only defined for resuming elements that are PPs. If a PP appears as a resuming element in this example (which was the preferred option by two informants), then the agreement restriction on PPs as resuming elements is satisfied as expected.

(108) **In welchem Haus** glaubst du   <u>in dem</u>   er t wohnt?
       in which   house believe you in that.NEUT.SG.DAT he   lives
       In which house do you think he lives?

3.4.3   Summary

I have argued in this section that a successful characterization of the resuming element is possible. More specifically, I have argued for the following characterization.

(109) CHARACTERIZATION OF THE RESUMING ELEMENT
       The resuming element is a free relative proform.

In addition, I have shown that the resuming element is subject to a number of agreement restrictions, repeated in (108)-(110).

(110) AGREEMENT RESTRICTION FOR NOMINAL RESUMING ELEMENTS
       If the resuming element is a free relative pronoun, then the extracted element
       is a nominal with which the resuming element agrees in φ-features and case.

(111) AGREEMENT RESTRICTION FOR PPS AS RESUMING ELEMENTS
       If the resuming element is a free relative pro-PP, then (i) the extracted
       element is a PP such that the preposition is identical to the one in the pro-
       PP, and (ii) the nominal complements of both PPs agree in φ-features and
       case.

(112) AGREEMENT RESTRICTION FOR ADVERBS AS RESUMING ELEMENTS
       If the resuming element is a free relative adverb, then it and the extracted
       element are relationally equivalent.

3.5   A Diachronic Argument for the Novel Characterization[19]

In support of the correctness of the characterization of the resuming element as a free relative proform, I would like to mention here some data from the history of German. Wh-copying is attested in nearly all stages of German: the examples in (113) are from Middle High German (ca. 1050 – 1350), the ones in (114) from Early New Gigh German (approx. 1350 – 1650), and the one in (115) from an older stage of New High German, viz. from Schiller's *Don Carlos*.

(113) a. **Wër** wænestû <u>dër</u> t ëz sage dëm Bernære?
           who think.you who it say the Bernese
           Who do you think will say it to the one from Bern?
       b. Sagent mir **was** irselb   wollent <u>was</u> ich t herumb   thun.
           say   me what you.yourself want   what I   therefore do
           Tell me what you want that I should do about it.

                                                          (Axel-Tober 2012, p. 81)

(114) a. **Wer** meinestu   wol, <u>der</u> t ein Mitleiden mit deiner armen Seel und
           who believe.you well who a pity   with your   poor   soul and
           ihrer Verdammnus haben werde?
           her perdition   have   will
           Who do you think will have a pity on your soul and its perdition?

                                                          (Axel-Tober 2012, p. 81)

       b. Darumb wolt   er zůuersteen   geben zůuor sein rætten, **wen** er
           therefore wants he to.understand give first his advisors who he
           wolt, <u>den</u> sein kind zůman haben solt.
           wants who his child to.man have   should
           Therefore, he wanted to inform his advisors who he wants to be the
           husband of his child.

                                                          (Behaghel 1928, p. 551)

(115) **Was** wollen sie, <u>das</u> t noch geschehen soll?
       what want   you that   still happen   sould
       What do you want to happen?

                                                          (Axel-Tober 2012, p. 81)

---

[19] I am indebted to Helmut Weiß for making me aware of the work by Axel-Tober (Axel-Tober 2012).

All the examples share the features of wh-copying found in present day German: an extracted element is connected to a resuming element in clause peripheral position. What is different is that all examples except for (113b), involve d-pronouns[20]. Assuming these sentences to be representative, it seems that d-proforms were preferred over wh-proforms as resuming elements in older stages of German, in contrast to the situation in present day German. The question is: why is tis the case? The answer is relatively straightforward. As the discussion in Erdmann 1886, Karg 1923, Paul & Mitzka 1966, Paul et al. 1989, and Ebert et al. 1993 makes clear, d-proforms were standardly used as elements introducing free relative clauses in older stages of German[21]. The examples in (116) are from Old High German[22], the ones in (117) from Middle High German.

(116) a. <u>Ther</u> brut habêt, ther scal brûtigomo sîn.
       who wife has   who shall husband be
       He who has a wife shall be a husband.

(Erdmann 1896, p. 50)

    b. Sâlige sind ôc <u>them</u> hîr mildi uuirðit hugi an heliðo briostun.
       blessed are also who here mild becomes heart in heroes breasts
       Blessed are also those whose hearts becomes peaceful in their warrior breasts

(Heliand, line 1312)

(117) a. Ich bin <u>der</u> hât gewarnet die edelen fürsten rîch.
       I am who has wanred the noble prince rich
       I am the one who has warned the noble rich prince.

(Paul et al. 1989, p. 416)

    b. Sî   funden in <u>dâ</u>   er lac.
       they found   him there he lay
       They found him where he lay.

(Paul & Mitzka 1966, § 344)

Wh-proforms started to be used in addition to d-proforms in Early New High German. This variation is illustrated in (118)[23].

---

[20] Concerning 114, Axel-Tober 2012, p. 81, points out that in Schiller's time the complementizer was already orthographically distinguished from the homophonous d-pronoun (*dass* vs. *das*).

[21] This is also true for older stages of Dutch, as Norbert Corver pointed out to me (p.c., 2012/09/23). The following examples are taken from de Vooys 1949 pp. 96-7.

(i) a. Die het weet mag het zeggen.
    who it   knows can it say
    He who knows it can say it.
  b. Hi vant dien hi sochte.
    he found who he searched
    He found him who he was looking for.

[22] For the Old High German examples it is more appropriate to speak of th-pronouns; nevertheless, those are the predecessors of today's d-pronouns.

[23] That the variation in Early New High German is real and not merely a side effect of subsuming different dialects from that period under one label is suggested by the observation that one and the same text can feature both wh- and d-proforms as free relative proforms. An example of this variation is provided in (i) and (ii) from the *Teutsche Grammatica* (Engl. German Grammar) written by Valentin Ickelsamer in 1535 (cited in Kettmann 1971)

(118) a. <u>Die</u> solches thun werden das Reich   Gottes   nicht ererben!
   who such do will the kingdom god.GEN not inherit
   They, who do such things, will not inherit the kingdom of god.

                (Ebert et al. 1993, § S 273)

  b. <u>Wer</u> do gloubet vn wirdt   getaufft, der wirdt   selig.
   who there believes and becomes baptized who becomes blessed
   He, who believes and gets baptized, will be blessed.

                (Ebert et al. 1993, § S 272)

Given this oberservation, the predominance of d-pronouns comes as no surprise. I add that one of the sources for Axel-Tober, viz. Blatz 1896, even gives an example in which a complex wh-phrase appears as the extracted element connected to a d-proform as a resuming element.

(119) **Welch Jahrhundert** glaubte man <u>das</u> t mit der neuen Zahl   aufgehen werde?
  which century   believed one what with the new number arise   will
  Which century did they believe would arise with the new number?

                (Blatz 1896, p. 979)

This example (similar to example 115) is from a period in which the complementizer was orthographically distinguished from the homophonous d-proform, so that the option of analyzing (119) as a regular extraction across a complementizer can be excluded.

In sum, although the data set is meager, the few examples with wh-copying from earlier stages of German support the characterization arrived at in the previous section, viz. that the resuming element is a free relative proform.

A final remark concerning agreement in the older stages of German. It seems that agreement in case on nominal resuming elements was not necessary. Consider the following example.

(120) **Wen**   sprechen dy lute   <u>der</u> t   des   menschen sun sy?
  who.ACC speak   the people who.NOM the.GEN man.GEN son is
  Who do the people say is the man's son?

                (Axel-Tober 2012, p. 80)

In this example, the extracted subject shows up with accusative case, whereas the resuming element bears nominative case, so there is no agreement in case. But this case-mismatch has most likely nothing to do with different agreement restrictions. For in earlier stages of German, extracted subjects appear with an accusative even in

---

(i) <u>Der</u>s aber thůn will/ der můß auch trachten nach dem grund vn vrsprung der   acht hauptwörter.
 who.it but do   wants who must also strive   after the reason and origin of.the eight main words
 He who wants to do it, must also strive after the reason and origin of.the eight parts of speech.

(ii) <u>Wer</u> den teütschē ain nützliche vn verstentliche Gramatic will gebē/der můß eben   aufsehē.
 who the Germans a useful   and comprehensible grammar wants give who must therefore take.care
 He who wants to give a useful and comprehensible grammar to the Germans must therefore take care.

                (Kettmann 1971, p. 152)

The first example from page three of Ickelsamer's grammar features a d-proform as a free relative proform, whereas the second examples from page four contains a wh-proform as a free relative proform.

regular wh-question extractions[24], as pointed out by Blatz 1896 and Axel Tober 2012.

(121) a. Wen   lesen wir, daß t dem   Moses erschienen ist?
         who.ACC read we   that the.DAT Moses appeared   is
         Who do we read appeared before Moses?

(Blatz 1896, p. 978)

      b. Then   quedet ir   daz er si drúhtin unser.
         who.ACC say   you that he be lord   our
         That one, you say, is our lord.

(Axel-Tober 2012, p. 76)

So the difference between wh-copying in present day German and wh-copying in earlier stages of German is in fact a difference for extractions in general. As for what this difference is, I can only speculate. The most promising option (already foreseen by Paul 1920, § 497) is to analyze structures such as (120) and (121) as containing a subject from an embedded clause that prior to extraction was raised to an object of the main clause. For this reason, the extracted element in (120) appears with accusative marking, which is typical for objects, but never appears on unextracted subjects. The resuming element in (120) then registers the earlier status of the extracted element, viz. subject status, and therefore appears as expected with nominative case.

3.6   The Status of the Embedded Clause

The characterization of the resuming element arrived at in section 4 is repeated in (122).

(122) CHARACTERIZATION OF THE RESUMING ELEMENT
      The resuming element is a free relative proform.

This characterization is possibly open to a misunderstanding, viz. that it states that the clause containing the resuming element is a free relative clause. But this is *not* how the characterization should be understood. All that the characterization says is that the set of resuming elements is identical to the set of free relative proforms.

---

[24] As Paul Postal observes (p.c., 2013/06/30), (i) contains a wh-phrase that both originates inside the embedded clause and is accusative marked, but that is not a former subject but rather a predicate nominal.
(i) Inu huuenan meinit ir   daz ih t sii?
    Q   who.ACC mean you that I   be
    Who do you think I am?

(Axel-Tober 2012, p. 74)

I can only speculate why this example is grammatical. Either the process that raises elements of embedded clauses to matrix clause object is more general so as to apply not only to subjects, or predicate nominals are initially non-predicates (cf. Johnson & Postal 1980, pp. 212-7), which property allows them to be raised to matrix clause objects.

Importantly, what the characterizations does not say is that the clause containing the resuming element is itself a free relative clause. This is arguably not the case because the embedded clauses in wh-copying, that is, those containing the resuming element, differ from free relative clauses in German in two crucial ways.

First, the selectional relations between a free relative clause and an embedded clause in wh-copying are completely different. Whereas in free relative clauses the free relative proform is selected by both the matrix verb and the embedded verb, in wh-copying the matrix verb only selects the embedded clause but not the free relative proform functioning as the resuming element. The resuming element is selected by the embedded verb. This can be easily illustrated with the predicate *glauben* (Engl. to believe). In addition to clausal direct objects, *glauben* also permits indirect objects, marked by dative. The indirect object can of course surface as a free relative clause.

(123) a. Ich glaube ihm.
             I   believe him.DAT
             I believe him.
       b. Ich glaube <u>wem</u>   meine Eltern t vertrauen.
             I   believe who.DAT my   parents trust
             I have faith in who my parents trust.

Consequently, in (123b), *wem* is both a person who the speaker has faith in and who the speaker's parents trust. In wh-copying, however, no such co-selection is present.

(124) **Wem**   glaubst du <u>wem</u>   deine Eltern t vertrauen?
         who.DAT believe you who.DAT your parents trust
         Who do you think your parents trust?

In (124), the element *wem* is only selected by *vertrauen* but not by *glauben*. That is, whoever turns out to be the person the hearer's parents trust, it does not follow that the hearer himself has any faith in this person.

Second, as there is no selectional relation, we unsurprisingly don't observe matching effects typical for free relative clauses in German (Riemsdijk 2006, Pittner 1991, Vogel 2001). Consider first the predicate *glauben*.

(125) Ich glaube ihm/   *ihn/   *er.
          I   believe him.DAT/he.ACC/he.NOM
          I believe him.

As shown in (125), the second argument can only be marked by dative case. In a free relative clause, the free relative proform is selected by both the matrix predicate and the embedded predicate. As the examples in (126) show, a free relative clauses corresponding to the second argument can only be introduced by a free relative pronoun with dative case, simply because the free relative pronoun must be compatible with the selectional requirements of *glauben*, which only admits dative case on its second argument.

(126) a. Ich glaube <u>wem</u>   du t vertraust.
       I   believe who.DAT you trust.
       I believe who you trust.
    b.* Ich glaube <u>wen</u>   du t magst.
       I   believe who.ACC you like.
       I believe (the person) who you like.
    c.* Ich glaube <u>wer</u>   da   steht.
       I   believe who.NOM there stands
       I believe (the person) who stands there.

The contrast in (126) doesn't carry over to wh-copying sentences.

(127) a. **Wem**   glaubst du <u>wem</u>   deine Eltern t vertrauen?
       who.DAT believe you who.DAT your parents trust
       Who do you think your parents trust?
    b. **Wen**   glaubst du <u>wen</u>   deine Eltern t gesehen haben?
       who.ACC believe you who.ACC your parents seen   have
       Who do you think your parents saw?
    c. **Wer**   glaubst du <u>wer</u>   ihn t getötet hat?
       who.NOM believe you who.NOM him killed has
       Who do you think killed him?

In these examples, the resuming element can bear whatever case is compatible with the predicate of the embedded clause, irrespectively of the selectional requirements of the matrix predicate. If the embedded clause in the examples in (127) were really a free relative clause, only (127a) should be grammatical because only this example would satisfy the selectional requirements of the matrix and the embedded clause predicates. But this is not the case, arguing against a status of the embedded clause in wh-copying as a free relative clause.

To conclude, although the resuming element is a free relative proform, the clause it introduces is not a free relative clause, but simply a plain declarative embedded clause.

3.7   Some Problematic Data

It was shown in section 4 that complex wh-phrases are excluded as resuming elements. That fact was one argument for the characterization of the resuming element as a free relative proform. The relevant contrast is repeated here for convenience.

(128) a.* **Welchen Mann** glaubst du   <u>welchen Mann</u> sie t eingeladen hat?
       which   man believe you which   man   she invited   has
       Which man do you think she has invited?

     b.* **Wen** glaubst du   <u>welchen Mann</u> sie t eingeladen hat?
        who believe you which   man   she invited   has
        Which man do you think she has invited?

It turns out though that one type of complex wh-phrase shows a peculiar pattern that initially calls into question the general characterization of the resuming element as a proform. This complex wh-phrase is one of the type *wen von den NP*, an example of which is given in (129).

(129)   wen von den Männern (*which of the men*)

Complex wh-phrases of this type pattern in most respects like all other complex wh-phrases. First, they are not permitted as resuming elements if the extracted element is itself a complex wh-phrase (cf. 130).

(130)* **Wen von den Männern** glaubst du   <u>wen von den Männern</u> sie t eingeladen hat?
     who of   the men   believe you who of   the men   she invited   has
     Which of the men do you think she has invited?

Second, they permit wh- and d-pronouns as resuming element (cf. 131a and 131b) but no other pronominals (cf. 131c-131e).

(131) a. **Wen von den Männern** glaubst du   <u>wen</u> sie t eingeladen hat?
      b. **Wen von den Männern** glaubst du   <u>den</u> sie t eingeladen hat?
         who of   the men   believe you who she invited   has
      c.* **Wen von den Männern** glaubst du <u>ihn</u> sie t eingeladen hat?
         who of   the men   believe you him sie invited   has
      d.* **Wen von den Männern** glaubst du <u>wen von denen</u> sie t eingeladen hat?
      e.* **Wen von den Männern** glaubst du <u>den von denen</u> sie t eingeladen hat?
         who of   the men   believe you who of   them she invited   has
         Which of the men do you think she has invited?

Lastly, they don't permit phrases containing lexical nouns as resuming elements.

(132) a.* **Wen von den Männern** glaubst du   <u>den von den Männern</u> sie t eingeladen hat?
        who of   the men   believe you who of   the men   she invited   has
      b.* **Wen von den Männern** glaubst du   <u>die Männern</u> sie t eingeladen hat?
        who of   the men   believe you the men   she invited   has
        Which of the men do you think she has invited?

However, in contrast to all other complex wh-phrases, *wen von den* phrases are permitted as resuming elements if the extracted element is a wh-pronoun (cf. 133a), but only if it is a simple wh-pronoun (cf. 133b).

(133) a. **Wen** glaubst du <u>wen von den Männern</u> sie t eingeladen hat?
        who believe you who of   the men   she invited   has

b.* **Wen von denen** glaubst du wen von den Männern sie t eingeladen hat?
who of them believe you who of the men   she invited   has
Which of the men do you think she has invited?

Data similar to (133a) have already been observed by Fanselow & Cavar 2001.

(134) **Wen** denkst du wen von den Studenten man t einladen sollte?
who think you who of the students one invite   should
Which of the students do you think that one should invite?
(Fanselow & Cavar 2001, ex. 37)

Although these data look harmful to the characterization of the resuming element provided in section 4, they are in fact not. I argue in the remainder of this section that what appears at the position of the resuming element is not the full complex wh-phrase *wen von den Männern*, but only the wh-pronoun *wen* that was extracted out of the complex wh-phrase. This analysis is sketched in (135).

(135) **Wen**$_i$ glaubst du wen$_i$ [t$_i$ von den Männern]$_k$ sie t$_k$ eingeladen hat?
who   believe you who   of the men   she invited   has
Which of the men do you think she has invited?

This subextraction of *wen* is not as ad hoc as it appears at first glance because it is generally available[25].

(136) a. [Wen von den Männern]$_i$ hat Maria t$_i$ eingeladen?
who of the men   has Maria   invited
b. [Wen]$_k$ hat Maria [t$_k$ von den Männern] eingeladen?
who has Maria of the men   invited
c. [Wen]$_k$ hat [t$_k$ von den Männern] Maria eingeladen?
who has of the men   Maria invited
Which of the men has Maria invited?

It is important to notice that only *wen von den* type complex wh-phrases allow this subextraction; all other complex wh-phrases don't, cf. (137)-(139)[26].

---

[25] (136c) is a bit degraded with neutral intonation but becomes perfectly grammar when stress is put on *Männern*. Additional evidence for the correctness of the analysis in (135) comes from those dialects where a wh-element and a complementizer can co-occur, because at least some speakers of these dialects also accept the following sentence.
(i) **Wen** glaubst du wen dass von den Professoren die Studentin   t verführt hat?
who believe you who that of the professors   the student.FEM   seduced has
Which of the professors do you think the student has seduced?
This sentence supports the analysis in (135) because as predicted by this analysis, overt material is allowed to intervene between the part of the split constituent.
[26] I have omitted from the list *was für einen* type complex wh-phrases, even though they can be split (cf. i), and even though they allegedly permit complex wh-phrases as resuming elements (cf. ii).
(i) [Was]$_i$ hat sie [t$_i$ für einen Mann] eingeladen?
what has she for a   man   invited
What man has she invited?

(137) a. [Welchen Mann]$_i$ hat sie t$_i$ eingeladen?
    which   man   has she invited
   b.* [Welchen]$_k$ hat sie [t$_k$ Mann] eingeladen?
     which   has she man invited
    Which man has she invited?

(138) a. [Wessen Mann]$_i$ hat sie t$_i$ eingeladen?
    whose man   has she invited
   b.* [Wessen]$_k$ hat sie [t$_k$ Mann] eingeladen?
     whose has she man invited
    Whose husband has she invited?

(139) a. [Wem seinen Mann]$_i$ hat sie t$_i$ eingeladen?
    who his   man   has she invited
   b.* [Wem]$_k$ hat sie [t$_k$ seinen Mann] eingeladen?
     who has she his   man invited
    Whose husband has she invited?

This analysis receives support from the observation that *all* speakers with wh-copying accept examples such as (134), that is, sentences with *wen von den* complex wh-phrases as (alleged) resuming elements. The reason for this fact is clear: all speakers of German (whether or not they belong to the liberal variety) allow subextraction out of complex wh-phrases of the *wen von den* type[27].

(ii) Was glaubst du [was]$_i$ [t$_i$ für einen Mann]$_k$ sie t$_k$ eingeladen hat?
   what believe you what for a   man she invited   has
   What a man do you think she has invited?

It seems however doubtful to analyze (ii) as indicated, that is, as wh-copying with subextraction of *was* out of the complex wh-phrase, and more promising to analyze it plainly as a form of the WHAT-construction, as indicated in (iii).

(iii) Was glaubst du [was für einen Mann] sie t eingeladen hat?
   what believe you what for a   man she invited has
   What a man do you think she has invited?

On the one hand, the extracted element in wh-copying usually shows connectivity effects, which would not be the case in (ii). On the other hand, it is typical for the WHAT-construction not to show connectivity effects between the extracted element and the gap site. Moreover, if the extracted element and the resuming element are nominal, then they are usually subject to agreement for agreement and case features. Although agreement for case is satisfied in (ii), agreement for agreement features is violated: whereas *was* is neuter marked, *was für einen Mann* is masculine marked. Eventually, the version of (ii) with agreement is judged ungrammatical by all my informants.

(iv) *Wen glaubst du [was für einen Mann] sie t eingeladen hat?
    who believe you what for a   man she invited   has
    What a man do you think she has invited?

[27] My analysis differs from the one by Fanselow & Cavar 2001 who argue that complex wh-phrases are permitted *only* as resuming elements and *never* as extracted elements. As support, they provide the following judgement.

(i) ***Wen von den Studenten** denkst du <u>wen</u> man t einladen sollte?
   who of the students believe you who one invite should
   Which of the students do you think that one should invite?

                 (Fanselow & Cavar 2001, ex. 40)

Two remarks concerning this judgment are in order. First, as expected, the judgment is not shared by my informants (cf. 131a) as all of them accept complex wh-phrases as extracted element. This then indicates

Before concluding this section, I discuss an apparent problem with my analysis of the problematic data in terms of subextraction. The problem relates to the following datum mentioned by Fanselow & Cavar 2001.

(140) **Wieviel**   sagst du   <u>wieviel   Schweine</u> ihr t habt?
how.many say   you how.many pigs   you have
How many pigs do you say you have?

(Fanselow & Cavar 2001, p. 123)

This example is parallel to the one in (134): it has a complex wh-phrase as a resuming element and a subpart of it as the extracted element. Accepting the correctness of the analysis for (134), (140) has to have the following structure.

(141) **Wieviel**$_i$ sagst du   wieviel$_i$ [t$_i$ Schweine]$_k$ ihr t$_k$ habt?
how.many say   you how.many pigs   you   have
How many pigs do you say you have?

But such an analysis seems problematic because in Standard German *wieviel* complex wh-phrases block subextraction, as indicated in (142).

(142) a. [Wieviel   Schweine]$_i$ habt ihr t$_i$?
        how.many pigs   have you
    b.* [Wieviel]$_k$ habt ihr [t$_k$ Schweine]?
        how.many have you   pigs
        How many pigs do you have?

But this problem is only apparent because Gisbert Fanselow informed me (p.c., 2010/02/18) that the subextraction in (142b) *is* in fact grammatical for the speakers whose judgments Fanselow & Cavar 2001 cite. Therefore, the analysis in (141) is independently motivated for these speakers. In addition, their informants also accept *wieviel* as a free relative proform, which is fully in line with the characterization of the resuming element as free relative proform.

(143) Ich esse <u>wieviel</u>   ich t will.
    I   eat how.many I   want
    I eat as much as I want.

In sum, the problematic data are only apparently such because they receive an analysis that is compatible with the characterization of the resuming element as free relative proforms.

---

that Fanselow & Cavar 2001 report data from the more restrictive variety where complex wh-phrases are usually ungramamtical as extracted elements. Second, although I myself belong to this variety and do see a contrast beween this sentence and the one in (134), I would nevertheless not judge either sentence as ungrammatical. I return to this surprising behavior of this type of complex wh-phrase in chapter 8.

3.8   Implications for the Standard Variety

Most of the examples presented so far came from the liberal variety of wh-copying, that is, from a variety in which complex wh-phrases are permitted as extracted elements and in which d-pronouns can appear as resuming elements. It was also mainly these data on which the characterization was developed that the resuming element is a free relative proform. It is therefore fair to ask whether the characterization arrived at is also valid in that variety of wh-copying (henceforth, the *standard variety*) where neither complex wh-phrases nor d-pronouns are permitted[28], that is, in which all those elements are excluded whose behavior indicated that the resuming element is not fully identical to the extracted element. The purpose of this short section is to show that based on the behavior of certain adverbs, the novel characterization of the resuming element is at work even in the standard variety.

In the standard variety, the characterization I argued for is almost indistinguishable from the position that the resuming element and the extracted element are fully identical. This is so because neither complex wh-phrases nor d-pronouns are permitted so that only wh-proforms appear as both extracted elements and as resuming elements. Importantly, basically all wh-proforms are both permitted as question words and as free relative introducers. This is illustrated for wh-pronouns, wh-adverbs, and PP wh-proforms in (144)-(146), respectively.

(144) a. **Wer** glaubst du   <u>wer</u> t Maria liebt?
           who believe you who   Mary loves
           Who do you think loves Mary?
       b. <u>Wer</u> schön   sein will   muss leiden.
           who beautiful be   wants must suffer
           He, who wants to be beautiful, has to suffer.

(145) a. **Wann** glaubst du   <u>wann</u> sie   sich t getroffen haben?
           when believe you when they SELF met   have
           When do you think that they met?
       b. Ich werde ankommen <u>wann</u> Maria t ankommt.
           I will   come   when Maria comes
           I will arrive at the same time Mary arrives.

(146) a. **Worauf** glaubst du   <u>worauf</u> er sich t freut?
           what.on believe you what.on he SELF looks.forward
           What do you think he is looking forward to?
       b. Ich freue   mich <u>worauf</u> ich schon   lange t warte.
           I   look.forward me   what.on I   already long   wait.
           I'm looking forward to what I wait for already for a long time.

---

[28] I return to this variety in more detail in chapter 8 and discuss a possible explanation for the exclusion of the majority of complex wh-phrases (cf. fn. 28).

These data are in fact compatible with either the view that the resuming element is a copy of the extracted element or the view that resuming element is a free relative proform. However, the overlap indicated in (144)-(146) is far from complete.

In German, there are a number of reason adverbs, all corresponding to *why*, and there are a number of conditional adverbs, all corresponding to *to what extent*, (cf. 147 & 148).

(147) a. Weshalb   weint sie t?
      b. Warum   weint sie t?
      c. Wozu   weint sie t?
      d. Weswegen weint sie t?
      e. Wieso   weint sie t?
         why   cries she
         Why does she cry?

(148) a. Inwieweit   hat sie t Recht?
      b. Inwiefern   hat sie t Recht?
         to.what.extent has she right
         To what extent is she right?

As shown, all of them are permitted as question words. However, none of them are fully grammatical in wh-copying (cf. 149 and 150)[29].

(149) a ?**Weshalb**   glaubst du weshalb   sie t weint?
      b.??**Warum**   glaubst du warum   sie t weint?
      c.* **Wozu**   glaubst du wozu   sie t weint?
      d.* **Weswegen** glaubst du weswegen sie t weint?
      e.* **Wieso**   glaubst du wieso   sie t weint?
         why   believe you why   she cries
         Why do you think she cries?

(150) a.* **Inwieweit**   glaubst du inwieweit   sie t Recht hat?
      b.* **Inwiefern**   glaubst du inwiefern   sie t Recht hat?
         to.what.extent believe you to.what.extent she right has
         To what extent do you think she's right?

These judgments are problematic for the view according to which the resuming element is fully identical to the extracted element because all elements permitted as question words should equally be permitted as resuming elements. However, these data are no problem for the characterization of the resuming element as a free relative proforms. For all these adverbials are – with one exception – equally bad as free relative proforms.

(151) a. ?Ich komme weshalb   man mich t gerufen hat.
      b.??Ich komme warum   man mich t gerufen hat.

---

[29] The judgments given in (150) and (151) reflect the author's intuitions.

    c.* Ich komme <u>wozu</u>   man mich t gerufen hat.
    d.[√] Ich komme <u>weswegen</u> man mich t gerufen hat.
    e.* Ich komme <u>wieso</u>   man mich t gerufen hat.
      I   come   why   one me   called has
      I come for the reason for which I was called.

(152) a.* Sie hat Recht <u>inwieweit</u>   er auch t Recht hat.
      b.* Sie hat Recht <u>inwiefern</u>   er auch t Recht hat.
         she has right to.what.extent he also   right has
         She is right to the extent to which he is right.

So, in general, the novel characterization of the resuming element as free relative proform even shows up in the standard variety. I say 'in general' because the wh-adverbial *weswegen* is well-formed as a free relative proform but not in wh-copying. This is however not a problem. Consider again the characterization of the resuming element, repeated here for convenience.

(153) CHARACTERIZATION OF THE RESUMING ELEMENT
      The resuming element is a free relative proform.

This statement is in fact a clause with a hidden material implication. What the characterization states more precisely is articulated in (154).

(154) For all x, if x is a resuming element, then x is also a free relative proform.

This formal articulation of the characterization now reveals why the grammaticality contrast between (149d) and (151d) is no problem: it is no problem because a material implication is true even if the antecedent is false. In other words, the fact that *weswegen* is ungrammatical as a resuming element but is grammatical as a free relative proform is no problem for the characterization. The only case that would cause trouble would be one in which an element is permitted as a free relative proform but not as a resuming element. However, I am not aware of any such case.
One might object that this argument crucially hinges on the choice of the antecedent and the consequent in the implication that formally restates the characterization of the resuming element. So, the data with *weswegen* would be problematic after all if the characterization of the resuming element were given the following formal restatement:

(155) For all x, if x is a free relative proform, then x is also a resuming element.

For then, the antecedent would be true and the consequent would be false in the case of *weswegen*. However, this alternative statement in (155) is incorrect for a simple reason: it would entail that all speakers accepting free relative clauses also accept wh-copying. This, however, is definitely not the case: whereas *all* speakers of German accept free relative clauses, only some of them accept wh-copying.

In sum, the standard variety, in which neither complex wh-phrases nor d-pronouns are permitted, is not only compatible with the novel characterization arrived at in this chapter, it even provides additional evidence for the correctness of it.

3.9   Summary

In this chapter, I have first investigated the position the resuming element occupies. It was argued that its restricted distribution is best characterized in the following manner.

(156) POSITION OF THE RESUMING ELEMENT
        The resuming element occupies a clause left peripheral position.

On the basis of new data involving d-pronouns and complex wh-phrases in wh-copying, I have argued that the resuming element is clearly different from the extracted element, and that the set of resuming elements is characterized by the following constraint.

(157) CHARACTERIZATION OF THE RESUMING ELEMENT
        The resuming element is a free relative proform.

In addition to this, it was also argued that the resuming element is subject to the following agreement restrictions.

(158) AGREEMENT RESTRICTION FOR NOMINAL RESUMING ELEMENTS
        If the resuming element is a free relative pronoun, then the extracted element is a nominal with which the resuming element agrees in φ-features and case.

(159) AGREEMENT RESTRICTION FOR PPs AS RESUMING ELEMENTS
        If the resuming element is a free relative pro-PP, then (i) the extracted element is a PP such that the preposition is identical to the one in the pro-PP, and (ii) the nominal complements of both PPs agree in φ-features and case.

(160) AGREEMENT RESTRICTION FOR ADVERBS AS RESUMING ELEMENTS
        If the resuming element is a free relative adverb, then it and the extracted element have to be relationally equivalent.

Chapter 4

Consequences for Previous Approaches to Wh-Copying

4.1 Introduction

In the previous chapter, I investigated the question *what* is permitted as a resuming element and *where*. Regarding the first question, I argued on the basis of mainly new data that the resuming element is an *agreeing free relative proform*, that is, a proform that is taken from the set of free relative proforms and that agrees in a number of features with the extracted element. Concerning the second question, I showed that the resuming element occupies a clause left peripheral position, that is, the position designated for extracted elements in general. The aim of this chapter is to investigate whether these properties of the resuming element are compatible with the answers given by previous approaches as to *how* the resuming element is grammatically permitted to occur. I show that these approaches are not well suited for a satisfactory analysis of the resuming element. They can either not account for the characterization of the resuming element in terms of an agreeing free relative proform *at all*, or they can account for the properties of the resuming element only by treating these properties as *accidental*, that is, as properties that are not motivated by the assumptions defining this analysis, which is unsatisfactory because then the analysis begs the question *why* the resuming element has the properties it has.

The chapter is organized as follows. In section 2, I first compare the characterization arrived at in the previous chapter with previous ones and show that the novel characterization of the resuming element as an agreeing free relative proform is superior to the previous ones. I then turn to the analyses in which the previous characterizations are embedded in section 3 and ask whether these analyses are compatible with the novel characterization. More specifically, I ask whether they can be adjusted in such a way as to be able to account for the properties that are covered by the novel characterization in a principled, non *ad hoc* manner. It turns out that the analyses cannot be adjusted, except for one. However, as I discuss in detail in section 4, this adjustable analysis leads to an account in which the properties of the resuming element can only be treated in an *ad hoc* fashion. The chapter closes with a summary and an outlook in section 5.

4.2   The Superiority of the Novel Characterization

In this section, I argue that the characterization of the resuming element as an agreeing free relative proform is superior to all other characterizations previously suggested in the literature. More specifically, I show that all other characterizations either exclude wh- or d-proforms, or include elements distinct from both wh- and d-proforms. In other words: it is only the characterization of the resuming element as a free relative proform that includes only wh- and d-proforms.
The previous characterizations of the resuming element are repeated in (1).

(1)   The set of resuming elements consists of
       a.   interrogative wh-phrases
       b.   wh-phrases lacking a [+wh]-feature
       c.   indefinite pronouns
       d.   relative pronouns
       e.   definite & indefinite pronouns
       f.   wh-pronouns & relative pronouns
       g.   agreeing complementizers

I exclude from the following discussion the characterization of the resuming element as an agreeing complementizer (cf. 1g); I postpone its discussion to the next section because this characterization is solely based on the analysis in which it is embedded. In addition, I refrain from a separate discussion of the characterizations in (1e) and (1f); as they are formulated conjunctively, their truth depends on the truth of each conjunct. And as I show in the discussion of (1c) and (1d), one of their conjuncts is arguably false so that the conjunct as a whole is false as well.

4.2.1   The Resuming Element ≠ an Interrogative Wh-Phrase

Treating the resuming element as an interrogative wh-phrase clashes with two observations. First, it predicts that complex wh-phrases, that is, wh-phrases containing a lexical noun, should be accepted as resuming element because as documented in the previous chapter, some speakers do allow complex wh-phrases in wh-copying. But as also shown in the previous chapter, complex wh-phrases cannot function as resuming elements.

(2)   * **Welchen Mann** glaubst du   <u>welchen Mann</u> sie t eingeladen hat?
         which   man   believe you which   man   she invited   has
         Which man do you think she has invited?

Second, it also predicts that d-proforms should not be suitable resuming elements because they are not interrogative (cf. 3).

(3)   * <u>Den</u> hast du t gesehen?[55]
        who have you   seen
        Who did you see?

But as was shown, d-proforms *are* accepted as resuming elements by some speakers.

4.2.2   The Resuming Element ≠ Wh-Phrase Minus a [+wh]- Feature

This proposal correctly includes wh- and d-proforms: d-pronouns do not bear the [+wh]-marking (cf. 3), and wh-proforms don't bear it obligatorily (cf. 4).

(4)   Ich sehe <u>wen</u>.
        I   see who
        I see someone.

However, the proposal also allows elements not accepted as resuming elements, viz. phrases corresponding to complex wh-phrases but without a [+wh]-features, as illustrated in (5).

(5)   a.* **Welchen Mann** glaubst du   <u>den Mann</u> sie t eingeladen hat?
            which   man   believe you the man   she invited   has
        b.* **Welchen Mann** glaubst du   <u>diesen Mann</u> sie t eingeladen hat?
            which   man   believe you this   man   she invited   has
            Which man do you think she has invited?

Given the ungrammaticality of these sentences, this proposal must be dismissed, too.

4.2.3   The Resuming Element ≠ an Indefinite Proform

Analyzing the resuming element as an indefinite proform faces three problems. First, it wrongly excludes d-proforms, since these cannot be used as indefinites.

(6)   * Ich sehe <u>den</u>.[56]
        I   see who
        I see someone.

Second, although most wh-proforms can be used as indefinites (cf. 3), some adverbial wh-proforms cannot, for example *wann* (when) and *wo* (where).

---

[55] This sentence is of course grammatical with a yes/no question interpretation 'Have you seen HIM?'.
[56] This sentence with *den* is of course grammatical with the irrelevant meaning 'I see him'.

(7)   a.* Ich ruf dich <u>wann</u> an.
             I   call you when on.
             I call you at some point.
        b.* Ich hab ihn <u>wo</u>   abgesetzt.
             I   have him where dropped.off
             I dropped him off somewhere.

Both are nevertheless perfectly fine as resuming elements.

(8)   a. **Wann** glaubst du <u>wann</u> wir uns t treffen sollten?
             when believe you when we us   meet   should
             When do you think we should meet?
        b. **Wo**   glaubst du <u>wo</u>   wir uns t treffen sollten?
             where believe you where we us   meet   should
             Where do you think we should meet?

Finally, indefinite proforms in general are banned from the clause peripheral
position (cf. 9).

(9)   a.* <u>Wen</u> wird Maria schon   t finden früher oder später.[57]
             who will Mary already find   sooner or   later
             In the long run, Mary will find someone.
        b.* Ich glaube <u>wen</u> wird Maria schon   t finden früher oder später.[58]
             I   believe who will Mary already find   sooner or   later
             I believe that in the long run, Mary will find someone.

But this is clearly incompatible with the observation that the resuming element must
occupy a clause peripheral position. So if the resuming element were really an
indefinite proform, it would be permitted in a position from which such elements are
usually banned.

4.2.4   The Resuming Element ≠ a Relative Proform

The analysis of the resuming element as relative proform runs into two problems.
First, it wrongly excludes wh-pronouns as resuming elements because they are
usually not permitted as relative proforms, but only d-proforms are[59].

---

[57] This sentence is of course grammatical with the question interpretation *Who will Mary find in the long run?*

[58] This sentence is ungrammatical even with a question interpretation because the matrix predicate *glauben* does not allow for embedded questions. Incidentally, this shows that the ungrammaticality of (22a) is not due to a preference for an interrogative interpretation because no such interpretation is available in (22b), yet the sentence is ungrammatical.

[59] The only exception to this generalization is the wh-pronoun *was*, which can be used as a relative pronoun, especially when the head noun does not contain a lexical noun. I ignore this complication here and throughout the remainder of this work. I should stress here that German differs from Dutch

(10)   a.* Der Mann <u>wen</u> sie t liebt ist ein Idiot.
        b. Der Mann <u>den</u> sie t liebt ist ein Idiot.
            The man who she loves is an idiot.

Second, relative proforms include pronominal like elements such as *welchen*.

(11)   Der Mann <u>wen</u>   sie t liebt ist ein Idiot.
        the man   which she loves is an idiot
        The man who she loves is an idiot.

But this contrasts with the behavior of these elements in wh-copying, which as shown in the previous chapter, are not permitted as resuming elements.

(12) * **Welchen Mann** glaubst du   <u>welchen</u> sie t eingeladen hat?
        which   man   believe you which   she invited   has
        Which man do you think she has invited?

Therefore, this characterization is also untenable.
In sum, all the previous characterizations of the resuming element are incompatible with the properties of the resuming element documented in the previous chapter.

4.3   A Discussion of the Previous Analyses

The discussion in the previous section has so far only focused on the characterizations themselves and whether or not they are tenable. And although the result was negative for all previous characterizations, this discussion was slightly unfair. For all these characterizations are embedded within specific analyses of wh-copying and the resuming element, and these analyses might after all be compatible with the properties of the resuming element. So the real issue to discuss is whether the analyses proposed so far might be adjusted in such a way as to be compatible with these properties. This question is the subject of this section. Before I discuss the analyses in light of the properties of the resuming element, I list the relevant analyses. There are in total five analyses that have been suggested for wh-copying in general and for the resuming element in particular.
The first one is the *full copy analysis*, according to which the resuming element is a full copy of the extracted element, that is, the extracted element and the resuming element are identical in all aspects. This analysis is by far the most widely assumed analysis. It has been adopted by a number researchers for wh-copying in German

concerning the availability of wh-pronouns because in Dutch, wh-pronouns are grammatical as relative pronouns when contained inside a PP.
(i) De man met wie   ik in de winkel stond te praten is mijn oom.
     the man with whom I in the shop   stood to talk   is my   uncle
     The man who I was talking to in the shop is my uncle.

(Alber 2008; Anyadi & Tamrazian 1993; Fanselow & Mahajan 2000; Fanselow & Cavar 2000; Höhle 2000; Nunes 2001, 2004; Pafel 2000; Rett 2006), and basically by all researchers analyzing wh-copying in languages other than German, such as Afrikaans (Plessis 1977), Frisian (Hiemstra 1986a, 1986b), Passamaquoddy (Bruening 2006), and Punjabi (Yang 2008).

The second analysis is the *cleft analysis*, according to which wh-copying is a cleft in disguise and the resuming element is a relative proform. This analysis has been adopted by Koster 2009.

The third analysis is the *complementizer agreement analysis*, which treats the resuming element as a complementizer that agrees with the extracted element in a number of features. The result of this is a change in the form of the complementizer, leading to the shape of the resuming element. This analysis has been put forward by Thornton 1990 and Kampen 1997.

The fourth analysis adopted is the *extracted resumptive pronoun analysis*, according to which the resuming element is an extracted resumptive pronoun. What this means is that the extracted element leaves behind a resumptive pronoun at the gap site that itself undergoes extraction to the clause initial position of the embedded clause. This extracted pronoun then corresponds to the resuming element. This analysis was adopted by McDaniel 1986.

The fifth and last analysis that has been suggested is the *partial copy analysis*. This analysis considers the resuming element to be only partially identical to the extracted element. This partial identity can be the result either from an inherent difference between the copies corresponding to the extracted element and the resuming element or from subextraction. This analysis has been adopted for German by Felser 2004 and Pankau 2009, and for Dutch by Barbiers et al. 2010.

The correspondences between the previous characterizations of the resuming element and the analyses in which they are embedded are provided in (13).

(13) interrogative wh-phrases   → full copy analysis
      wh-phrases lacking a [+wh]-feature → partial copy analysis
      indefinite pronouns   → partial copy analysis
      relative pronouns   → partial copy analysis, cleft analysis
      definite & indefinite pronouns   → partial copy analysis
      wh-pronouns & relative pronouns   → extracted resumptive pronoun analysis
      agreeing complementizers   → complementizer agreement analysis

The focus of what follows is on whether these analyses can be modified in such a way as to be compatible with the properties of the resuming element. The discussion starts with the full copy analysis, I then turn to the cleft analysis, proceed with the complementizer agreement analysis, investigate the extracted resumptive pronoun analysis, and finally deal with the partial spell out analysis.

4.3.1 The Full Copy Analysis

The analysis exploits the idea that extraction of an element does not proceed in one fell swoop but in smaller steps, that is, *successive cyclically*, leaving behind a copy of the extracted element in every intermediate SpecCP-position, the position corresponding to the clause left peripheral position. The resuming element is then nothing but an instance of a spelled out copy of the extracted element in the SpecCP position. This analysis is sketched in (14).

(14)   [CP [SpecCP **wen**] glaubst du [CP [SpecCP wen] sie ~~wen~~ liebt]]
                  who believe you   who she who loves
         Who do you think she loves?

The wh-phrase in (14) originates in an argument position, is then moved to the SpecCP position of the embedded clause, and finally to the matrix SpecCP position. The copy in the argument position is deleted, whereas the other two copies in SpecCP are spelled out.

This analysis has the benefit that it can fairly easily account for the position of the resuming element because it occupies the same position extracted elements generally occupy, viz. SpecCP. Moreover, the agreement restrictions put on the resuming element and the extracted element are of no problem either: they follow trivially from the full identity between the extracted element and the resuming element. However, the assumption that the extracted element and the resuming element are fully identical is also the reason why this analysis cannot be modified to explain all the properties of the resuming element. For as documented in the previous chapter, the extracted element and the resuming element are *not* always identical. Ignoring the fact that the resuming element is a free relative proform, what is harmful to this analysis is the very fact that only proforms are permitted as resuming elements. For given the full identity between the extracted element and the resuming element claimed to hold in this analysis, the presence of proforms can only be accounted for by assuming that only proforms are possible as extracted elements, too[60]. But as I have shown in the previous chapter, this is not the case: also complex wh-phrases are permitted as extracted elements, and also in that case only proforms are permitted as resuming elements, cf. (15).

(15)   a. **Welchen Mann** glaubst du *welchen Mann/√den sie t eingeladen hat?
                 which   man believe you which   man   who she invited   has
                 Which man do you think she has invited?
         b. **Mit welchem Mann** glaubst du *mit welchem Mann/√mit dem er t tanzt?
                 with which   man believe you with which   man   with whom he dances
                 Which man do you think he dances with?
         c. **In welchem Haus** glaubst du *in welchem Haus/√wo/ √in dem er t wohnt?
                 in which   house believe you in which   house where in what he lives
                 In which house do you think he lives?

---

[60] This is in fact a common assumption in the literature on wh-copying, cf. Fanselow & Mahajan 2000, p. 221; Felser 2004, p. 550; Haider 2010, p. 108; Pafel 2000, p. 338; Rett 2006, p. 371.

What the full copy analysis therefore fails to account for is that the presence of proforms as resuming elements is independent of the status of the extracted element, that is, independent of whether or not the extracted element is a proform. Fixing this defect can only be achieved by giving up the fundamental assumption of this analysis, viz. the hypothesis that the extracted element and the resuming element are fully identical. Consequently, this analysis cannot be successfully modified.

4.3.2   The Cleft Analysis

Koster 2009 has put forward an analysis for wh-copying that analyzes it as a cleft in disguise. He assumes that the extracted element corresponds to a clefted constituent that underwent question extraction, and that the resuming element corresponds to the relative proform that heads the restrictive relative clause embedded under the clefted constituent; the clefted constituent and the proform are then connected via binding. His analysis is sketched in (16b) for the sentence in (16a); numerical subscripts indicate binding, alphabetical subscripts indicate extraction.

(16)   a.   **Wer** glaubst du $\underline{\text{wer}}$ t den Hans kennt?
              who believe you who the Hans knows
              Who do you think knows Hans?
       b.   **Wer**$_{1,i}$ ist es t$_i$ $\underline{\text{wer}}_{1,k}$ t$_k$ den Hans kennt?
              who   is it   who   the Hans knows?
              Who is it that knows Hans?

In order to account for presence of expressions such as *glaubst du* and for the non-presence of the expression *ist es*, Koster assumes that the former expression is inserted as a parenthetical, whereas the latter one is deleted. One then arrives at the structure in (17) as the final structure for (16a).

(17)   **Wer**$_{1,i}$ ~~ist es~~ t$_i$ glaubst du $\underline{\text{wer}}_{1,k}$ t$_k$ den Hans kennt?
              who   is it   believe you who   the Hans knows?
              Who do you believe knows Hans?

This analysis can easily account for the fact that only proforms appear as resuming elements because restrictive relative clauses are also only introduced by proforms. Moreover, as nothing bars clefted constituents containing lexical nouns, correspondingly nothing bars complex wh-phrases as extracted elements in wh-copying. Finally, since the relative proform occupies a clause left peripheral position, the position of the resuming element is also accounted for.
Nevertheless, Koster's analysis faces two problems. The first problem is that it gives the wrong set of proforms as resuming elements, viz. relative proforms opposed to free relative proforms. The second, and possibly more serious problem for Koster's analysis are the agreement restrictions characterizing the resuming element. More specifically, it cannot account for the full range of agreement restrictions put on the

resuming element. Under Koster's analysis, a wh-copying structure contains two chains, that is, two independently extracted items. The first item corresponds to the extracted element, the second one to the resuming element. Each extracted item is subject to independent selectional constraints regarding case and prepositional marking. Since the selectional restrictions are independent of each other, case and prepositional marking on the two extracted items is predicted to be able to differ. In other words, Koster's analysis predicts that case and prepositional marking on the extracted element and on the resuming element can differ. However, as I have shown in the last section, the opposite is the case: case and prepositional marking have to be identical. To make this abstract discussion clear, a clefted constituent in German invariably shows up as a nominative marked NP[61], whereas the proform in the relative clause can be either an NP with whatever case marking or a PP, as shown in (18).

(18)   a. $Wer_{1,i}$ ist es t_i $den_{1,k}$ Maria t_k liebt?
            who.NOM is it   who.ACC Maria   loves
            Who is it that Maria loves?
       b. $Wer_{1,i}$ ist es t_i $dem_{1,k}$ Maria t_k hilft?
            who.NOM is it   who.ACC Maria   loves
            Who is it that Maria helps?
       c. $Wer_{1,i}$ ist es t_i [an den_1]$_k$ Maria t_k denkt?
            who.NOM is it   on who.ACC Maria   thinks
            Who is it that Maria thinks of?
       d. $Was_{1,i}$ ist es t_i [an das_1]$_k$ Maria t_k denkt?
            what.NOM is it   on that   Maria   thinks
            What is it that Maria thinks of?

The only identity required in clefts is identity for person, number, and gender features between the clefted constituent and the relative proform, which of course follows from the fact that binding requires precisely these features to be identical. Now, if the sentences in (18) were the basis for wh-copying, one expects the corresponding wh-copying sentences to be grammatical, too. But they aren't, as illustrated in (19).

(19)   a.* **Wer**   glaubst du <u>den</u>   Maria t liebt?
            who.NOM believe you who.ACC Maria   loves
            Who do you think Maria loves?
       b.* **Wer**   glaubst du <u>dem</u>   Maria t hilft?
            who.NOM believe you who.DAT Maria   helps
            Who do you think Maria helps?

---

[61] In all honesty, I have not checked whether this is really the case for the speakers of the liberal variety of wh-copying. Nevertheless, even if this restriction did not hold, the general problem of Koster's analysis remains, viz. that the extracted element and the resuming element are predicted to be different from each other in terms of case and prepositional marking, given their selectional independence.

c.* **Wer**   glaubst du   an <u>den</u>   Maria t denkt?
who.NOM believe you on who.ACC Maria   denkt
Who do you think Maria thinks of?
d.* **Wer**   glaubst du   an <u>das</u> Maria t denkt?
what.NOM believe you on that Maria   denkt
What do you think Maria thinks of?

So what the cleft analysis can deal with is agreement for φ-features between the extracted element and the resuming element. However, all other agreement restrictions are unaccounted for, that is, all agreement restrictions regulating the distribution of case and prepositions. Furthermore, the restriction that only NPs are permitted as clefted constituents makes the wrong prediction that only NPs are permitted as extracted elements, which is fatal as well because as documented in the previous chapter 3, also PPs and adverbs are permitted as extracted elements. In other words, this analysis predicts the sentences in (20) to be ungrammatical because of the ungrammaticality of their source structures in (21), all of which are ungrammatical cleft structures.

(20)   a. **An wen**   denkst du <u>an wen</u>   sie t einen Brief schreibt?
on who.ACC believe you on who.ACC she a   letter writes
Who do you think she writes a letter to?
b. **In welchem Haus** glaubst du   <u>wo</u>   er t wohnt?
in which   house believe you where he   lives
In which house do you think he lives?
c. **Wo** glaubst du <u>wo</u>   er t wohnt?
where believe you where he   lives
Where do you think he lives?

(21)   a.* [An wen]$_{1,i}$ ist es t$_i$ [an wen]$_{1,k}$ sie Briefe t$_k$ schreibt?
on who.ACC is it   on who.ACC she letters   writes
Who is it that she writes letters to?
b.* [In welchem Haus]$_{1,i}$ ist es t$_i$ wo$_{1,k}$ sie t$_k$ wohnt?
in which   house is it   where she   lives
Which house is it where she lives?
c.* Wo$_{1,i}$ ist es t$_i$ wo$_{1,k}$ sie t$_k$ wohnt?
where is it   where she   lives
Where is it where she lives?

In a nutshell, agreement between a clefted constituent and the proform it is connected to in the embedded clause in cleft constructions differs considerably from the agreement effects holding between the extracted element and the resuming element in wh-copying. This difference is expected because a cleft has two extracted elements, viz. the clefted constituent and the proform in the embedded clause, each of which satisfies separate connectivity requirements imposed on them by the gap site. Modifying the agreement restrictions for clefts in such a way as to be compatible with the agreement restrictions of wh-copying amounts to abandoning a cleft analysis of wh-copying. For then, wh-copying would no longer show any signs

of a cleft construction in disguise, as no evidence would point to two separate extractions in the first place. As this assumption is however at the core of the cleft analysis of wh-copying, it is impossible to modify as well.

4.3.3   The Complementizer Agreement Analysis

Similar to the full copy analysis, the complementizer agreement analysis also capitalizes on the idea that extraction proceeds through intermediate SpecCP position, but differs from the full copy analysis in analyzing the resuming element as an agreeing complementizer. Specifically, it is assumed that the complementizer in intermediate position has unvalued φ-features which get valued by the wh-element in the intermediate SpecCP position, through which it proceeded on its way to the matrix SpecCP position. The agreement between C° and the wh-phrase in SpecCP results from the configuration both elements appear in, viz. the Spec-Head configuration. As this configuration is the canonical configuration licensing agreement (at least within the framework adopted by Thornton 1990 and Kampen 1997), the features on C° can get valued only by the features on the wh-element in SpecCP. As a side effect, the phonological shape of the C°-head is altered, and it appears as a wh- or d-proform. The analysis is illustrated in (22).

(22)
$[_{CP}[_{SpecCP}$ wen$]$ glaubst du $[_{CP}[_{SpecCP}$ ~~wen~~$]$ $[_{C°[P: \_; N: \_; GN: \_]}$ Ø$]$ sie ~~wen~~ liebt$]]$
$\downarrow$

$[_{CP}[_{SpecCP}$ wen$]$ glaubst du $[_{CP}[_{SpecCP}$ ~~wen~~$]$ $[_{C°[P: 3; N: SG; GN: MSC]}$ wen$]$ sie ~~wen~~ liebt$]]$

Similar to the cleft analysis, the complementizer agreement analysis has no problem in explaining that the proform status of the resuming element is independent of the status of the extracted element because the resuming element is the result of an agreement operation, and this operation is insensitive to whether or not the agreement controller is a proform. But apart from general problems with this analysis[62], it faces two fatal problems.

First, it can't account for the full range of agreement restrictions on the resuming element. This analysis can of course account for agreement for φ-features between the extracted element and the resuming element because C° is specified precisely for these features, that is, person, number, and gender. However, the resuming element also agrees in case with the extracted element, and if the resuming element is a PP,

---

[62] In general, if wh-copying were an instance of complementizer agreement it would be a very weird one. On the one hand, complementizer agreement is normally restricted to features that a verb can be specified for; but the resuming element is also marked for gender and case features, which are never expressed on verbs in German. On the other hand, wh-copying is optional for some speakers, that is, the presence of a resuming element is not obligatory for them; in this analysis, this must be interpreted as optional agreement, something normally not found in German either. Moreover, there is absolutely no connection between the standard type of complementizer agreement and wh-copying: many speakers accepting wh-copying do not have agreeing complementizers of the standard type; and many speakers accepting agreeing complementizers of the standard type do not allow for wh-copying.

then the extracted element has to be a PP of the relevant type as well, that is, a PP headed by the same preposition. Moreover, this analysis is at odds with adverbs as resuming elements, especially when connected to a PP, because adverbs are not specified for φ-features, whereas the extracted PP could provide C° with these features. In other words, the complementizer agreement analysis cannot explain (i) why an NP as a resuming element has to be connected to an NP as an extracted element bearing the same case features (cf. 23a), (ii) why an NP cannot be connected to an extracted element that is a PP (cf. 23b), and (iii) why PPs and adverbs are permitted as resuming elements, since these elements are specified either for more or less features than specified on C°, cf. (23c) &)23d), respectively.

(23)   a.* **Wen**   glaubst du   <u>wem</u>   sie t die lateinische Sprache lehrt?
            who.ACC believe you who.DAT she the Latin   language teaches
            Who do you think she teaches Latin?
       b.* **An wen**   denkst du   <u>wem</u> sie t einen Brief schreibt?
            on whom think   you who she a   letter writes
       c. **An wen**   denkst du   <u>an wem</u> sie t einen Brief schreibt?
            on whom think   you on whom she a   letter writes
            Who do you think she writes a letter to?
       d. **In welchem Haus** glaubst du   <u>wo</u>   er t wohnt?
            in which   house believe you where he lives
            In which house do you think he lives?

Fixing this defect by suggesting that C° is specified for more than unvalued φ-features is impossible, for a simple reason, which has to do with PPs. The position hosting the complementizer is C°, a head. Independent of what features one wants to add to C°, the element resulting from the agreement operation is predicted to be always a head as well. However, PPs as well are possible as resuming elements, but they are clearly not heads but phrasal expressions.
The second argument supporting this negative conclusion has nothing to do with the agreement properties of the resuming element but with its position. The resuming element occupies the canonical position for extracted elements, which is identified as SpecCP and not C° internal to the framework Thornton 1990 and Kampen 1997 adopt. One of the arguments that the resuming element occupies SpecCP and not C° comes from the observation that those dialects of German that permit the cooccurrence of an extracted element and a complementizer also permit the cooccurrence of a resuming element and a complementizer.

(24)   **Wer** glaubst du <u>wer</u> dass du t bist?
        who believe you who that   you   are
        Who do you think you are?

(Fanselow & Mahajan 2000, p. 222)

If the resuming element were an agreeing complementizer, the datum in (24) would be unexpected: if the resuming element is a disguised complementizer, then they should not appear together, as a position can only be filled by one element. This defect looks like it is easy to fix because the assumption that there is only one

complementizer position in the relevant dialects might be incorrect in light of the fact that these dialects do in fact allow more than one complementizer, cf. (25).

(25)   Ich frage mich ob   dass Maria ausgegangen ist.
       I   ask   me   whether that Maria went.out   is
       I wonder whether Maria went out.

This observation is of no help though because the second complementizer in this example, viz. *ob* (Engl. whether), is permitted only in embedded *questions*. The embedded clause in wh-copying however is not an embedded question as argued in chapter 2 so that no second complementizer position related to *ob* is available. Moreover, that no second complementizer position related to the declarative complementizer *dass* is available either can be concluded from the ungrammaticality of (26).

(26) *Ich glaube dass dass Maria Hans liebt.
      I   believe that that Maria Hans loves
      I believe that Mary loves Hans.

Rejecting an analysis that involves two declarative complementizers on the basis of (26) might be too hasty though. For it is also known that German does allow two declarative complementizers under certain circumstances in embedded clauses, firstly discussed in Grewendorf 2009.

(27)   Ich weiß dass den Peter_i dass den_i jeder   t mag.
       I   know that the Peter that him everyone   likes
       I know that as for Peter, everyone likes him.

In (27), topicalization internal to the embedded clause took place, and it is in these contexts that two declarative complementizers appear. The natural step to take is to say (i) that every embedded declarative clause possesses two complementizers, one of which gets obligatorily deleted in contexts without extraction, possibly along the lines suggested by Richards 2010, (ii) that an extracted element goes through a position sandwiched between them, as suggested by the datum in (27), and (iii) that the resuming element is one of the complementizers in its agreeing form just in case the extracted element is a wh-element. Although certainly an attractive idea, it is not tenable either. For it misidentifies the wrong complementizer that has to agree, resulting in a wrong linear order. Consider the relevant intermediate structure where the wh-element appears between the two complementizers.

(28)   **Wen** glaubst du $[_{CP1} [_{C°1}$ dass$] [_{CP2} [_{SpecCP2}$ ~~wen~~$] [_{C°2}$ dass$] [_{IP}$ Maria t liebt $]]]$?
                                        $\downarrow$
       Wen glaubst du $[_{CP1} [_{C°1}$ dass$] [_{CP2} [_{SpecCP2}$ ~~wen~~$] [_{C°2}$ wen$] [_{IP}$ Maria t liebt $]]]$?

In (28), the wh-element appears in the position where the topicalized constituent in (27) appears; there, it agrees with the lower complementizer in CP_2 and gets subsequently deleted. The reason that it agrees with the lower complementizer in

CP$_2$ and not with the higher one in CP$_1$ is that only with this complementizer does the wh-element establish a Spec-Head relation. But then, the agreeing complementizer is the lower one of the two complementizers, and one predicts (29) to be grammatical, contrary to fact.

(29) * **Wen** glaubst du   dass <u>wen</u> Maria t liebt?
          who believe you   that who Maria   loves
          Who do you think Maria loves?

This argument only goes through if one accepts the second assumption I stated above, viz. that the wh-element proceeds through a position *between* the two complementizers. If one rejects this assumption and says that the wh-element goes through a position above the two complementizers, viz. SpecCP$_1$, then the structure would be the one in (30), which results in a grammatical sentence (cf. 31).

(30) **Wen** glaubst du [$_{CP1}$ [$_{SpecCP1}$ ~~wen~~] [$_{C°1}$ dass] [$_{CP2}$ [$_{C°2}$ dass] [$_{IP}$ Maria t liebt]]]?
                                           ↓
      Wen glaubst du [$_{CP1}$ [$_{SpecCP1}$ ~~wen~~] [$_{C°1}$ wen] [$_{CP2}$ [$_{C°2}$ dass] [$_{IP}$ Maria t liebt]]]?

(31) **Wen** glaubst du   <u>wen</u> dass Maria t liebt?
      who believe you   who that Maria   loves
      Who do you think Maria loves?

Unfortunately, this modification is arguably wrong for German. For wh-elements in German always *follow* topicalized elements, both in main and embedded clauses (cf. Grewendorf 2002, p. 238).

(32) a. Den Bänkern, wie kann man denen t heutzutage noch trauen?
            the bankers how can one them   nowadays   still trust
      b.* Wie, den Bänkern kann man denen t heutzutage noch trauen?
            how the bankers can one them   nowadays   still trust
            How can one possibly trust bankers these days?

(33) a. $^?$Ich frage mich, den Bänkern, wie man denen t heutzutage noch trauen kann.
            I   ask   me   the bankers how one them   nowadays   still trust can
      b.* Ich frage mich, wie, den Bänkern man denen t heutzutage noch trauen kann.
            I   ask   me   how the bankers one them   nowadays   still trust can
            I wonder how one can possibly trust bankers these days.

What these sentences show is that topicalized elements always precede wh-elements and that they therefore always appear higher in the structure than wh-elements. But then, the structure in (30) is impossible as a source structure because there the wh-element appears in a position higher than the one dedicated to topicalized elements. This concludes the second argument. In sum, it was shown that the complementizer agreement analysis is impossible to maintain because its fundamental assumptions are incompatible with the data from the previous chapter.

4.3.4 The Resumptive Pronoun Analysis

As its name suggests, the extracted resumptive pronoun analysis treats the resuming element as an extracted resumptive pronoun. What this means is that the extracted element leaves behind a resumptive pronoun at the gap site that itself undergoes extraction to the clause initial position of the embedded clause. This extracted pronoun corresponds to the resuming element. This structure is sketched in (34) [63].

(34)   **Wen**$_i$ glaubst du <u>wen</u>$_k$ sie t$_i$ t$_k$ liebt?
       who   believe you who   she   loves
       Who do you think she loves?

The two traces at the gap site indicate that two extractions took place from there: the first trace 't$_i$' marks extraction of the extracted element proper, and the trace 't$_k$' marks the extraction of the resumptive pronoun left behind. Although this analysis is seemingly compatible with the status of the resuming element as an agreeing free relative proform and its position, it is in general not viable. For it is incompatible with the observation that wh-copying is unbounded, cf. (35).

(35)   **Wen** denkst du <u>wen</u> sie meint <u>wen</u> Harald t liebt?
       who   think you who she means who Harald   loves
       Who do you think she believes Harald loves?

The problem posed by the unboundedness of wh-copying is that one of the two resuming elements in (35) cannot be a fronted resumptive proform because only *one* resumptive proform is permitted for a given extracted element. This is so because resumptive pronouns are overt manifestations of traces left behind by extraction, and extraction leaves behind exactly one trace, and not several ones[64]. Consequently, as the resumptive pronoun analysis mischaracterizes wh-copying in a fundamental aspect, it is impossible to adjust as well.

4.3.5 The Partial Copy Analysis

Similar to the full copy analysis, the partial copy analysis takes the extracted element and the resuming element to be directly related by movement, but differs from the full copy analysis in not analyzing both elements as identical. The non-identity has so far been implemented in two ways, both of which are incompatible with the novel characterization. However, this is not a general defect of the analysis,

---

[63] It is a bit of an irony that McDaniel 1986 coined the term *wh-copying* but never interpreted *copying* the way it is interpreted very often nowadays, viz. as the presence of two identical tokens of one type. Her terminology might appear incoherent in light of her analysis, but she makes implicitly clear (p. 182, 185) that her use of 'copying' is related to the term of 'pronominal copies', coined by Ross (1986, pp. 260-1).

[64] In chapter 6, I argue that this analysis has another crucial defect, viz. that it predicts resuming elements to be sensitive to antipronominal contexts, contrary to fact; cf. section 6.4.2 of chapter 6 for details.

but only of the specific proposals, as I show after having discussed the two proposals.

Under the first proposal (Barbiers et al. 2010), the extracted element is considered a subconstituent of the resuming element, arising from subextraction out of the resuming element. In other words, the extracted element is originally a subpart of the resuming element, as indicated in (36).

(36)   XP = **den**

          X⁰   YP = **wen**
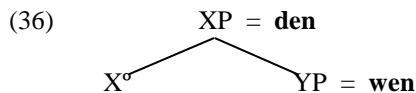
The resulting structure for wh-copying is sketched in (37).

(37)   [$_{YP}$ **Wen**]$_i$ glaubst du [$_{XP}$ <u>den</u> t$_i$]$_k$ Maria t$_k$ liebt?
             who   believe you   who   Maria   loves
        Who do you think Maria loves?

There are two problems with this proposal. The first, rather minor problem has to do with the observation that the status of the resuming element as a proform is independent of the status of the extracted element as a proform. Consider as a concrete example (38).

(38)   **Welchen Mann** glaubst du   <u>den</u> sie t eingeladen hat?
        which   man   believe you who she invited   has
        Which man do you think she has invited?

The structure that this proposal assigned to this sentence is (39).

(39)   [$_{YP}$ **Welchen Mann**]$_i$ glaubst du [$_{XP}$ <u>den</u> t$_i$]$_k$ Maria t$_k$ eingeladen hat?

This requires the following underlying structure for the element undergoing extraction.

(40)   XP = **den**

          X⁰   YP = **welchen Mann**
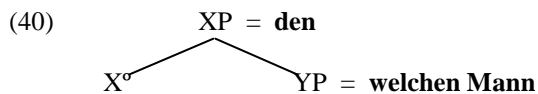
But it strikes me as a rather odd move to analyze an element such as *den* to actually be the realization of an element that contains a full lexical noun[65].

---

[65] Barbiers et al. 2010, pp. 33-7, note this problem and suggest a structure for sentences with complex wh-phrases as extracted elements that differs in fundamental aspects from the structure they adopt for sentences with pronouns as extracted elements. This move is similar to the one by Fanselow & Cavar 2000 who also consider examples with complex wh-phrases to be structurally different. But as I have argued in the previous chapter (cf. section 4.1.1), such a move is not warranted. Moreover, the specific proposal put forward by Barbiers et al. 2010 to cope with complex wh-phrases runs into a number fo problems. They suggest that complex wh-phrases are based generated in their left peripheral position and are inly indirectly connected to the resuming element by some unspecified binding relation. If the binding

The second problem is more serious for the first proposal faces the same problem as the cleft and the complementizer agreement analyses: it cannot account for the agreement restrictions characterizing the resuming element. More specifically, it is at odds with PPs as resuming elements. Consider the version of (36) for PPs in (41).

(41)
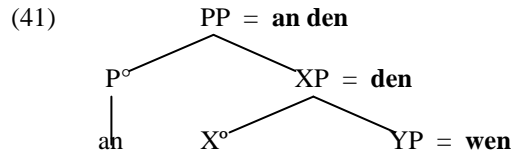
If this element functioned as a resuming element, and if subextraction could target the YP, one would end up with the following sentence, which is ungrammatical even in the liberal variety.

(42) * **Wen** denkst du   an den   sie t einen Brief schreibt?
      who believe you on whom she a   letter writes
      Who do you think she writes a letter to?

The structure of (42) is provided in (43).

(43) $[_{YP}$ **Wen**$]_i$ denkst du $[_{PP}$ an $[_{XP}$ den $t_i]]_k$ sie t_k einen Brief schreibt?

This structure is fully in line with the idea that the extracted element is a subconstituent of the resuming element. And this is precisely the problem because (42) is ungrammatical[66].
The well-formed version corresponding to it is (44).

---

relation is the same as the one in coreference marking, then a complex wh-phrase that is an NP could be able to bind a resuming element that is inside a PP, as this configuration is possible for this kind of binding, cf. (i).

(i) $[_{NP}$ The man$]_i$ thought that Mary wanted to dance $[_{PP}$ with $[_{NP}$ him$]_i]$.

But as I have shown in chapter 3, such a configuration is impossible in wh-copying. If however the same binding relation is involved in wh-copying as in extraction – where the extracted element is said to bind its trace – then two problems arise. First, since an extracted element can only bind a single element, viz. its trace, wh-copying in general is predicted to be impossible (because the extracted element binds two element, its trace and the resuming element). Second, in order to circumvent this problem, one has to analyze the resuming element as a moved trace; but then, the proposal predicts runs into the same problems as the approach that treats the resuming element as a moved resumotive pronoun, for it predicts that wh-copying is restricted to biclausal sentences, whereas in fact it is unrestricted with respect to the number of clauses. Lastly, if the binding relation is the same as the one suggested by Cinque 1990, then wh-copying should be restricted to complex wh-phrases that are NPs, contrary to fact.

[66] Importantly, it is impossible for Barbiers et al. 2010 to explain the ungrammaticality of (42) as being due to an independent factor, viz. that the subextraction of *wen* as shown in (43) targets a PP, which category is an island for extraction in German. For given their analysis, wh-copying with NPs also involves subextraction, but many NPs in German are islands as much as PPs are. For example, indirect objects in German resist subextraction (cf. Sabel 2002, pp. 232-3) but are available in wh-copying. Since subextraction from indirect objects does not violate the relevant island constraint in German, it is unclear why subextraction from PPs would all of the sudden violate it.

(44)   **An wen**   denkst du <u>an den</u>   sie t einen Brief schreibt?
        on whom believe you on whom she a   letter writes
        Who do you think she writes a letter to?

In order to cope with the grammaticality of this sentence, one could adopt the following structure for the relevant PPs.

(45)   PP = **an den**
            P°   XP = **den**
            |
            an   X°   PP = **an wen**
                    P°   YP = **wen**
                    |
                    an
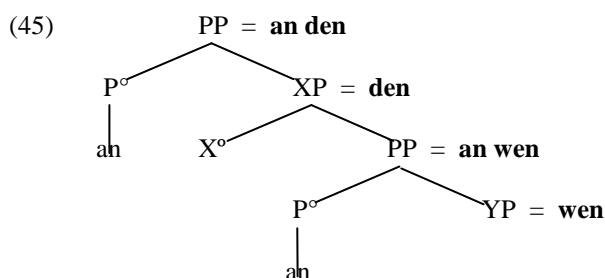
This would provide the tool for the right structure, as indicated in (46).

(46)   [$_{PP}$ **an** [$_{YP}$ **wen**]]$_i$ denkst du [$_{PP}$ an [$_{XP}$ <u>den</u> t$_i$]]$_k$ sie t$_k$ einen Brief schreibt?

But there is a problem. Even if this modification is adopted, then still nothing forces subextraction of only the PP. In other words, the structure in (43) is still compatible with the structure in (45). This might look odd at first sight because if only the YP is subextracted, one would expect the preposition of the PP embedded under XP to surface. In other words, the following structure seems to be expected.

(47)   [$_{YP}$ **Wen**]$_i$ denkst du [$_{PP}$ an [$_{XP}$ <u>den</u> [$_{PP}$ an [t$_i$]]]$_k$ sie t$_k$ einen Brief schreibt?

But this expectation is wrong because the element *den* is the spell out of the whole XP, and not only of the X°-head. In other words, *den* spells out the whole XP, independently of what is contained in it. Therefore, if only the YP is subextracted, the XP remains intact, and it would consequently be spelled out as *den*[67]. In sum, the first proposal is not well suited to deal with wh-copying in German because it is at odds with (i) complex wh-phrases as extracted elements and (ii) PPs as resuming elements.

The second proposal, adopted by Felser 2004 and Pankau 2009 exploits the idea that extraction is feature driven. More precisely, extraction of an element has as a consequence that unvalued features on that element get valued; the value is provided by the head to which the element is moved. This idea is sketched in (48).

(48)   a. **Wen** glaubst du <u>wen</u> Maria t liebt?
            who believe you who Maria   loves
            Who do you think Maria loves?
        b. [$_{CP1}$ **wen**$_{[Op: wh]}$ glaubst du [$_{CP2}$ <u>wen</u>$_{[Op:\_]}$ Maria t liebt]]

---

[67] This claim too strikes me as implausible, similar to the one that *den* can contain a complex wh-phrase.

The main intuition shared by both Felser 2004 and Pankau 2009 is that although the extracted element and the resuming element are copies of each other, their feature specification is different, because of the different positions the copies occupy. The highest copy has its wh-feature valued, whereas all other copies don't. The reason for this difference is that only the highest copy occupies the target position of extraction, and only there can the relevant feature be valued. The different feature specifications are consequently responsible for the difference between the extracted element and the resuming element, viz. that the former is a wh-phrase, whereas the latter is not. The two versions of this proposal only differ with respect to the precise analysis of the resuming element: Felser 2004 analyzes it as an indefinite proform, whereas Pankau 2009 analyzes it as some sort of operator-proform, that is, a proform that is permitted in extraction contexts only. Independent of that difference, both versions face the same problem: neither of them can account for the fact that the resuming element is always a proform, irrespective of whether or not the extracted element is a proform as well. The reason for this is fairly simple: if the resuming element is simply a wh-phrase lacking a valued wh-feature, then one would expect complex wh-phrases to permit phrases corresponding to them but without a wh-feature. But this is not the case.

(49)   a.* **Welchen Mann** glaubst du   <u>den Mann</u> sie t eingeladen hat?
            which   man   believe you the man   she invited   has
        b.* **Welchen Mann** glaubst du   <u>diesen Mann</u> sie t eingeladen hat?
            which   man   believe you this   man   she invited   has
            Which man do you think she has invited?
        c.* **Was für einen Mann** glaubst du   <u>einen Mann</u> sie t eingeladen hat?
            what for a   man   believe you a   man   she invited   has
            What man do you think she has invited?

As the ungrammaticality of (49) shows, both definite (49a & 49b) and indefinite (49c) complex resuming elements are excluded. Similar to the full copy analyses, this defect is unfixable: that only proforms are permitted as resuming elements can only be accounted for by assuming that only proforms are possible as extracted elements, which is however not the case.

4.4   The Adjusted Partial Copy Analysis and its Problems

What I have shown so far is that the specific proposals formulated within the partial copy analysis are unworkable. However, in contrast to all other analyses, this analysis is certainly adjustable to deal with the properties of the resuming element and the agreement restrictions to which it is subject to. For one could easily modify this analysis and set up a proposal according to which the resuming element is after all a partial copy of the extracted element, and not a subconstituent of the extracted

element or a partially valued version of the extracted element, but rather a *partially spelled out* version of the extracted element. More specifically, the resuming element can either be analyzed as a *minimal* spell out of the extracted element, where 'minimal' means 'all features that are specified in functional heads', or as an element that results from *deleting* all features that are not specified in functional heads. Consider how this idea could pave the way for a treatment of the properties of the resuming element. First, that only proforms are permitted can be argued to be due to the fact that lexical nouns are not part of the functional domain of the extracted element, and can therefore not be spelled out. And since on the other hand it is precisely proforms that lack lexical nouns, the appearance of proforms is not unexpected. Second, the agreement properties of the resuming element receive a straightforward treatment because such features have been argued to be specified in functional heads. This is true for φ-features, case features and prepositions. Φ-features are either licensed within a single functional projection AgrP/φP (Dechaine & Wiltschko 2002) or are distributed among separate projections for number (Ritter 1991) and gender (Picallo 1991); case is licensed within the functional projection K(ase)P (starting with Lamontagne & Travis 1986); finally, prepositions either constitute the separate projection PP, which is part of the extended nominal domain (Grimshaw 2000), or they are elements also appearing in KP (Caha 2009). Therefore, analyzing the resuming element as a reduced version of the extracted looks rather promising. Nevertheless, I do not adopt such an analysis either in this work because although initially attractive, this adjustment leads to a rather odd analysis of the resuming element. For the properties of the resuming element must eventually be treated as *accidental* properties.

First, the basic idea that defines the adjustment is that the resuming element is the extracted element minus all lexical features. Or alternatively, the resuming element is the spell out of all the functional features specified in the extracted element. But this basic idea is too simple. Although every feature of the resuming element is also a feature of the extracted element specified in some functional projection within the extracted element, the reverse does clearly not hold. For not every feature of the extracted element specified in some functional projection of the extracted element is also a feature of the resuming element. Consider which-type complex wh-phrases.

(50)   **Welchen Mann** glaubst du   <u>wen</u> sie t liebt?
         which   man   believe you who she loves
         Which man do you think she loves?

The difficulty one faces with sentences of this type is that the resuming element *wen* is only a *subset* of the features specified in the functional projections of the extracted element. For what is also specified there is d-linking. Irrespective of where precisely d-linking is located, this feature is certainly part of the functional make up of the extracted element (Alexiadou et al. 2007). Nevertheless, it must not be retained in the resuming element, cf. (51).

(51) * **Welchen Mann** glaubst du   <u>welchen</u> sie t liebt?
         which   man   believe you which   she loves
         Which man do you think she loves?

The problem is not restricted to this type of complex wh-phrases, but carries over to all other complex wh-phrases, as illustrated in the contrasts in (52)-(54).

(52) a. **Was für einen Mann** glaubst du   <u>wen</u> sie t eingeladen hat?
         what for a   man   believe you who she invited has
     b.* **Was für einen Mann** glaubst du   <u>was für einen</u>/<u>so einen</u> sie t eingeladen hat?
         what for a   man   believe you what for a   so a   she invited   has
         What man do you think she has invited?

(53) a. **Wem seinen Freund** glaubst du   <u>wen</u> sie t eingeladen hat?
         who his   friend   believe you who she invited has
     b.* **Wem seinen Freund** glaubst du   <u>wem seinen</u>/<u>dem seinen</u> sie t eingeladen hat?
         who his   friend   believe you who his   who his   she invited   has
         Whose friend do you think she has invited?

(54) a. **Wen von den Männern** glaubst du   <u>wen</u> sie t liebt?
         who of the men   believe you who she loves
     b.* **Wen von den Männern** glaubst du   <u>wen von denen</u>/<u>den von denen</u> sie t liebt?
         who of the men   believe you who of them   who of them she   loves
         Which of the men do you think she loves?

All the ungrammatical sentences have in common that they contain as a resuming element the extracted element minus all lexically specified features, that is, they contain as a resuming element a version of the extracted element in which only the features specified in functional projections are spelled out. And although this is fully in line with the adjusted analysis, the resulting resuming elements nevertheless induce ungrammaticality. Obviously, the adjusted analysis needs fine tuning: it is not sufficient that functional features *in general* are retained, but that only those are retained that correspond to a *proform*. This would, for example, include all projections for φ-features, but not the projections encoding notions such as d-linking. This certainly looks like a minor technical problem, but there is a bigger one looming behind it. The bigger problem is that if only a subset of functional projections is spelled out, why does this subset contain the functional projections it does contain? In other words, what motivates that the only projections retained are those corresponding to a proform but not other projections, for example the one encoding d-linking? Interpretability of the relevant features to be retained is not at stake because d-linking is an interpretable feature on nominals, similar to φ-features. Valuation of the features that need to be retained is not at stake either because d-linking and the φ-features are all inherent features of the complex wh-phrases, and therefore need no valuation. Therefore, one is left wondering why the resuming element doesn't show the reverse pattern of retention: φ-features are not spelled out, whereas d-linking is spelled out. In sum, the problem is that nothing motivates the retention of only those features of the extracted element that correspond to a proform, as summarized in (55).

(55) *The Proform Problem*
     Why are the only features of the extracted element retained on the resuming element those that correspond to a proform?

This problem might find an easy solution because the resuming element is a specific type of proform, viz. a free relative proform. As shown, free relative proforms include elements that have no interrogative force, viz. d-proforms. In addition, even wh-proforms that function as free relative proforms have arguably no interrogative force because free relative clauses cannot be questioned.

(56) a. Du   solltest nehmen [wen sie   dir   empfehlen].
          you should take   who they you recommend
          You should hire who they recommend to you.
     b.* [Wen sie   dir   empfehlen] solltest du   nehmen t?
          who they you recommend should you take
          Who is such that they recommend him to you and that you should take him?

In order to maintain the idea that the resuming element is a partial spell out of the extracted element, one has to assure that the [+wh]-feature of the extracted element is ignored for spell out. Fortunately, this requirement could suggest a solution to the proform problem. Under the assumption that d-linking and interrogativity are specified on D°, one might suggest that what is retained on the resuming element are only the functional projections between D° and N°, that is, a *contiguous sequence* of functional projections. As these correspond to φ-features, and since proforms are usually analyzed as nothing but a collection of φ-features, this solution might solve both the problem why only proforms are permitted as resuming elements and why the resuming element has to agree with the extracted element in φ-features: the resuming element is nothing but the spell-out of the φ-features of the extracted element. In order to arrive at a free relative proform, one might argue that D° on the resuming element is equipped with a default value resulting in a free relative proform. The resulting analysis is illustrated in (57).

(57)   [$_{DP}$ D°[$_{AgrP}$ Agr°[$_{NP}$ N°]]] → [$_{DP}$ D°[$_{AgrP}$ Agr° [$_{NP}$ N°]]]
          welch- en   Mann   w-   en   Mann
          wessen Ø   Mann   w-   en   Mann

Although this solution in terms of contiguity combined with deletion of the noun phrase plus an underspecified D° is attractive at first sight, it cannot be upheld. There are in total two problems with this solution, one minor and one not. The minor problem is that the analysis embodies the claim that the resuming element is a reduced version of the determiner of the complex wh-phrase; in particular, the resuming element is a spell-out of the φ-features specified on D°. But I argued in the previous chapter that agreement for φ-features is controlled by the noun of the complex wh-phrases, and not by its determiner, as the data in (58) reveal.

(58) a. **Wessen Mann**   glaubst du <u>wen</u>   sie t eingeladen hat?
          whose   man.MASC.SG believe you who.MASC.SG she invited   has
          Whose husband do you think she has invited?
     b. **Wessen Frau**   glaubst du <u>die</u>   er t eingeladen hat?
          whose   woman.FEM.SG believe you who.FEM.SG   he invited   has
          Whose woman do you think he has invited?

c. **Wessen Kind** glaubst du <u>das</u> sie t abgeholt hat?
whose child.NEUT.SG believe you what.NEUT.SG she picked.up has
Whose child do you think she has picked up?

As these examples show, the shape of the possessive wh-determiner *wessen* is fixed, indicating that it doesn't bear φ-features, similar to *whose*. Despite this absence of φ-features on the determiner of the extracted element, the resuming element agrees with it. This strongly indicates that what the resuming element agrees with is the head noun of the extracted element, and not the determiner. However, this state of affairs cannot be expressed in this analysis because the resuming element is a spell-out of the φ-features of *wessen*, but *wessen* doesn't bear any φ-features. The partial analysis is sketched in (59).

(59) $[_{DP} D°[_{AgrP} Agr°[_{NP} N°]]] \rightarrow [_{DP} D°[_{AgrP} Agr° [_{NP} N°]]]$
wessen – Mann w- – Mann

Irrespective of what this analysis predicts as the phonological exponent of the resulting element in (59), what it does not predict is that the resulting form agrees with the element on the left hand side of the arrow in (59). As I said, this is only a minor problem because one can easily suggest that *wessen* bears unexpressed φ-features that get expressed as soon as the D° hosting *wessen* is replaced by a default version of D°, so that the correct analysis of (58a) is the one in (60).

(59) $[_{DP} D°[_{AgrP} Agr°[_{NP} N°]]] \rightarrow [_{DP} D°[_{AgrP} Agr° [_{NP} N°]]]$
wessen en Mann w- en Mann

Although I am not aware of any arguments in favor of the idea that *wessen* contains unexpressed φ-features, I am not aware of any evidence against it either. Therefore, the problem is only a minor one. The second problem is a real one, though. The resuming element does not only agree in φ-features with the extracted element but also in *case*; in addition, if both the extracted element and the resuming element are PPs, then they have to contain the *same preposition*. The problem posed by this observation for the analysis in terms of contiguity is that φ-features, and case and preposition are not contiguous because of the intervention of D°. This illustrated in (62) for the example in (61), with KP corresponding to the projection encoding case.

(61) **Mit welchem Mann** glaubst du <u>mit dem</u> er t tanzt?
with which man believe you with whom he dances
Which man do you think he dances with?

(62) $[_{PP} P° [_{KP} K°[_{DP} D°[_{AgrP} Agr° [_{NP} N°]]]]] \rightarrow [_{PP} P° [_{KP} K°[_{DP} D°[_{AgrP} Agr° [_{NP} N°]]]]]$
mit -m welch- -e- Mann mit -m w- -e- Mann

Therefore, since the projections specifying the features that need to be retained in the resuming element are scattered within the extracted element, contiguity is of no

help. This problem is aggravated by the observation that adverbs also are permitted as resuming elements, cf. (63).

(63) **Wo**   glaubst du <u>wo</u>   sie   sich t getroffen haben?
      where believe you where they SELF   met   have
      Where do you think that they met?

The problem posed by adverbs is that they do not contain φ-features, are not specified for case, and do not retain prepositions, even when connected to a PP as an extracted element, as shown in (64).

(64) **In welchem Haus** glaubst du   <u>wo</u>   er t wohnt?
      in which   house believe you where he lives
      In which house do you think he lives?

These sentences show that the idea of simply retaining all features between N° and D° is too simplistic. Not only are features sometimes retained that are specified above D°, sometimes none of the relevant features are retained, even though when available for retention, as in (64). But similar to the proform problem, nothing internal to the adjusted partial copy analysis provides a reason why such features need to be retained as well, let alone under which conditions. This problem is summarized in (65).

(65) *The More-Than-Agreement-Features Problem*
      Why can the projections encoding case and preposition be retained on the resuming element and under what conditions?

The final problem is even more serious than the two previous problems because it concerns the very idea behind this analysis. For what this analysis cannot account for is why the copy corresponding to the resuming element is spelled out only partially *in the first place*. That is, why is the copy not *fully* spelled out? The problem is stated in (66).

(66) *The Motivation Problem*
      What motivates the partial spell out?

All three problems in conjunction illustrate the serious defect of the adjusted partial copy analysis, viz. that the properties of the resuming element must be treated as *accidental* properties. First, that the resuming element differs from the extracted element is an accidental property because nothing motivates the partial spell out in the first place. Second, it is an accidental property that the resuming element is a proform because nothing motivates that the partial spell out affects only those features corresponding a proform. Finally, it is an accidental property that the resuming element can retain the case and preposition of the extracted element, but need not.
In sum, in order to correctly describe the properties of the resuming element, the adjusted analysis treating it as a partial spell out of the extracted element eventually

has to rely on arbitrary choices with respect to the question (i) why are all features not retained in the resuming element, (ii) why do the features that are retained in the resuming element correspond to proforms, and (iii) under what conditions can features other than those corresponding to a proform be retained.

4.5 Summary and Outlook

I have argued in this chapter that the properties of the resuming element uncovered in the previous chapter have rather unwelcome consequences for previous approaches to wh-copying. First, the previous characterizations of the resuming element are incompatible with these properties. Second, most analyses in which the previous characterizations are embedded are not amenable to a successful modification resulting in compatibility with the properties of the resuming element. And the one analysis that is amenable to such a modification is so only at the price of eventually leading to an account in which the properties of the resuming element are accidental.

Despite these overall negative results, the remainder of this thesis is devoted to the more positive aim of showing that a satisfactory analysis of the properties of the resuming element, that is, an analysis in which the properties of the resuming element turn out as non-accidental, is nevertheless achievable. What is required for such an analysis is however the adoption of another framework, viz. *Arc Pair Grammar* (Johnson & Postal 1980; Postal 2010). As I consider this framework to be unknown to possibly all readers, the next chapter gives a brief overview of this framework's main characteristics. The remaining chapters illustrate that the tools of Arc Pair Grammar allow the formulation of an analysis for the resuming element in which all its properties follow without an appeal to arbitrary mechanisms.

Chapter 5

The Arc Pair Grammar Framework

5.1   Introduction

I have argued in the previous chapter that previous accounts of wh-copying are insufficient in two ways. First, they provide wrong characterizations of the resuming element, that is, of the element underlined in (1).

(1)   **Wen** glaubst du <u>wen</u> sie liebt?
        who   believe you who she loves
        Who do you think she loves?

The suggestions range from characterizing it as an interrogative element, an indefinite proform, a relative proform, a wh-pronoun, a complementizer, or as an element that is identical to the extracted element (set in bold in (1)) except for lacking the [+wh]-feature of the extracted element. But as argued in chapter 3, the resuming element is in fact an agreeing free relative proform. Second, the majority of analyses from which these characterizations follow cannot be adjusted in such a way as to account for the characterization of the resuming element as an agreeing free relative proform. The only analysis that can achieve this, viz. the analysis of the resuming element as a partially spelled out copy of the extracted element, can do so only for the price of treating the properties of the resuming element as accidental. But it was also already hinted at in the end of the previous chapter that an analysis for the resuming element is achievable in which the properties follow as non-accidental properties if such an analysis is formulated within a specific framework, viz. the Arc Pair Grammar framework. Since I suppose that this framework is largely unfamiliar to most readers, this chapter gives both a brief overview of the basic assumptions characterizing Arc Pair Grammar and introduces the tools relevant for my analysis[1].

---

[1] I will not undertake the task of presenting all ideas characterizing the APG framework. For a more detailed presentation of APG, I refer to Johnson & Postal 1980, Postal 1986, and Postal 2010. Furthermore, for sake of brevity, some notions are only informally defined (head, tail) or not defined at all (R-Graph); their formal definitions can be found in the appendix.

The chapter is organized as follows. I first introduce the concept of arc in section 2, and discuss in more detail the format and some important properties of arcs in section 3. In section 4, I turn to two important relations holding between arcs, viz. Sponsor and Erase, introduce three important metarelations in section 5, and discuss the concepts R-graph, S-Graph, and L-graph in section 6. Section 7 highlights some important theoretical features of APG, and section 8 provides a brief summary.

5.2   Grammatical Relations as Arcs

Arc Pair Grammar (henceforth *APG*) is in many respects a successor of Relational Grammar, henceforth *RG*, (cf. Perlmutter 1983; Perlmutter & Rosen 1984, Postal & Joseph 1990 for an overview of the theoretical ideas and advantages of this framework), developed by David Johnson and Paul Postal in the late sevenies, and first presented in 1980 (cf. Johnson & Postal 1980). As with any other framework, Arc Pair Grammar has undergone some changes in the course of the time, one effect of which was that its name changed to 'Metagraph Grammar' (cf. Postal 1992, 2010). I refrain from using this term here and stick to 'Arc Pair Grammar' because most of the work carried out within that framework (Aissen 1987; Dyla 1981; Kubinski 1987; Postal 1982 et seq.) refers to it as 'Arc Pair Grammar'.

APG (just as its predecessor RG) considers grammatical relations such as subject, object, and indirect object (to name just a few) theoretical *primitives*, that is, entities undefinable in terms of other primitives of a theory, such as dominance or precedence relations. The formal encoding of grammatical relations in APG is achieved via enriching constituent structure trees with labels on the edges. That is, not only nodes, but also the edges connecting two nodes are labeled. In other words, instead of trees with naked edges (cf. 2), APG employs tree-like structures with labeled edges[2] (cf. 3).

(2) and (3) tree diagrams

---
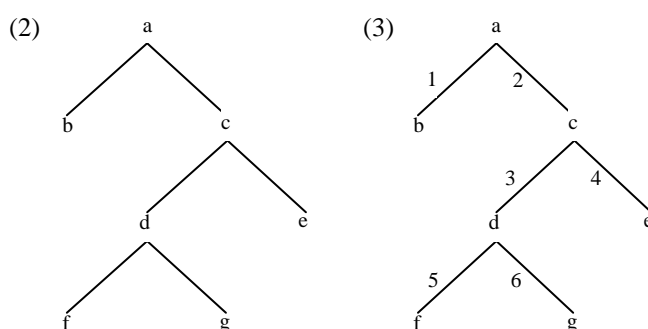
[2] The idea of taking grammatical relations as theoretical primitives is shared by other frameworks such as Dependency Grammar (Melčuk 1988), Functional Grammar (Dik 1981), and Lexical Functional Grammar (Bresnan 2001, Dalrymple 2001). APG differs from the latter two by implementing grammatical functions via labeled edges, from Dependency Grammar by recognizing constituency, and from all others by allowing the possibility that an element can bear more than one grammatical relation.

The label on an edge expresses the grammatical relation an element bears. Indicating grammatical relations via labeled edges is a far from arbitrary notation. Since edges connect nodes, it conveys that grammatical relations like 'subject' are *binary* relations, that is, relations holding between two elements, viz. between the constituents defined by the two nodes connected via an edge. For example, the structure in (3) not only expresses that the constituent defined by node b bears the grammatical relation 1; it also expresses that it bears this grammatical relation *to* some other node, viz. to node a. To make this abstract discussion a bit more precise, consider the simplified structure for the sentence *John loved Mary* in (4)[3].

(4)
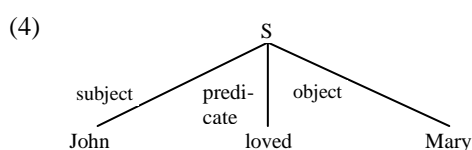
What is expressed in this structure is therefore not only that the nominal constituent *John* is a subject and that the nominal constituent *Mary* is an object, it is also expressed that both are subject and object, respectively, in relation *to* something, viz. to the constituent defined by node 'S', i.e. in relation to the whole clause[4]. Left unrepresented so far is that grammatical relations are *asymmetric*, that is, the nominal constituent *John* is the subject of the sentential constituent defined by, and not vice versa. In order to express this, the labeled edge is taken to be a directed egde; the structure eventually looks as in (5).

(5)
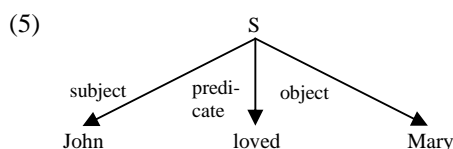
It is linguistically convenient to refer to something as being the grammatical relation linking two elements without necessarily specifying what these two elements are or what the grammatical relation is. Technically this means that one would like to refer to a labeled edge plus its labeled nodes independently of what the labels on either the nodes or the edge are; all that matters is that some pairing of two nodes and

---

[3] The structure is simplified insofar as I ignore two details in the analysis of clauses in general. First, the internal structure of the words in example 4 is unexpressed, for example that the predicate *loved* consists of the verb stem *love* plus a tense morpheme indicating past. I return to this issue at least partly in section 5 of chapter 6, although I focus on the internal structure nominal constituents only, since only these are of relevance for the topic of this thesis. Second, no VP- or IP-like constituents are represented in this structure. I deliberately ignore this issue in general in the remainder of the thesis because VPs are of no importance for my analysis (although I consider an analysis of VPs and IPs in terms of separate clauses (cf. McCawley 1998, ch. 8) as most promising; in such a view, the distributional differences between clauses and subclausal constituents can easily be accounted by recognizing different types of predicate arcs (cf. Postal 2010, p. 148)). Finally, APG does not require binary branching structures only.
[4] For this reason, it is not enough to simply add a subject-feature or a label like 'SubjP' (cf. Poletto 2000) to the node representing *John* because this would fail to convey precisely the relational character of the notion subject (cf. also the discussion in Chomsky 1965, pp. 69-70, on this issue).

some labeled edge is present. The relevant notion allowing this is the notion of an *arc*, informally defined in (6)[5].

(6)   An *arc* is a triple of two labeled nodes a and b and a labeled edge c such that the labeled edge c connects the labeled nodes a and b

Graphically, an arc has the following form[6].

(7)   a

        GR$_x$

               b
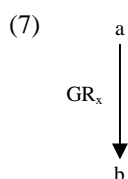
The representation in (7) is to be read as follows.

(8)   Node b bears the grammatical relation GR$_x$ to node a.

Arcs are the basic tool used for the formulation of well-formedness conditions on sentences within APG, which also partially explains the name of the framework. All these conditions make reference to specific properties of one or more arcs and restrict the combinations in which they are allowed to appear together within a structure. In order to make these conditions work, I now introduce some terminology that allows one to talk about the way arcs are related to each other.

5.3   The format of arcs

5.3.1   Nodes

Consider again the general format of an arc as given in (7), repeated in (9).

(9)   a

        GR$_x$

               b

---
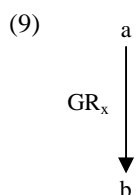
[5] The definition differs from the one in Johnson & Postal 1980, p. 36. There it was assumed that an arc is actually a quadruple, additionally containing a set of coordinates as a member of the quadruple. The usefulness of this concept is rather doubtful and was consequently dismissed in later APG analyses.
[6] In this representation in, *GR$_x$* is a variable over members of the set of edge labels which indicate grammatical relations, and the letters are variables over the set of node labels. I specify in section 3 what elements constitute the set of node labels and what elements constitute the set of edge labels.

The node appearing at the tail of an arc is called the *tail node*, whereas the node appearing at the head of the arc is called the *head node*. The set of nodes belonging to an arc are called the arc's *endpoints*, any member of the set is called *endpoint*. In (9), **a** and **b** are the arc's endpoints, with **a** being the tail node and **b** the head node. With the help of the notion *endpoints*, a number of useful relations can be defined. First, one can define the relation holding between the tail and the head node, which is called *govern*[7] in APG, and whose informal definition is given in (10)[8].

(10)   A node **a** *governs* a node **b** iff there is an arc A such that **a** is the tail node of
         A and **b** is the head node of A

So in (9), node **a** governs node **b**, both of which are the arc's endpoints. Second, it is possible to define relations between arcs based on whether or not the arcs share endpoints. These relations are *attached*, *disjoint*, *overlap*, *neighbor*, *parallel*, *colimb*, *kiss*, *branch*, *support*, and *loop*; they are given informal definitions in (11) and are illustrated in (12).

(11)   a. Two arcs A and B are *attached* iff A and B share at least one endpoint
         b. Two arcs A and B are *disjoint* iff A and B are not attached
         c. Two arcs A and B *overlap* iff A and B have the same head node
         d. Two arcs A and B are *neighbors* iff A and B have the same tail node
         e. Two arcs A and B are *parallel* iff A and B overlap and are neighbors
         f. Two arcs A and B are *colimbs* iff A and B are neighbors and do not overlap
         g. Two arcs A and B *kiss* iff A and B overlap and are not neighbors
         h. Arc A is a *branch* of Arc B (alternatively, arc B is a *support* of arc A) iff
             the tail node of A is the head node of B
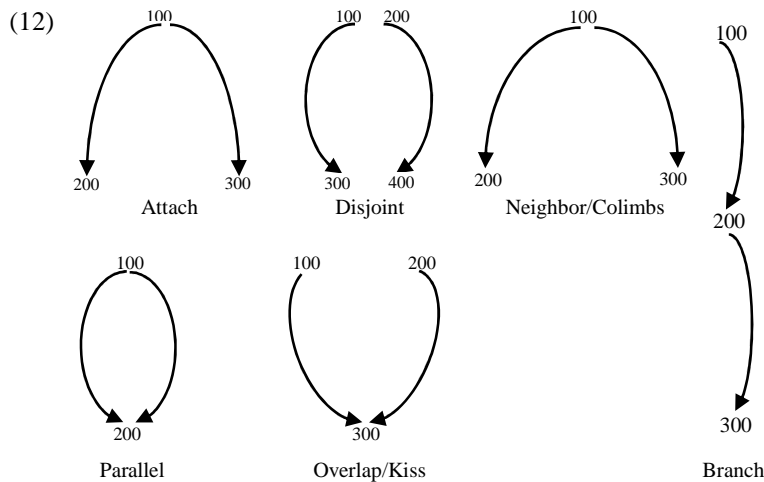
(12)   Attach   Disjoint   Neighbor/Colimbs   Parallel   Overlap/Kiss   Branch

---

All these relations are needed at some point or other for the analysis developed in this thesis, although only five occur frequently, viz. *Overlap*, *Parallel*, *Neighbor*, *Colimb*, and *Branch/Support*. Before I turn in more detail to overlapping and parallel arcs, a general remark on the notation used throughout this chapter. It is cumbersome to have sentences such as 'two arcs A and B overlap/are parallel/ etc' appearing in well-formedness conditions. Therefore, I abbreviate the relevant relations by a single word and put the arguments of this relation in brackets to the right of the abbreviation. Overlapping arcs are then written as in (13a), parallel arcs as in (13b), branching arcs as in (13c), etc.

(13)   a. Overlap (A,B)
        b. Parallel (A,B)
        c. Branch (A,B)

The most interesting and maybe also unusual aspect of the definitions in (11) is that they mention two relations between arcs in a structure that are usually explicitly forbidden in most frameworks based on phrase structure trees, viz. overlapping[9] and parallel arcs. Both of them, however, play a fundamental role in the representation of the structure of sentences, as shown in (14) and (15)[10].

Homer I think likes beer.   *John dies.*

---
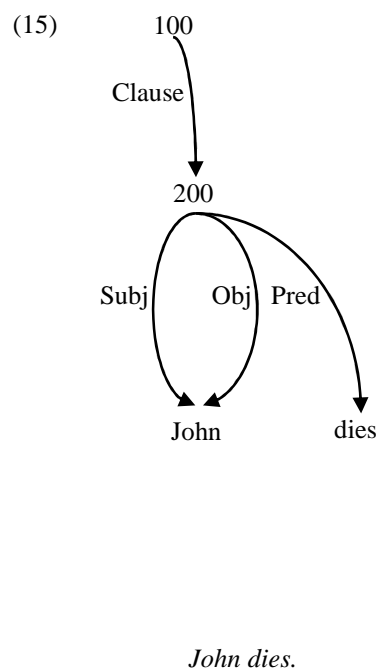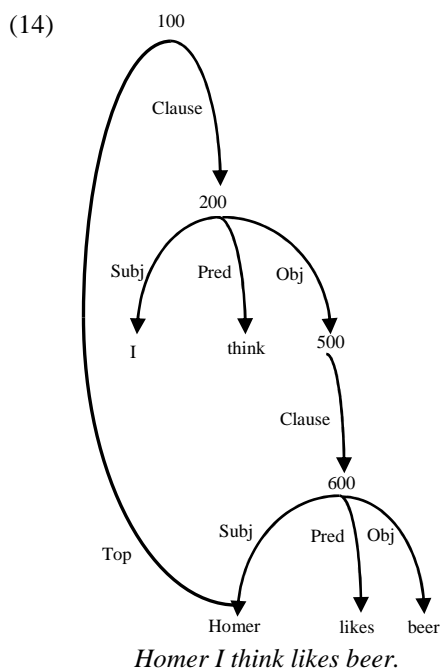
[9] As the usage of the word *usually* makes clear, the equivalent of overlapping arcs in frameworks based on phrase structure have appeared in the work of a number of syntacticians, viz., *multidominance structures*, for example in the work by McCawley 1982, Gärtner 2002, and Citko 2011.
[10] The use of '?' in these and other structures to follow indicates the suppression of edge labels that have not been introduced so far.

Overlapping arcs figure prominently in the analysis of extraction, as shown in the simplified[11] topicalization structure in (14), where *Homer* is not only the object of the embedded clause, but is also an element that has undergone extraction, in this case topicalization. The double role played by *Homer* in this sentence is dealt with by letting it be the head of two arcs. That the relevant arcs are not neighbors is a consequence of the fact that the two relations are established with respect to different elements (the whole sentence for the extraction relation, the embedded clause for the direct object relation). Parallel arcs are mostly employed in the analysis of what is sometimes called grammatical function-changing operations. An example is given in (15) for the simplified structure of the sentence *John dies*, containing an unaccusative verb. The verb *die* is an unaccusative predicate, which means that its surface subject is an underlying object (cf. Perlmutter 1978, Perlmutter & Zaenen 1984). The double role played by *John* is again expressed by letting it head two arcs, one representing the direct object, the other the subject relation. That these arcs are also neighbors (and therefore parallel) is due to the fact that the two relations are established clause internally[12]. In sum, overlapping and parallel arcs are the tools employed in APG to capture (inter alia[13]) what is captured by movement in Generative Grammar[14].

---

[11] I argue in chapter 6, section 5, that extractions – such as topicalization – are characterized in a much more complex way than indicated here. I have nevertheless chosen this highly simplified version because it is easier to get a feeling for the idea guiding the analysis for extraction with such a rudimentary structure.

[12] Analyzing *die* as an unaccusative predicate is suggested by the observation that it does not permit pseudopassives (cf. i), contrary to unergative predicates like *play* (cf. ii).

(i) *This bed was died in t by George Washington.

(ii) This three-room dollhouse was played in t by the present owner when she was a child.

The ungrammaticality of (i) is not due to extraction out of an adjunct because both unaccusative and unergative predicates allow extraction out of adjuncts not involving previous raisings to subject.

(iii) a.   Which country did Jesus die in t?
       b.   Which film did Sigourney Weaver and Goldie Hawn play in t?

The different behavior of unaccusative and unergative predicates is usually handled via the 1-Advancement Exclusive Law in RG and APG (Perlmutter & Postal 1984).

[13] Overlapping and parallel arcs are also used in the analysis of coreference, cf. chapter 6, section 6.

[14] The free relative clause in this sentence is inserted on purpose: overlapping and parallel arcs are not the tool to deal with movement, they are the tools to deal with those aspects of sentence structure for which Generative Grammar uses movement. Consequently, these tools are not notational variants of movement, just like movement is not a notational variant for overlapping and parallel arcs. Both are distinct theoretical proposals to capture certain phenomena of the syntax of natural languages. I should also mention that no extra complications are introduced into the definitions specifying structures with overlapping and parallel arcs. To the contrary, the trees usually employed by Generative Grammar exclude such configurations only by appeal to an additional axiom, viz. the Single Mother Condition (Sampson 1975) or equivalents thereof (for example the Nontangling Condition in Partee et al. 1993, pp. 442-4). One should also bear in mind that the motivation for the adoption of the Single Mother Condition (or the Nontangling Condition) was not a linguistic one. It was due to the fact that it wasn't trees themselves that were the proper object of investigation in the beginning of Generative Grammar but *derivations* (that is, stringsets). Trees mainly served an illustrational purpose. Due to limitations on admissible derivations, trees with overlapping or parallel arcs could not arise, similar to crossing lines, which are explicitly forbidden too in Generative Grammar. For a more detailed discussion on this aspect, cf. McCawley 1968, 1982, 1998.

5.3.2   The Labeling of Nodes

I have so far used only variables for the labels of both head and tail nodes but have not specified what the set of node labels actually is. The APG assumption is that this set is divided into two disjoint subsets, the set of *terminal node labels* and the set of *non-terminal node labels*. Elements from the former subset can only appear on terminal nodes, elements from the latter set can only appear on non-terminal nodes. A terminal node is a node that does not govern other nodes, whereas non-terminal nodes are those that do govern other nodes. This is formally expressed in (16) and (17).

(16)   Def.: *Terminal Node*
       Terminal Node (a) ↔ ¬∃b Govern (a,b)

(17)   Def.: *Non-Terminal Node*
       Non-Terminal Node (a) ↔ ∃b Govern (a,b)

The set of node labels for non-terminal nodes is assumed to consist of the set of natural numbers starting from *100*[15]. The modified versions for (14) and (15) with node labels on non-terminal nodes are given in (18) and (19).

(18)

Homer I think likes beer.

(19)

John dies.

---
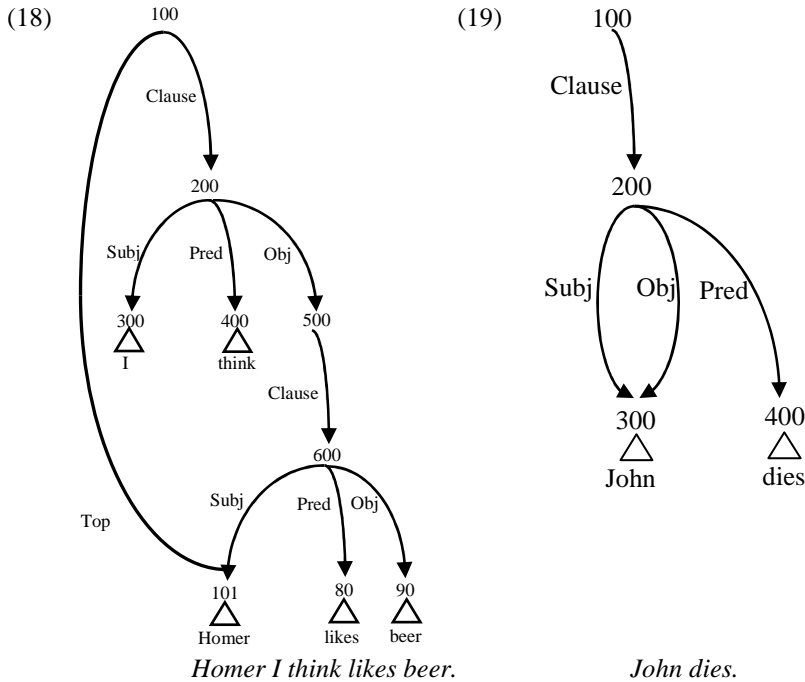
[15] From a theoretical point of view, this choice is completely arbitrary. From a practical point of view, it is needed because the numbers up to *100* are employed for the labeling of edges.

Before I turn to an explication of the structures, the structures literally no longer contain terminal elements, in contrast to the structures in (18) and (19). What has changed is that the former terminal nodes where words appeared are now analyzed as non-terminal nodes. This change is of course rooted in the fact that words do have an internal structure; I return to this issue in chapter 6, section 5. As it is inconvenient to always specify this internal structure, I use the standard notation abbreviating unexpressed structure, viz. the triangle. The notation employing integers as labels for non-terminal nodes has its roots in the analysis of linearization which I only briefly sketch here. In a nutshell, linear precedence is reduced to the 'less than' relation holding between integers, of which natural numbers form a subset. The order of constituents is then read off a structure by simply ordering the head nodes of *neighboring* arcs[16] according to the 'less than' relation. For example, in the structure in (18), since the Subj-arc's head node's integer is less than the one of the Obj-arc, the former precedes the latter. Word order regularities are captured by language specific constraints that restrict the licit numbering of head nodes between neighboring arcs. In English, for example, every arc that is a neighbor of a subject arc must be headed by a node that is greater than the node heading the subject arc, and every direct object arc that is a neighbor of a predicate arc must be headed by a node that is greater than the node heading the predicate arc; these two conditions coupled together account for the strict subject-predicate-object order in English simple declarative clauses.

The set of node labels for terminal nodes is divided into three disjoint proper subsets, viz. into the set of *phonological* node labels, the set of *logical* node labels, and the set of *grammatical* node labels. As the names of these sets suggest, members of the first set represent the realization, members of the second set the lexical meaning, and members of the last set grammatical properties of elements. I specify members of the first set by phonological representations, members of the second set by words in capital letters, and members of the last set by the abbreviations usually employed, for example *masc* for *masculine*, *III* for *third person*. I illustrate this aspect in more detail in chapter 6, section 5, where I deal with the analysis of the internal structures of constituents.

5.3.3   The Labeling of Edges

GR_x is a variable over members of the set of edge labels. The members of this set are called *relational signs* (henceforth, R-signs) and they are nothing but abbreviations for grammatical relations. Crucially, the set of R-signs not only includes elements indicating the traditional grammatical relations *subject*, *object*, *indirect object*, and *predicate*, it also includes R-signs indicating aspects of sentence structure that were either not recognized as distinct grammatical relations in traditional grammar or which are generally not considered grammatical relations at all. Concerning the first class, APG assumes a much finer-grained distinction of the traditional object

---

[16] More correctly, of neighboring surface arcs, cf. section 5.

relation. More specifically, relations such as *chômeur*, *subobject*, *semiobject*, and *quasi object* are assumed. As for the second class, APG uses R-signs to indicate all kinds of adverbials such as *location*, *instrument*, *comitative*, *directional*, *benefactive* etc. R-signs are also invoked to deal with notions connected to extraction such as *topicalization*, *wh-question extraction*, *focus movement*, *right dislocation* etc. Whereas it is possible to grasp the intended interpretation of the second class of arcs (like *instrument*, or *topicalization*), this does not hold for the first class (like *chômeur* or *semiobject*). Since my analysis mainly involves examples containing the traditional grammatical relations, adverbial grammatical relations, or extraction relations, I will not justify the additional object relations of the first class, although I return to a number of differences between subobjects and direct objects in chapter 6[17]. Some important grammatical relations and their R-signs are given in (20).

(20)   Subject   =   1
        Direct Object   =   2
        Indirect Object =   3
        Subobject   =   4
        Predicate   =   P
        Clause   =   Cl
        Topicalization   =   Top
        Wh-Question   =   WH

The sentences in (18) and (19) are given in their further modified version in (21) and (22) which incorporate the abbreviations from (18).

Homer I think likes beer.

John dies.

---
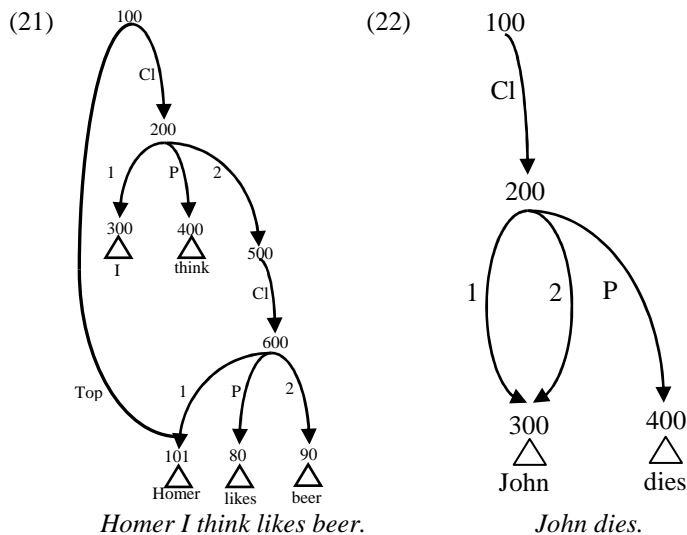
[17] For the subobject and semiobject relation, cf. Postal 1990 for French, and Postal 2010 for English. For the quasi object relation in French, cf. Postal 1995. The chômeur relation is inherited from earlier work in Relation Grammar (cf. Perlmutter 1983) but has undergone some changes (Johnson & Postal 1980, chap. 8, and especially Postal 1986).

Although each relation is formally distinct from the other qua R-sign, the set of R-signs is not unstructured. To the contrary, I adopt the assumption from earlier RG and APG work (Perlmutter & Postal 1983, p. 86; Johnson & Postal 1980, p. 198) that the set of R-signs is structured into subsets. I deviate however from the specific division proposed earlier, and assume the following division.

(23)

```
                                   R-Signs
                       _____|_____
                      |                                 |
                  Structural                        Non-
                   |     |                         Structural
                   |    Overlie                    ___|___
                   |    /     \                   |       |
                   |  Trigger Overlay            POS     Non-
                 Basic  /|     /    \           /|||\    POS
                  /|  INT FOC Proper- Pseudo-  N A V Prt Cl  __|__
                 / |   ...    Overlay Overlay              |     |
                /  |          /|       |                MORPH  LABEL
               /   |        WH RR ...  30               /  \    /   \
              /    |                               Stem  Agr    Non-
        Argumental Non-                                   |     CORE
          /|     Argumental                             CORE   /    \
         / |      /|||\                                 /  \   Ps Num Gen
        /  |     D F U P MOD                           L   PH
     Object Pseudo-
      /|    Object
     / |      |
    /  |      60
 Central Oblique
  /|\    /  |  \
 1 2 3 ... Loc Temp ...
```
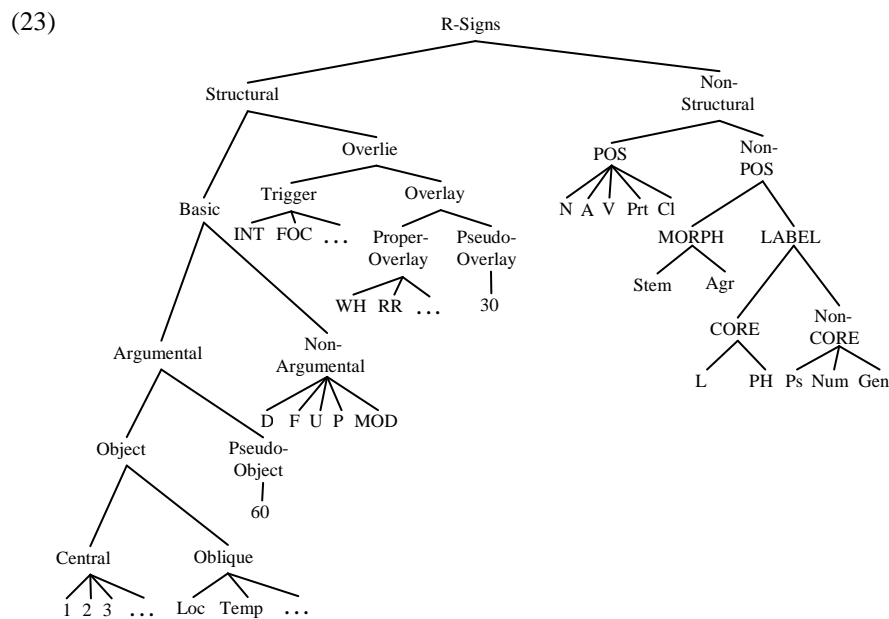
I briefly comment on this division, starting from the top. R-signs are divided into *Structural* and *Non-Structural* R-signs. The set of Structural R-signs contains all relations that are relevant for the description of clausal and non-clausal constituents, whereas the set of Non-structural R-signs is needed for the descriptions of the internal structure of these constituents. I first give a brief overview of the Structural R-signs, and then turn to the Non-Structural R-signs.

The set of structural R-signs is subdivided into *Overlie* and *Basic* R-signs. The set of Overlie R-signs consists of all arcs relevant for extraction. This set is further subdivided into two mutually disjoint sets, viz. *Trigger* and *Overlay* R-signs. The set of Trigger R-signs represents semantic aspects of extraction, like *interrogativity*, *topicality*, and very likely also quantificational properties. The set of Overlay R-signs contains all relations having to do with the formal aspects of extraction, like the directionality of extraction and possibly also whether or not it is sensitive to antipronominal contexts (cf. Postal 1994a, 1998). The set of Overlay R-signs is again divided into two mutually disjoint subsets. The first one is the one of *Proper-Overlay* R-signs, the other one the set of *Pseudo-Overlay* R-signs. The set of Pseudo-Overlay R-signs contains the relation representing the intermediate relation created in extraction contexts; the set of Proper-Overlay R-signs contains all the rest, that is, all the relations representing the type of extraction, like wh-question

extraction, left dislocation, etc. Returning to the second member of the set of Structural R-signs, the set of Basic R-signs contains all relations that are needed to specify properties of basic clauses, that is, clauses not involving extractions. Basic R-signs are further divided into *Argumental* and *Non-Argumental* R-signs. The set of Non-Argumental R-signs consists of all relations that as the name suggests cannot function as arguments in basic clauses. This set consists of five members, *F*, *D*, *P*, *U*, and *Mod*. 'F' is the relation for flags, that is, elements that indicate the presence of some primary relation; I return in great detail to flags in chapter 6, section 6. 'D' represents the determiner relation, comprising elements that – as the name of the relation suggests – determine the status of a referent in a given context. One should bear in mind that 'D' is a cover term for a set of relations, comprising for example *Definite*, *Indefinite*, *Specific* etc. 'P' and 'U' are both predicate relations, where P represents the predicate relation for plain predicates in basic clauses and U the predicate relation possibly[18] needed for the description of clause union structures, called 'restructuring' in generative grammar; cf. Aissen & Perlmutter 1983 for a general outline of clause union structures. Finally, 'Mod' is the relation I assume for modifiers inside nominal constituents. Similar to 'D', 'Mod' is actually an abbreviation for a number of different modifying relations, like *shape*, *color*, etc. As modifiers are of no real relevance for the discussion of wh-copying, I simply use the label 'Mod' when structures containing modifiers are provided; one should keep in mind though that this is actually a name for a set of relations. The set of Argumental R-signs on the other hand contains all relations that are relevant for the description of arguments inside a basic clause. This set is further subdivided into *Object* and *Pseudo-Object* R-signs. The set of Pseudo-Object R-signs contains only a single relation called *60* to which I return in the section on flagging in the next chapter. In contrast to the set of Pseudo-Object R-signs, the set of Object R-signs contains all relations that constituents of basic clauses can bear. This set too is divided into two subsets, viz. *Central* and *Oblique* R-signs[19]. The set of Central R-signs comprises inter alia the subject, direct object, indirect object, and subobject relation; these relations are central in so far as if a clause contains any arguments at all, then it necessarily contains one of them[20]. The set of Oblique R-sign*s* comprises all adverbial relations, like *location*, *instrument*, *comitative*, *directional*, *benefactive*.

I now turn to the set of Non-Structural R-signs. As already mentioned, the set of Non-Structural R-signs deals with all aspects of structure internal to constituents. This set divides into two disjoint sets, viz. *POS* R-signs and *Non-POS* R-signs. 'POS' abbreviates part of speech. I assume five parts of speech: 'N' for *noun*, 'A' for *adjective*, 'V' for *verbs*, 'Prt' for *particles*, and 'Cl' for *clause*[21,22]. I remain silent

---

[18] The existence of a distinct clause union relation has been questioned by Davies & Rosen 1988; whether or not this relation exists is again of absolutely no relevance for my analysis, and I just mention it for completeness.

[19] This distinction is of course not specific to APG: Generative Grammar distinguishes *arguments* from *adjuncts*, HPSG makes a difference between *complements* and *non-complements* of a verb, and Dependency Grammar has at its very foundation the distinction between *actants* and *circonstants* (Tesnière 1959).

[20] The class of Central RS is definitely further subdivided (cf. Postal 2010, p. 72) but since this is irrelevant for my analysis, I ignore this.

[21] The system is very close to the one proposed by Jespersen in his works (cf. for example Jespersen 1933, chapter 8)

here as to whether this division is universal or not, and whether certain ones of them can actually be fused into a single relation[23]; it only reflects what is needed at least in German (and many other Indo-European languages). Next, the set of Non-POS R-signs contains relations that specify properties of parts of speech. This set is divided into two disjoint sets, viz. *MORPH* R-signs, abbreviating 'morphological', and *LABEL* R-signs. The set of MORPH R-signs consists of two elements, viz. *Stem* and *AGR*. 'Stem' is the relation that contains all semantic and phonological properties of a word. 'Agr' on the other hand contains all purely formal properties of a word, that is, properties that have no direct bearing on its interpretation[24]. The set of LABEL R-signs is divided into two sets, *CORE* and *Non-CORE* R-signs. Label R-signs have the function to specify information that is required by MORPH R-signs. In other words, arcs with LABEL R-signs appear as branches of arcs labeled by MORPH R-signs, and only of these. For this reason, the set of LABEL R-signs is also divided into two sets. The set of CORE R-signs contains two members, *L* and *PH*, specifying the semantic and phonological properties required by the Stem arc. More specifically, 'L' – abbreviating *logical* – specifies semantic information, whereas 'PH' – abbreviating *phonological* – specifies phonological information of a word. The set of Non-CORE R-signs specifies all the purely functional parts of a word. Therefore, they always appear under 'Agr' and comprise at least three members, viz. *Ps*, *Num*, and *Gen*. 'Ps' – abbreviating *person* – specifies person, 'Num' -

---

[22] This list deliberately excludes adpositions and adverbs as a part of speech, both of which I analyze as *particles*. Regarding adpositions, I argue in chapter 6, section 6 that they are best treated similar to case affixes, and that what distinguishes them is whether they can occur free or must occur bound. Concerning adverbs, the definition of this word class mixes two aspects that in my view should be kept separate, viz. whether or not the shape of an element is subject to variation and the relation of this element in a clause. Accordingly, I treat adverbs as particles, whose shape is fixed, that are heads of arcs bearing one of the many adverbial relations. Although clauses seem a weird part of speech at first sight, their inclusion is not problematic because clauses certainly are parts of speeches; they differ from the other ones however in allowing structural RS-arcs as branches (in fact, they require them).

[23] For example, maybe adjectives and nouns can be fused; I don't assume this however because only adjectives are gradable (that is, only adjectives can form comparatives and superlatives). I should also stress that any system of parts of speech is to a certain extent arbitrary because it is unclear which differences are relevant for distinguishing them (cf. Rauh 2010). Again, a serious investigation of this aspect of natural language structure is beyond the scope of this work. As a rule of thumb, I follow a purely morphological classification of parts of speech. Nouns, verbs, and adjectives differ from particles in that their shape is not fixed, whereas the shape of particles is fixed. They differ from each other with respect to the features that are responsible for the shape variance: adjectives are gradable, nouns and verbs are not; nouns are case marked, verbs are not. Clauses differ from all other elements in that they internally permit structural arcs (cf. chapter 6, section 5).

[24] It is well-known that the distribution of person, number, and gender features need not coincide with the semantic properties of the element specified for these features. Concerning gender features, their distribution is both arbitrary and does not always reflect the sex of the referent. Regarding their arbitrariness, the German word for table has masculine gender, whereas the French one has feminine gender. As for the mismatch between gender and sex, the German word *Weib* (Engl. woman) has neuter gender, whereas women in real word are feminine. Similar remarks apply for number features. Their distribution is sometimes arbitrary (*trousers* are plural in English, but *Hose* is singular in German) and does not always coincide with semantic properties of the element (for example, the word *Netherlands* is marked with a plural although it refers to a single administrative entity). That the formal marking for person features does not always coincide with semantic marking for person has recently been shown by Collins & Postal 2012.

abbreviating *number* – specifies number, and 'Gen' - abbreviating *gender* – specifies noun class[25].

All these R-signs and their subsets can be defined in a more formal way as below.

(24) a. $X \in$ RS $\leftrightarrow$ X $\in$ Structural RS $\lor$ X $\in$ Non-Structural RS
      b. X $\in$ Structural RS $\leftrightarrow$ X $\in$ Basic RS $\lor$ X $\in$ Overlie RS
      c. X $\in$ Overlie RS $\leftrightarrow$ X $\in$ Trigger RS $\lor$ Overlay RS
      d. X $\in$ Overlay RS $\leftrightarrow$ X $\in$ Proper-Overlay RS $\lor$ Pseudo-Overlay RS
      e. X $\in$ Pseudo-Overlay RS $\leftrightarrow$ X $\in \{30\}$
      f. X $\in$ Proper-Overlay RS $\leftrightarrow$ X $\in \{$WH, LD, RD …$\}$
      g. X $\in$ Trigger RS $\leftrightarrow$ X $\in \{$Int, Top, Foc …$\}$
      h. X $\in$ Basic RS $\leftrightarrow$ X $\in$ Argument RS $\lor$ X $\in$ Non-Argument RS
      i. X $\in$ Non-Argument RS $\leftrightarrow$ X $\in \{$F, D, P, U, Mod$\}$
      j. X $\in$ Argument RS $\leftrightarrow$ X $\in$ Object RS $\lor$ X $\in$ Pseudo-Object RS
      k. X $\in$ Pseudo-Object RS $\leftrightarrow$ X $\in \{60\}$
      l. X $\in$ Object RS $\leftrightarrow$ X $\in$ Central RS $\lor$ X $\in$ Oblique RS
      m. X $\in$ Oblique RS $\leftrightarrow$ X $\in \{$Loc, Instr, Com, Dir, Ben …$\}$
      n. X $\in$ Central RS $\leftrightarrow$ X $\in \{$1, 2, 3, 4, 5, 6, 8$\}$
      o. X $\in$ Non-Structural RS $\leftrightarrow$ X $\in$ POS RS $\lor$ X $\in$ NON-POS RS
      p. X $\in$ NON-POS RS $\leftrightarrow$ X $\in$ MORPH RS $\lor$ X $\in$ LABEL RS
      q. X $\in$ LABEL RS $\leftrightarrow$ X $\in$ CORE RS $\lor$ X $\in$ Non-CORE RS
      r. X $\in$ Non-CORE RS $\leftrightarrow$ X $\in \{$Ps, Num, Gen$\}$
      s. X $\in$ CORE RS $\leftrightarrow$ X $\in \{$L, PH$\}$
      t. X $\in$ MORPH RS $\leftrightarrow$ X $\in \{$Stem, AGR$\}$
      u. X $\in$ POS RS $\leftrightarrow$ X $\in \{$N, A, V, Prt, Cl$\}$

In order to refer to an arc whose label belongs to any of these subsets, the following definition is necessary[26].

(25)   X-Arc (A) $\leftrightarrow$ GR_x-Arc (A) $\land$ $GR_x \in X$[27]

This definition mentions the term GR_x-arc, whose informal definition is (26)[28].

(26)   An arc A is a *GR_x-Arc* iff the edge of A is labeled GR_x[29]

---

[25] This list is presumable subject to language variation and would include for example 'Hon', for *honorific*, in languages such as Japanese.
[26] Cf. Johnson & Postal 1980, p. 40.
[27] I adopt here the convention of suppressing all universal quantifiers having widest scope in a definition. In other words, the correct formulation of the definition in (29) would look as follows:
(i) $\forall A \forall X$ (X-Arc (A) $\leftrightarrow$ GR_x-Arc (A) $\land$ $GR_x \in X$)
[28] Cf. Johnson & Postal 1980, p. 40.
[29] Postal 2010, p. 14, adopts an assumption of Johnson & Moss 1995, for whom GR_x is actually a variable over *tuples* consisting of members of the set of R-signs. In other words, labels are not atomic but complex. However, as the discussion in Johnson & Moss 1995 (especially p. 44) makes clear, Sponsor and Erase (cf. section 4) become partly superfluous under this view. Postal 2010 on the other hand assumes both complex labels (called *quace*) and Sponsor and Erase, which in my view represents the

As before, this are abbreviated as GR_x-arc (A). With the definition in (25), it is possible to refer to arcs like Object RS-arcs, Overlay RS-arcs etc., which is of big help in the formulation of many conditions. The definition in (26) is already useful in itself because it allows talking about the label of the edge of an arc without specifying the nodes to which the arc belongs. In addition, it allows one to define yet another useful concept, viz. one that relates two arcs from a given structure whose corresponding edges bear the same label. This relation is called *equivalence* and informally defined in (27)[30].

(27)   Two arcs A and B are *equivalent* iff A is a GR_x-Arc and B is a GR_y-Arc and $GR_x = GR_y$

In line with the convention established above, this is abbreviated as Equivalent (A,B).

5.4   Sponsor, Erase, and Successors

The assumptions presented so far are very close to those of RG. What distinguishes APG from RG is that APG additionally assumes two *primitive* relations holding between arcs, viz. *Sponsor* and *Erase*. These relations define a *pairing* of two arcs. Importantly, this pairing is *independent* of both the edges and the nodes of these arcs. For this reason, they are primitive: they are irreducible both to properties of the endpoints of the arcs involved and to the arcs' labels. Conditions restricting these pairings play the most prominent role in the formulation of well-formedness conditions on sentences. Due to this prominence, the framework is not only called *Arc* Grammar (which would be a suitable alternative name for Relational Grammar) but *Arc **Pair*** Grammar.

Sponsor and Erase – like any other relation – are abbreviated as Sponsor (A,B) and Erase (A,B), respectively. The intuitive meaning of 'A sponsors B' is that the grammatical relation borne by the head of B in a structure is dependent on the presence of the grammatical relation borne by the head of A in the same structure. In a nutshell, A could not exist without B. More technically, if an arc A sponsors another arc B then A is a necessary condition for the presence of B. The intuitive meaning of 'A erases B' is that the non-presence of the grammatical relation borne by the head B depends on the existence of the grammatical relation borne by the head of A. (I return in section 6 to what is meant by non-presence, but for now, it is enough to understand it as 'not overtly realized'.) More succinctly, B does not exist because A does. Again more technically, if an arc A erases another arc B then the presence of A is a sufficient condition for the non-presence of B. What is embodied

---

worst case scenario due to its inherent redundancy. I therefore deviate from Postal 2010. Moreover, as Sponsor and Erase figure rather prominently in my analysis, I stick to the conservative position of having atomic edge labels only while retaining Sponsor and Erase.

[30] This relation was called *Same Sign* in Johnson & Postal 1980, p. 40.

by the recognition of both Sponsor and Erase is the claim that for a given sentence some grammatical relations depend on the existence (or non-existence) of some other grammatical relations. Sponsor and Erase, both of which are binary, are represented in the following way.

(28)   (29)

Sponsor   Erase
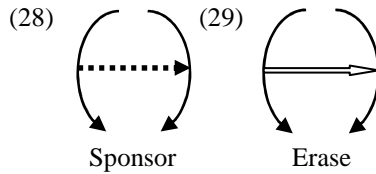
Having established these two relations, all basic aspects for the understanding of an APG-structure for sentences are covered. In (30) and (31), the full structures for the sentences in (21) and (22) are given.

(30)   (31)

Homer I think likes beer.   *John dies.*
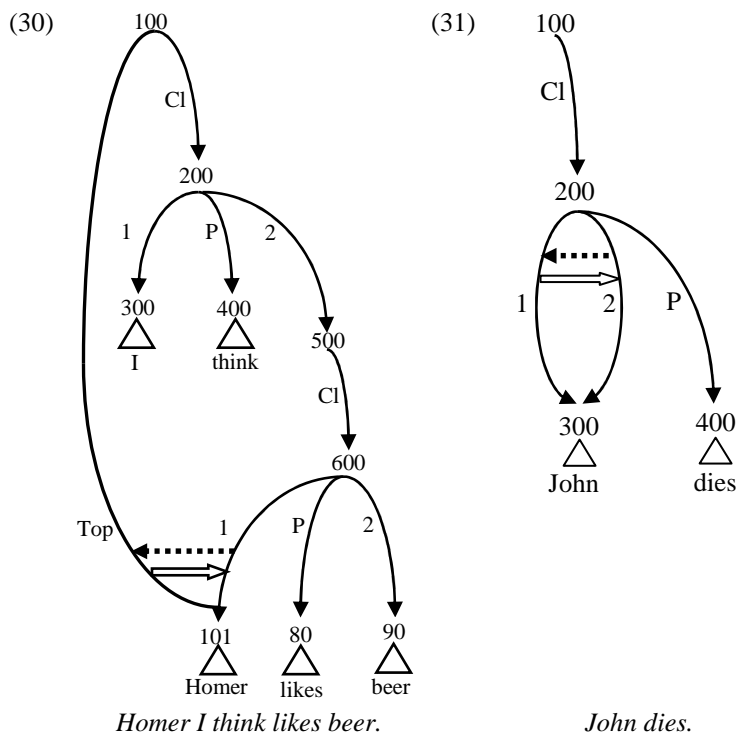
Consider the structure in (30). The 1-arc of the embedded clause sponsors the Top-arc indicating that the subject of the embedded clause is topicalized. This sponsor relationship follows from the interpretation of the Sponsor relation according to which the sponsored arc depends on the sponsoring arc. Since extractions target only elements that already bear another grammatical relation, the Top-arc can only be sponsored by the 1-arc, and not vice versa. A similar kind of reasoning applies to the

erasure relationship between the two: the presence of the Top-arc is a sufficient condition for the non-presence of some other arc, in this case the 1-arc. This line of reasoning extends to (31): the existence of a 1-arc in clauses with an unaccusative predicate is dependent on the existence of a 2-arc; and that only the 1-arc is finally present is a sufficient condition for the 2-arc to be non-present.

The pair (1-arc, Top-arc) in (30) and the pair (1-arc, 2-arc) in (31) not only illustrate Sponsor, they illustrate a specific kind of sponsorship which plays such a prominent role in the APG framework that it is given a specific name, viz. *Successor* or *Predecessor*. They are defined in (32)[31].

(32)   Def.: *Successor/Predecessor*
        Successor (A,B) / Predecessor (B,A) ↔ Sponsor (B,A) ∧ Overlap (A,B)

That is, all arcs sponsored by an overlapping arc are successors, and the arcs sponsoring an overlapping arc are predecessors. Successors and predecessors come in three types. In the first type, A sponsors B and B erases A; in the second case, A sponsors B and A erases B; in the third case, A sponsors B and neither of them erases the other. These three types are called *Successor-I*, *Successor-II*, and *Successor-III*, respectively, or alternatively *Predecessor-I*, *Predecessor-II*, and *Predecessor-III*. The definitions for each type are given in (33) and illustrated in (34)[32].

(33)   a. Def.: *Successor-I/Predecessor-I*
            Successor-I (A,B) / Predecessor-I (B,A) ↔ Successor (A,B) ∧ Erase (A,B)
        b. Def.: *Successor-II/Predecessor-II*
            Successor-II (A,B) / Predecessor-II (B,A) ↔ Successor (A,B) ∧ Erase (B,A)
        a. Def.: *Successor-III/Predecessor-III*
            Successor-III (A,B) / Predecessor-III (B,A) ↔ Successor (A,B) ∧ ¬ (Erase (A,B) ∨ Erase (B,A))

(34) a.   b.   c.

         Successor-I   Successor-II   Successor-III
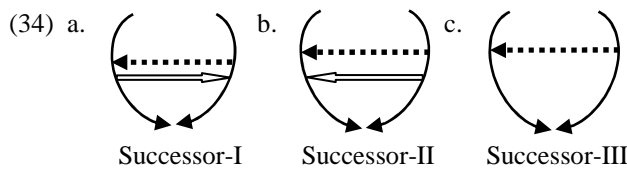
As the structures in (34) make sufficiently clear, successors-I are used to represent what in Generative Grammar is called *overt* movement, whereas successors-II are used to represent what is called *covert* movement in Generative Grammar. An example of what is called overt movement has of course been illustrated in (30). Covert movement would not differ greatly from this structure, except for the

---

[31] Cf. Postal 2010, p. 31.
[32] In the 1980 version of APG, only successors-I were allowed, which assumption was later given up on empirical grounds in Postal 1990 and Postal 1992; successors-II were referred to as *phantom successors* in that work. The definitions are taken from Postal 2010, p. 31.

direction of erasure: the overlay arc would not only be sponsored by some arc but it would also be erased by the very same arc.

In case an arc is sponsored by a non-overlapping arc, that is, if an arc is sponsored but not a successor, then this arc is called a *Graft*. Its formal definition is (35).

(35)   Def.: *Graft*
        Graft (A) ↔ ∃B (Sponsor (B,A) ∧ ¬Overlap (A,B))

Informally speaking, grafts are the opposite of successors: successor require sponsorship by an overlapping arc, grafts disallow it.

Both Sponsor and Erase are tightly constrained. First, no arc is sponsored or erased by more than one arc. Second, both Sponsor and Erase are irreflexive relations, that is, no arc can sponsor or erase itself. Third, both Sponsor and Erase are asymmetric[33]. Formally, these conditions are expressed as follows.

(36)   a.   *The Sponsor Uniqueness Law*
              Sponsor (A,B) ∧ Sponsor (C,B) → A = C
        b.   *The Erase Uniqueness Law*
              Erase (A,B) ∧ Erase (C,B) → A = C

(37)   a.   *The Sponsor Irreflexivity Law*
              Sponsor (A,B) → A ≠ B
        b.   *The Erase Irreflexivity Law*
              Erase (A,B) → A ≠ B

(38)   a.   *The Sponsor Asymmetry Law*
              Sponsor (A,B) → ¬(Sponsor (B,A)
        b.   *The Erase Asymmetry Law*
              Erase (A,B) → ¬(Erase (B,A)

These conditions exclude the following Sponsor and Erase pairs.

(39) a.   (40) a.   (41) a.
     [= 36a]   [= 37a]   [= 38a]

     b.   b.   b.
     [= 36b]   [= 37b]   [= 38b]

---
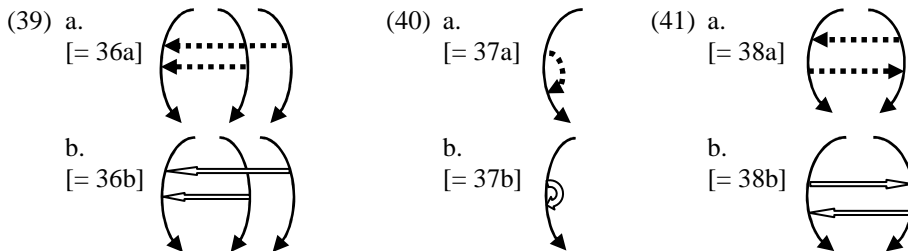
[33] Both Sponsor and Erase are also intransitive relations but this follows as a theorem from the uniqueness condition imposed on them, which subsumes transitivity as a special case. Assume to the contrary that Sponsor is transitive. Then the following would hold:

(i)   Sponsor (A,B) ∧ Sponsor (B,C) → Sponsor (A,C).

But this would mean that C is sponsored by two arcs, viz. A and B, thereby violating the uniqueness condition on the Sponsor relation. The argument carries over in the same way to Erase.

5.5   Local, Foreign, and Ancestral

It is extremely useful to distinguish binary relations between arcs that establish the relevant relation between neighboring arcs from those that establish it between non-neighboring arcs. To achieve this, two non-primitive relations can be defined, one of which is called *local*, and the other one *foreign*. Their definition is given in (42)[34].

(42)   For any binary relation R holding between two arcs
        a. *L(ocally)-R* (A,B) ↔ R (A,B) ∧ Neighbor (A,B)
        b. *F(oreign)-R* (A,B) ↔ R (A,B) ∧ ¬Neighbor (A,B)

For example, if L-Successor (A,B) then A and B not only overlap but are also neighbors, that is, parallel arcs. And if F-Successor (A,B) then A and B overlap but are not neighbors. The difference between local and foreign successors is present in the structures illustrated so far. Consider again the structures for the two sentences I have been dealing with so far, repeated in (43) and (44).

Homer I think likes beer.   *John dies.*
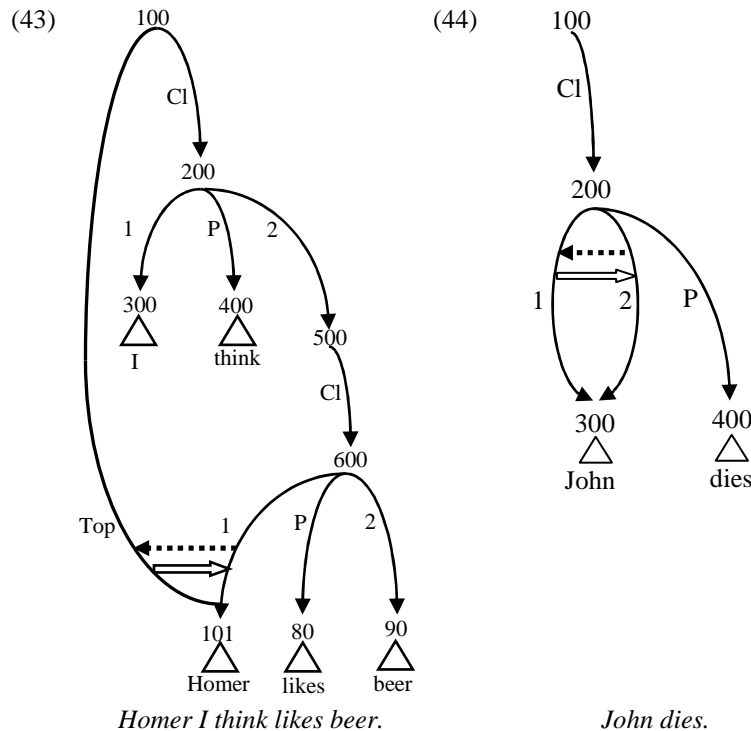
In (43), the Top-arc is a foreign successor of the 1-arc in the embedded clause because they only overlap (they share the same head node, viz. the 101-node) but are

---

[34] Cf. Postal 2010, p. 32.

not neighbors because they have different tail nodes (the Top-arc has the 100-node as its tail node, the 1-arc has the 600-node as its tail node). In (44), on the other hand, the 1-arc is a local successor of the 2-arc because both arcs share head and tail node, viz. the 300-node as their head node, and the 200-node as their tail node. These two metarelations *local* and *foreign* are not restricted to successors, but apply to any relation. For example, whereas the Top-arc in (43) F-erases the 1-arc, the 1-arc in (44) L-erases the 2-arc.

A relatively important law employing the local relation is the one in (45).

(45)   *The L-Successor Non-Equivalence Law*[35]
        L-Successor (A,B) → ¬Equivalent (A,B)

This law excludes all structures in which an arc sponsors another arc that bears the same label, which it overlaps, and which is a neighbor, that is, all structures containing a sequence of equivalent L-successors. Informally speaking, the law precludes for example that a subject advances internal to its clause to subject, followed by another subject advancement etc. The linguistic relevance of such a law should be obvious: it excludes structures containing vacuous structures.

The final important notion I would like to explicate is the *ancestral relation*, which shows up in many places of my analysis. Like the other two relations Local and Foreign, the ancestral relation is a binary relation that itself is defined over another binary relation R. The ancestral is the reflexive, transitive closure of a relation. A well-known example of it is the difference between dominance and immediate dominance: the former is the reflexive, transitive closure of the latter. It is rather difficult to define this relation in an elegant way, so I only provide a disjunctive definition. Before doing so, I first provide a definition of transitive closure.

(46)   Given some binary relation R, (x,y) is in R^+ iff (i) or (ii)
        (i) (x,y) is in R
        (ii) $\exists z_i, \ldots, z_n, n > i+1 > 0, \forall i \ (z_i, z_{i+1})$ in R, (x, z_1) is in R and (z_n, y) is in R

The ancestral relation is then defined as in (47).

(47)   Given any binary relation R, (x,y) is in R(emote)-R iff (i) or (ii)
        (i) $x = y$
        (ii) (x,y) is in R^+

As a concrete application of the ancestral, consider the structures in (48) and (49).

---

[35] Cf. Postal 2010, p. 91.

(48)   (49)
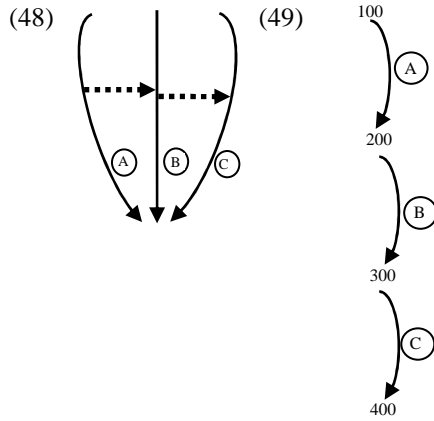
The structure in (48) contains two successor pairs of, viz. Successor (B,A) and Successor (C,B). Given the definition of successor, C is *not* a successor of A because C is not sponsored by A. However, C *is* the R-successor of A because C is related to B the same way as B is related to A, viz. by the successor relation, thereby satisfying the definition for R-successor. In addition, every arc in (48) is the R-successor of itself because the definition of the ancestral allows reflexive pairing. I mention this explicitly because the successor relation does *not* allow reflexive pairing. This need not be stated as a separate condition because it follows from Sponsor Irreflexivity. Assume to the contrary that an arc were the successor of itself; then it would sponsor itself, violating the irreflexivity condition imposed on the Sponsor relation. The structure in (49) contains two Branch pairs; viz. Branch (B,A) and Branch (C,B). Parallel to (48), C in (49) is not a branch of A because C's tail node is not the A's head node, but C is an R-Branch of A because C's tail node is the head node of an arc, viz. B, whose tail node is the head node of A. Furthermore, every arc is an R-Branch of itself whereas no arc can be its own Branch due to the No Loop Law (cf. 54 below). I should stress at this point that the ancestral is defined for *any* binary relation, not only for binary relations between arcs. Consider again the structure in (49): the node labeled 100 governs the node labeled 200 but not the node labeled 300 because 100 and 300 are not nodes of the same arc. However, node 100 *R-governs* node 300 because node 100 governs a node that itself governs node 300, viz. node 200.

5.6   R-Graphs, S-Graphs, and L-Graphs

The formal object comprising arcs and the relations between them is called *metagraph* in APG. A metagraph is a set of arcs connected via Sponsor and Erase. Apart from this very general characterization, a metagraph has to satisfy a number of laws in order to be well-formed. The most important ones are the Root Law and the No Circuit Law. The Root Law is given in (50).

(50)   *The Root Law*
        Metagraph (X) → ∃a (Node-Extractable (a,X) ∧ ∀b ((Node-Extractable (b,X)) R-Govern (a,b)))

This law requires that there is one, and only one, node that R-governs all other nodes of a given metagraph X. The definition for Node-Extractable is provided in (51).

(51)   Def.: *Node-Extractable*
        Node-Extractable (a,X) ↔ ∃A (A ∈ X ∧ Endpoint (a,A))

According to this definition, a node is node-extractable from a metagraph if this metagraph contains an arc A such that a is a node from A, that is, either its head or its tail node. The node picked out by the Root Law can be defined as follows.

(52)   Def.: *Root*
        Root (a,X) ↔ Node-Extractable (a,X) ∧ ∀b ((Node-Extractable (b,X)) R-Govern (a,b))

A trivial consequence of the Root Law is that no metagraph can contain dangling arcs, that is, arcs that are not R-attached to all other arcs. For assume to the contrary that such arcs existed; then the nodes of the arcs would not be R-governed by the root, thereby violating the Root Law. The No Circuit Law is given in (53).

(53)   *The No Circuit Law*
        Metagraph (X) → ¬∃A (A ∈ X ∧ Circuit (A))

A circuit is defined as follows, and excludes structures such as the ones in (55).

(54)   Def.: *Circuit*
        Circuit (A$_1$, … A$_n$) ↔ Branch (A$_1$, A$_n$) ∧ ∀i ∈ N*, i < n (Branch (A$_{i+1}$, A$_i$))

(55) a.   b.
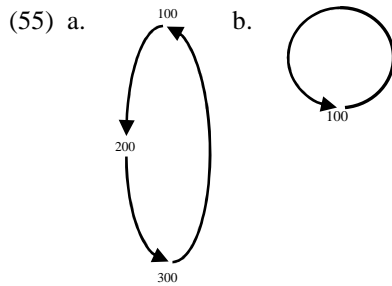
So what the No Circuit Law excludes all situations where either an element x bears a grammatical relation to itself, or where an element x is part of some element y such that y bears a grammatical relation to x. The motivation to exclude the first situation should be obvious: it captures the general fact that grammatical relations are established between *distinct* elements, that is, no element is for example the direct

object in relation to itself, or a subject to itself, etc. The motivation for the exclusion of the latter situations[36] has to with the observation that structures in which a coreferential expression refers back to an expression *which the coreferential expression is part of* are impossible. Consider the following examples.

(56)   a. John proved a theorem, and Mary knows it.
        b. John proved that Mary knows that Peter thinks it.

In (56b) 'it' cannot refer back to the clause 'John showed that Mary thinks that Peter knows …' although the pronoun 'it' can in general refer back to clauses as shown in (17a) where 'it' refers back to the first sentential conjunct. The reason why (56b) in contrast to (56a) is ungrammatical is because it violates the No Circuit Law, as the partial structures for the two sentences reveal.

(57)   (58)
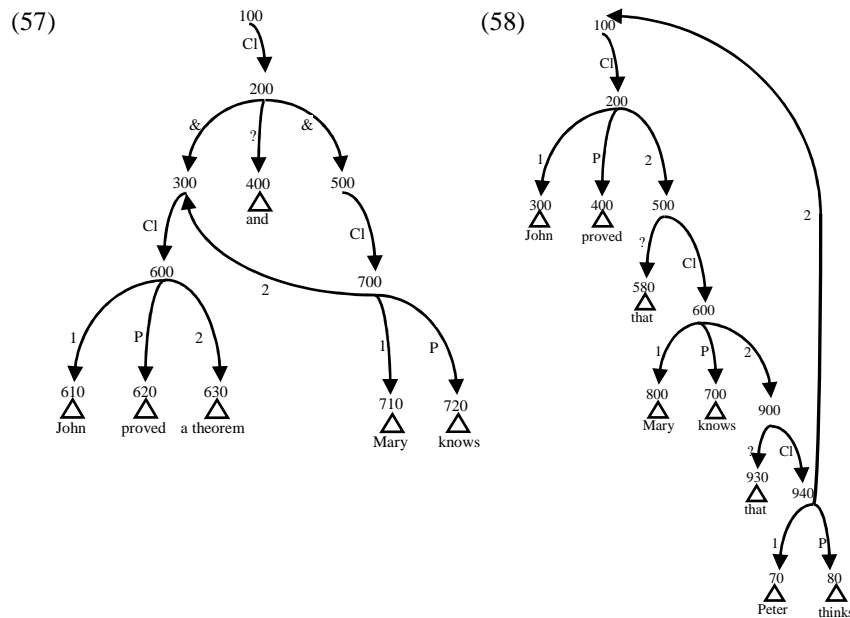
As I show in more detail in section 6 of chapter 6, coreference is handled via overlapping arcs too (I deliberately ignore how the pronouns in these examples enter the structure, cf. section 6 of chapter 6). In both structures, overlapping arcs are present. What differentiates (57) from (58) and therefore (56a) from (56b) is that in (58) the two arcs related via overlapping are part of a circuit, which is not the case in (57). Consequently, the latter structure violates the No Circuit Condition and is excluded as desired, whereas the fromer one is compatible with it[37].

---

[36] Cf. Johnson & Postal 1980, pp. 99-100.

[37] At first sight, the No Circuit Law seems to be incompatible with Bach-Peters sentences (cf. Bach 1970), illustrated in (i).

(i)   The man who needed it got the medication which he ordered.

I have stated above that a metagraph is a set of arcs connected via Sponsor and Erase. However, not every arc in a metagraph is sponsored and not every arc in a metagraph is erased. It is very useful to refer to these two types of arcs. Unsponsored arcs are called *initial arcs*, and unerased arcs are called *surface arcs*. The formal definitions are given in (59).

(59)   a.   Def.: *Initial Arc*
                Initial Arc (A) $\leftrightarrow \neg\exists$B (Sponsor (B,A))
        b.   Def.: *Surface Arc*
                Surface Arc (A) $\leftrightarrow \neg\exists$B (Erase (B,A))

These two concepts make available a tool to capture that every sentence has associated with it a meaning side and a realization side. More specifically, for any given metagraph, one can extract two subgraphs: one consisting of all and only the initial arcs, and one consisting of all and only the surface arcs. The former one is assumed to represent all those aspects relevant for the semantic interpretation of a sentence and is called *L-Graph* ('Logical Graph'). The latter one represents all the aspects relevant for the realization of a sentence and is called *S-Graph* ('Surface Graph'). The R-Graph, the L-Graph and the S-Graph for the sentence 'Homer I think likes beer' are given in (60)-(62), respectively.

(60) R-Graph   (61) L-Graph   (62) S-Graph
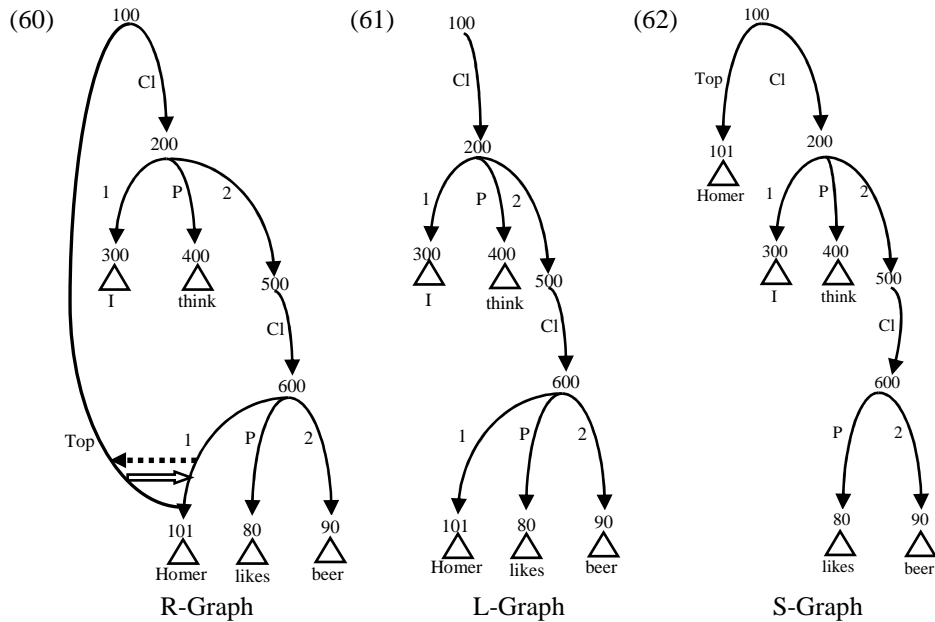
The problem posed by these sentences is that their structures would contain circuits under the assumption that pronouns are derived – in some sense – from their antecedents. However, Bach-Peters sentences can be given structures without circuits under the assumption that the antecedents for the offending pronouns in such sentences are not the full NPs but only the nouns of that NPs.

The L-Graph does not represent the meaning itself of a sentence, neither does the S-Graph represent the surface realization of a sentence; both only figure as the relevant *input structures* over which the meaning (in the case of the L-Graph) or the precedence relations (in the case of the S-Graph) is computed. In addition, it is not the case that every arc of an R-Graph either belongs to the L-Graph or to the S-Graph, as is the case in example (60). There can be arcs that are part of neither L- nor S-Graph. This situation arises if some arc is both sponsored and erased. Given the definitions in (59), it is neither an initial nor a surface arc and is hence neither part of the L- or the S-Graph. Such arcs seem dubious at first sight, but are nevertheless relevant for the proper description of syntactic phenomena, for example for intermediate relations in extraction constructions (that is, for what is usually called successive cyclicity). Finally, as the arcs are labeled, the labels of the initial arcs are in principle also visible for the semantic component. This is most prominently the case with what I dubbed Oblique and Mod RS arcs, that is, those arcs specifying all kinds of adverbial relations in a clause or a nominal constituent, for example *location* or *direction*.

Having S-Graphs at one's disposal, one can finally make the notion of 'non-presence' alluded to in the description of Erase a bit clearer: it simply means that an erased arc is not part of the S-Graph. With respect to (30), the Top-arc is part of the S-Graph for this relationship is eventually overtly realized, whereas it is not part of the L-Graph as this relation is irrelevant for the meaning of the sentence. Similarly, the 2-arc of a clause with the unaccusative predicate in (31) is present in the L-Graph but not in the S-Graph for the element heading the 1-arc does occur for example in the canonical, preverbal subject position.

In addition, a problem glossed over in the discussion of the mechanism computing linear precedence is solved. Consider again the structure (31), repeated here as (63) for convenience.

(63)

John dies.
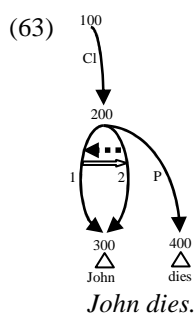
The problem is that the linearization mechanism described so far computes linear ordering for neighboring arcs. In the case of (63), this has the unwelcome result that the structure should be unlinearizable. Consider why. There are two arcs headed by an element with the integer '300', viz. the 1-arc and the 2-arc. But the 'less than'-relation is irreflexive, so that it is impossible to specify an ordering among the two arcs. But restricting the set of arcs relevant for linearization to arcs present only in the S-Graph, no such problem arises: only the 1-arc is present, and the linearization condition can be satisfied.

5.7   Other Features of APG

I finally mention some general features of APG that are relevant for the understanding of an APG analysis.

First, as already hinted at at various points earlier in this chapter, the grammar of every natural language consists of well-formedness conditions. These conditions are formulated as *material implications*, that is, they are all of the type: A → B. A sentence S of some language L is well-formed iff the structure of S, Str_S, satisfies all well-formedness conditions of L's grammar, G_L. In other words, a sentence of L is grammatical iff its structure is a *model* of G_L. APG therefore belongs to the set of *model-theoretic syntactic frameworks* (cf. Pullum & Scholz 2001), another prominent representative of which is Head-driven Phrase Structure Grammar (Pollard & Sag 1994). This is important only insofar as the conditions I deal with in this thesis must be understood as well-formedness conditions on structures, and not as rules by which some structure is assembled. Rather, given some structure X, a grammar simply checks whether X satisfies all conditions of G_L; if yes, it is a sentence in L, if not, then it is no sentence in L.

Second, there are two disjoint sets of well-formedness conditions, the first one is called *laws*, and the second one is called *rules*. Although they are formally indistinguishable, they differ in their scope: laws are putatively valid in *all* languages, whereas rules are *language specific* conditions[38]. So when laws and rules are mentioned in the following chapters, one should bear in mind that they cannot be used interchangeably[39]. I briefly sketch the interplay between rules and laws. Most importantly, rules must be consistent with laws. What makes rules special is that they are not *entailed* by them. The effect of rules is that they *restrict* the set of structures allowed by the laws instead of *expanding* them. In other words, every language is a subset of universally allowed structures, as succinctly expressed in the following quote from Johnson & Postal 1980, p. 656.

(64)   *"The task for individual grammars is only to exclude from particular languages objects which, though sentences in other languages, happen not to be sentences in these."*

To clarify that issue, consider extraction structures. According to the analysis of extraction to be developed in the next chapter, extraction structures generally involve a substructure where an overlay arc is the F-successor of some distinct arc. The only requirement put on the overlay arc's F-predecessor is that this predecessor is itself not an overlay arc. Informally, this requirement can be expressed as follows.

---

[38] Laws and rules are therefore similar to principles and parameters, respectively, from the Government and Binding framework. One should however bear in mind that not every principle from the Government and Binding framework is equivalent to a law in APG. For example, Principle B, which restricts the occurrence of personal pronouns, is treated as a universal well-formedness condition in the Government and Binding framework, but has the status of a rule in APG; cf. fn. 81 of chapter 6 for details.

[39] One should also bear in mind that laws and rules I use, refine, and develop in this work are nothing but specific hypotheses about their form, and not definite in some sense. For they can turn out to be faulty (by being too permissive or too liberal) or it could turn out that some of them can be unified to a much smaller set.

(65)   For every overlay-arc A, there is an arc B such that
        (i) A is an F-successor of B, and
        (ii) B is not an overlay-arc

Universally, this allows extraction of basically all types of arguments. However, particular languages might put additional constraints on the overlay arc's F-predecessor. For example, whereas German does, English disallows extraction of indirect objects, cf. (66) & (67).

(66)   a. Wem hast du t Parfüm gegeben?
        b. die Frau, der ich t Parfüm gegeben habe
        c. Der Frau (der) hab ich Parfüm gegeben.
        d. Es war die Frau, der ich t Parfüm gegeben habe.

(67)   a.* Who did you give t perfume?
        b.* the woman who I gave t perfume
        c.* Joan, I gave t perfume.
        d.* It was Joan who I gave t perfume.

                                                           (Postal 1998, p. 3)

So English has a rule that bars extraction of indirect objects, or to put it more technically, English has a rule that excludes 3-arcs as F-predecessors to overlay arcs. It is informally stated in (68).

(68)   *English 3-Arc Rule*
        For every overlay-arc A, there is no arc B such that
        (i) A is an F-successor of B, and
        (ii) B is a 3-arc

This rule removes from the set universally licit extraction structures all those structures where the overlay arc A has a 3-arc F-successor. This rule is obviously not entailed by the general constraint on extraction formulated in (65) but it is nevertheless consistent with it. For all that (65) requires is that there is some non-overlay predecessor B for the overlay arc A, but not that B is a 3-arc.

Thirdly, there is no lexicon in APG. This of course does not mean that there are no words. It only means that words have the same status as rules: they restrict the universally allowed structures by regulating the connection between form and meaning (cf. chapter 6, section 9 for some details). This is relevant for the understanding of my analysis insofar as I later formulate rules restricting the presence of words that explicitly mention the syntactic context they have to appear in. Although this property is gaining more and more acceptance recently it seems (it is, for example, a standard assumption in the nanosyntactic framework (Caha 2009; Starke 2009) and to a certain extent also in Distributed Morphology (Halle & Marantz 1993; Harley & Noyer 2003)), I nevertheless wished to include for those not familiar with this idea.

Fourthly, APG adopts a very different perspective on the nature of languages and grammars. More specifically, APG adopts a Platonist view according to which

languages and grammars are abstract objects[40], which view clashes of course with
the predominant view of modern linguistics according to which languages and
grammars are mental or biological objects[41]. Consequently, the conditions
formulated in APG about the structure of languages must not be understood as
claims about mental operations or mental representations[42]. Similarly, given this
view, attempts similar to the ones formulated within the Minimalist Program
(Chomsky 1995a) to reduce grammatical conditions to general cognitive principles[43]
cannot be formulated in APG.

5.8   Summary

This chapter has given a general overview of the Arc Pair Grammar framework,
although emphasis has been put on the specific tools of this framework needed for
the analysis presented in what follows. I have first introduced the main idea of APG,
viz. that grammatical relations are primitive concepts, which idea is formally
expressed by developing the concept of arc. I have also discussed in more detail the
format of arcs and some of their important properties, in particular the labeling of
nodes and labels, and the connections between arcs. I then turned to another
important idea of Arc Pair Grammar, viz. that grammatical relations interact within a
sentence. This idea was expressed via two primitive relations holding between arcs,
viz. Sponsor and Erase, and three non-primitive relations between arcs, viz. Local,
Foreign, and Ancestral. I then introduced the notion of R-Graph, which is the formal
tool to represent sentences, and the notions S-Graph and L-graph, which tools are
used to convey the idea that every sentence expresses some meaning (L-Graph) via
some form (S-Graph). Lastly, I highlighted some general properties of Arc Pair
Grammar, viz. its model-theoretic orientation, its approach to universal and
language specific aspects of languages (laws vs. rules), its rejection of a lexicon, and
its Platonist view on languages and grammars.

---

[40] Cf. Postal 2012 for an outline of this view and a discussion of its superiority over a view that takes
languages and grammars to be objects of the natural world.

[41] The second sentence of Chomsky 1995a makes this view explicit: "One approach, assumed here, takes
language to be part of the natural world." (p. 167).

[42] This is not to say that APG has nothing to offer for psycholinguistics. For the conditions governing
some language L must eventually somehow be represented within the brain of the speaker of L. All that
APG denies is that the conditions themselves are part of that speaker's brain. Similarly, the ability of
humans to count does not make the successor function part of the human brain.

[43] "Conditions on representations – those of binding theory, Case theory, θ-theory, and so on – hold only
at the interface, and are motivated by properties of the interfaces, perhaps properly understood as modes
of interpretation by performance systems." (Chomsky 1995a, pp. 170-1)
"The strongest minimalist thesis would be this:
(2) Language is an optimal solution to legibility conditions." (Chomsky 2000, p. 96)

Chapter 6

An Arc Pair Grammar Analysis of Wh-Copying

6.1 Introduction

I showed in chapter 2 that wh-copying (cf. 1a) patterns in all respects with regular wh-question extraction (cf. 1b), the only difference being the presence of the resuming element, that is, the element underlined in (1a).

(1)   a. **Wen** glaubst du <u>wen</u> sie t liebt?
              who believe you who she loves
    b. Wen glaubst du dass sie t liebt?
           who believe you that she loves
           Who do you think she loves?

In chapter 3, I uncovered a number of properties of wh-copying not discussed before in the literature. These properties relate to the position and the status of the resuming element. Concerning its position, I argued that the resuming element occupies a clause left peripheral position, that is, the position hosting extracted elements. Regarding its status, I provided evidence for a novel characterization of the resuming element as an *agreeing free relative proform*, that is, as a proform that is taken from the set of free relative proforms and that agrees in a number of features with the extracted element, that is, the element set in bold in 1a. In chapter 4, I showed that the properties of the resuming element lead to serious problems for previous analyses of wh-copying because most of these are not compatible with the properties of the resuming element, and the one approach that is compatible with these properties is so only at the price of treating them as accidental. This problem is serious because it is only the resuming element that turns a regular wh-question extraction into wh-copying. Therefore, the failure to account for the properties of the resuming element in particular amounts to a failure to provide an analysis of wh-copying in general.

The aim of this chapter is to show that by adopting the Arc Pair Grammar framework introduced in chapter 5, a successful analysis of the resuming element in

particular and therefore of wh-copying in general can be arrived at. Apart from one single rule guaranteeing the presence of the resuming element, all its other properties are shown to follow either from universal aspects of sentence structure as conceived of in APG or from general aspects of German syntax. In other words, the properties of the resuming element need not be specified within this rule, and therefore need consequently not be treated as accidental.

This chapter is organized as follows. In the next section, section 2, I present the structure of the Arc Pair Grammar analysis I develop. More specifically, I argue for a division of the properties of the resuming element into four blocks. In section 3, I give a brief informal outline of the analysis of the resuming element within Arc Pair Grammar. In the following sections, section 4-8, a detailed analysis of each of the blocks and the properties they contain is given. In the last section, section 9, I summarize the main results of the chapter.

6.2   The Structure of the Arc Pair Grammar Analysis

Considering the problems of the previous analyses of wh-copying, it turns out that two properties of the resuming element are particularly problematic for these analyses. The first property is the status of the resuming element as a *proform*, that is, as an element that lacks a lexical noun. Neither the full nor the partial copy analyses can account for this property, and for the adjusted partial copy analysis it is only an accidental property. The second problematic property are the agreement restrictions put on the resuming element, and more specifically, those agreement restrictions regulating the distribution of *case*, *prepositions*, and *adverbs*. The cleft analysis cannot account for these effects, neither can the complementizer agreement analysis. The partial copy analysis cannot account for PPs as resuming elements, and for the adjusted partial copy analysis these agreement restrictions are again only accidental properties of the resuming element.

Since these two properties seem to pose insurmountable obstacles to the previous analyses, a successful analysis necessarily has to account for them. Given their special status, I call them from now on *primary properties*, summarized in (2).

(2)   *Primary Properties of the Resuming Element*
        The resuming element
        (i) is a proform
        (ii) is subject to agreement restrictions regulating the distribution of
             a.   case
             b.   prepositions
             c.   adverbs

The primary properties are set in opposition to what I call the *secondary properties* of the resuming element, provided in (3).

(3)   *Secondary Properties of the Resuming Element*
        The resuming element
        (iii) occupies a clause left peripheral position
        (iv)   agrees in φ-features with the extracted element
        (v)   is a free relative proform

This division in the properties of the resuming element forms the basis for the structure of the Arc Pair Grammar analysis I develop in this chapter. By and large, I first deal with the primary properties of the resuming element and then turn to the secondary properties. Lastly, I illustrate the interaction of these analyses with an example for each type of resuming element, that is, for a sentence containing an NP as a resuming element, for a sentence containing a PP as a resuming element, and for a sentence containing an adverb as a resuming element.

6.3   Outline of the Arc Pair Grammar Analysis

Before I present the detailed analyses and their interaction, I give a brief and informal overview of these analyses I develop in the following six sections.
In section 4, I first develop a very sketchy account for the structure of both clausal and non-clausal constituents. This is useful because the analyses are easier to develop against such a general background.
In section 5, I present the APG analysis for proforms, develop an APG analysis for extraction, and show that the status of the resuming element as a proform follows from an interaction of these two. More specifically, extraction generally defines the relevant context for the presence of proforms, and the resuming element is simply the result of exploiting this option. Since the presence of a proform is in general optional in APG, I formulate the relevant rule that forces the presence of the resuming element. Crucially, this rule only specifies the position of the resuming element. All other properties of the resuming element follow from independent requirements on the structure sanctioned by this rule.
In section 6, I develop an APG analysis for the distribution of case, adpositions, and adverbs, all of which are analyzed as surface reflexes of grammatical relations. In other words, it is grammatical relations that regulate their distribution. The agreement restrictions regulating their distribution between the extracted element and the resuming element are shown to follow as a side effect from a general feature of the rule regulating the presence of the resuming element. More specifically, the extracted element and the resuming element have to agree in the grammatical relation they bear. Since it is grammatical relations that regulate the distribution of case, adpositions, and adverbs, and since both the extracted element and the resuming element bear the same grammatical relation, they are specified identically in this respect.
In section 7, I develop an Arc Pair Grammar analysis for the agreement in φ-features holding between proforms and their antecedents. The treatment of agreement proper is based on the idea that a proform and its antecedent need to have identical, that is,

overlapping arcs internal to them, viz. of those arcs specifying φ-features. Importantly, this requirement has to be satisfied by proform-antecedent pairs in general. Since the connection between the resuming element and the extracted element is simply a specific instance of this general case, agreement for φ-features is obtained. Importantly, it is obtained without requiring this in the rule regulating the presence of the resuming element itself. Rather, this rule is satisfied by a structure that also has to satisfy the requirement of identical φ-features.

In section 8, I investigate the distribution of proforms and determiners, and formulate the rules that regulate their distribution. Based on this investigation, I argue that only wh- and d-proforms match the structure in which the resuming element appears. All other proforms and determiners require a context that is too specific in order to match the structure where the resuming element is sanctioned.

In sum, I aim to show that the properties of the resuming element follow either from universal aspects of sentence structure or from language-specific requirements at work in German that are so general as to be independently motivated beyond wh-copying structures.

6.4   The Structure of Constituents

6.4.1   Introduction

In this section, I briefly sketch the core assumptions about the internal structure of both clauses and the constituents that clauses are composed of. I intentionally say 'core assumptions' because a full account of the representation of constituents is beyond the scope of this work. Nevertheless, I introduce all those assumptions relevant for the later chapters. In addition, many of the assumptions are rather uncontroversial and only represent one way to embody them in APG. I first give a very general law establishing a connection between structural and non-structural-arc, turn to the laws regulating the structure of clauses, and finally discuss the structure of non-clausal constituents.

6.4.2   Introducing Non-Structural-Arcs

Due to its arc-based orientation, it is assumed within APG that the internal structure of constituents is also composed of arcs, albeit of a special set of arcs, viz. Non-Structural-arcs. So the first issue one has to deal with is the connection between Non-Structural and Structural-arcs. I suggest the following two laws.

(4) *The Basic-Arc Branch Law (First Version[1])*
Basic-Arc (A) → Branch (B,A) ∧ POS-Arc (B)

(5) *The POS-Arc Support Law*
POS-Arc (A) ∧ Branch (A,B) → Basic-Arc (B)

The first law says that if there is a basic-arc, then this basic-arc has a POS-arc branch. Informally speaking, this part guarantees that clause-internal grammatical relations have to be expressed via some part of speech. The second law says that all POS-arcs that are branches are branches of basic-arcs. Informally speaking, this law guarantees that part of speech categories are restricted to clause-internal grammatical relations, that is, that part of speech categories themselves cannot function as clause-internal grammatical relations. The parts of speech I assume are: clauses, nouns, adjectives, verbs, and particles[2]. Importantly, neither law specifies which POS-arc can be the branch of which basic-arc. They only say that basic-arcs are the support of POS-arcs, and vice versa. This liberal formulation is intended because it captures a significant aspect of natural languages, viz. that there is no one-to-one correspondence between the *form* of a constituent and the *relation* it bears[3]. For example, a predicate can be realized as a verb, adjective, noun, or particle.

(6) a. Peter **schläft**.
    Peter sleeps.
 b. Peter ist **müde**.
    Peter is tired.
 c. Peter ist **Ingenieur**.
    Peter is an engineer.
 d. Peter ist **weg**.
    Peter is off.
 e. Peter ist nicht **ohne**[4].
    Peter is not   without
    One should watch out for Peter.

The simplified structures for these examples are given in (7)-(11)[5].

---

[1] This law is reformulated in section 7 in order to guarantee compatibility with flagging structures.
[2] For the notion particle, cf. chapter 5, especially fn. 22.
[3] This observation is hardly novel. It can be found in Jespersen 1927, p. 206, and is explicitly stated both in Huddleston & Pullum 2002, pp. 23-6, and Heidolph et al. 1981, p. 180.
[4] In its function as a predicate, *ohne* requires negation, that is, it is a negative polarity item. This is not untypical for a predicate in German; the German modal verb *brauchen* also requires negation.
[5] One might object that all these structures do involve a verb, viz. a copula verb, so that there is a one-to-one connection between being a predicate and being a verb after all such that the copula is the predicate of the clause. There are two arguments against this view however. First, many languages have no copula but nevertheless have clauses equivalent in meaning to (7)-(11). Although one could object that such languages have zero copulas and therefore simply a silent verb as predicate, the second argument shows that this can't be correct: for many languages employ non-verbal copulas, cf. Doron 1986; van Gelderen 2011. For these languages then it would be a rather artificial claim that they involve a zero verb functioning as a copula since they already contain an overt copula. Unfortunetly, such an account leaves the status of the copula unresolved. At this point, I have no idea how to treat copulas.

(7) 100 Cl 200 1 P 300 Peter 400 V 500 schläft

(8) 100 Cl 200 1 P 300 Peter 400 A 500 müde

(9) 100 Cl 200 1 P 300 Peter 400 N 500 Ingenieur

(10) 100 Cl 200 1 P 300 Peter 400 Prt 500 weg

(11) 100 Cl 200 1 P 300 Peter 400 Prt 500 ohne
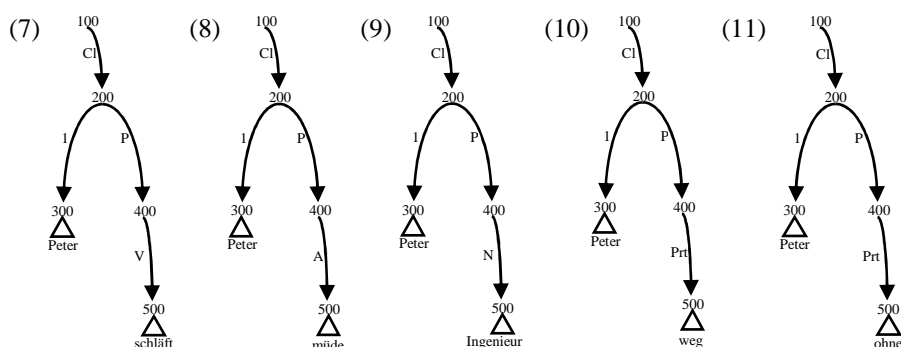
Similarly, adverbials can be expressed many ways: as particles, as nominal constituents, or as clauses.

(12) a. Peter arbeitet **lange**.
      Peter works   long
      Peter works long hourse.
   b. Peter arbeitet **den ganzen Tag**.
      Peter works the whole day.
   c. Peter arbeitet **während andere arbeiten**.
      Peter works while others sleep.

Additionally, as is well known, subjects and objects can be expressed either by nominals or by clauses. Certainly, not every part of speech can express every grammatical relation, but this is most likely an effect of language particular rules.

It also needs to be guaranteed that any basic-arc supports only one POS-arc; this requirement is encoded via the following law.

(13) *The POS Exclusiveness Law*
      POS-arc (A) ∧ POS-arc (B) → ¬Colimb (A,B)

This law says that two distinct POS-arcs cannot be neighbors[6]; as POS-arcs are permitted only as branches of basic-arcs, this law excludes a basic-arc with more than one POS-arc as a branch, as desired. In other words, the structure in (15), corresponding to the ungrammatical (14), is excluded because the P-arc, a basic-arc, has two POS branches, viz. the V-arc and the N-arc.

(14) * Peter **schläft Ingenieur**.
      Peter sleeps engineer.

---

[6] The non-distinctness is expressed via the notion Colimb, which, as specified in chapter 5, refers to neighboring arcs having different head nodes. If this condition referred to neighbors in the consequent, then POS-arcs would be excluded altogether because of the reflexivity of the neighbor-relation. In other words, as every arc is its own neighbor, the equivalent of (13) with Neighbor instead of Colimb would bar all structures with POS-arcs.

(15)
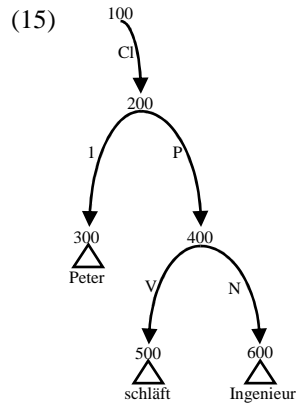
6.4.3 The Structure of Clauses

In this subsection, I outline the most minimal assumptions about the structure of clauses needed for my analysis. I provide laws that guarantee that clauses eventually look as exemplified in (16).

(16)
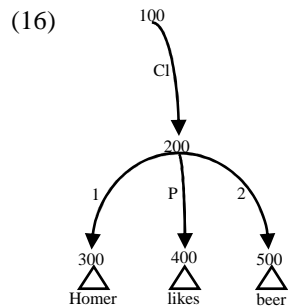
What needs to be guaranteed is that every metagraph is a sentence[7] and that clauses in general consist immediately of arcs that bear only a proper subset of all possible R-signs[8]. Regarding the first issue, that every R-graph is a sentence is guaranteed by the following law.

---

[7] This is a simplification. For there are sentences that don't look like clauses, lacking predicates and arguments. These include interjections or expressions like 'Peter!'. Whether such cases can be analyzed as sentential remnants or require a serious modification of the concept 'sentence' is beyond the scope of this work. Moreover, whatever solution turns out to be correct, it has no influence on my analysis.

[8] I ignore here the question whether constituents like 'VP' or 'IP' are needed, and if yes, how they can be integrated into the analysis developed here for clauses. With regard to the questions whether such constituents are needed, the answer is yes, since these units pass all constituency tests. Regarding their integration, I consider an analysis of them in terms of separate clauses as most promising (cf. McCawley 1998, ch. 8). However, since neither issue is of any importance to my analysis, I deliberately ignore them.

(17)   *The Clausal Root Law*[9]
        Root Arc (A) → Cl-Arc (A)

This law mentions a yet unspecified type of arc, viz Root arc, cf. (18).

(18)   Def.: *Root Arc*
        Root Arc (A) ↔ ¬∃B (Support (B,A))

So rrot arcs all those arcs that lack a support. The Clausal Root Law then says that
the root node of every metagraph is the tail node of a Cl-arc, which means that all
metagraphs are sentences. It excludes metagraphs like the following ones.

(19)   (20)
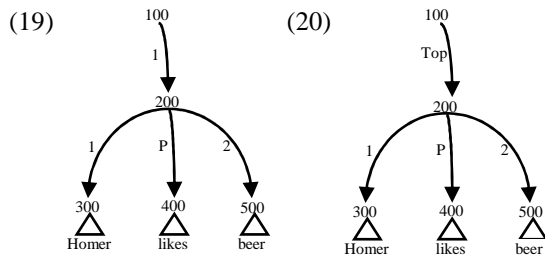
In (19), the root node is the tail node of a subject-arc, whereas the structure in (20)
contains a root node that is the tail node of a Top-arc. One then needs to specify that
the labels of the branches of Cl-arcs are restricted. I suggest the following law.

(21)   *The Cl Branch Law*
        Cl-Arc (A) → ∃B (Branch (B,A) ∧ Predicate-Arc (B) ∧ ∀C (Neighbor (C,B)
        → Argumental-Arc (C)))

This law says that every clause immediately consists of a predicate plus elements
bearing an *argumental* grammatical relation, that is, subjects, objects, adverbials
(alternatively obliques, cf. chapter 5), but crucially not elements like determiners or
adpositions. In (22) and (23), I have illustrated some structures excluded by this law.

(22)   (23)

---
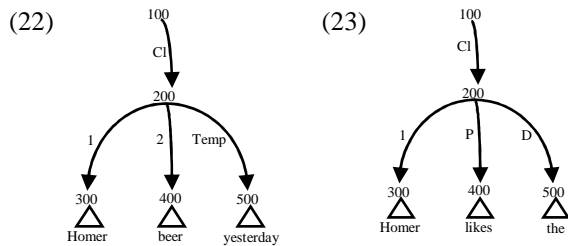
[9] This law does not violate the POS-Arc Support Law. At first sight, it might seem to because there is a
POS-arc, viz. the Cl-arc, which is not the branch of some basic-arc. However, the law is defined only for
those POS-arcs that already *are* branches, and therefore remains silent about POS-arcs that are *not*
branches of some arc.

The structure in (22) is not permitted because it contains no predicate, whereas that in (23) is not permitted because it contains a determiner as an immediate element. I lastly show how embedded clauses are dealt with under this analysis. Fortunately, their existence follows from the Basic-Arc Branch Law in connection with the Cl Branch Law. Since Cl-arcs are themselves POS-arcs, nothing excludes a situation where a basic-arc like a 2-arc has a Cl-arc as its POS-arc branch, as shown in (24).

(24)
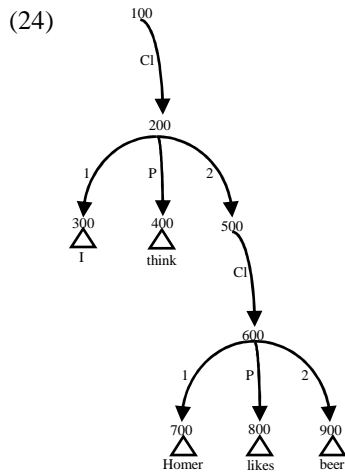
Importantly, since the second Cl-arc in (24) is subject to the same law as the first Cl-arc in (24), the second Cl-arc must consist of the same type of relations as the first Cl-arc. Thereby, recursive embedding of clauses follows without further specification[10].

6.4.4 The Structure of Non-Clausal Constituents

In this subsection, I present the most minimal assumptions regarding the structure of non-clausal constituents. What needs to be specified is the internal structure of such constituents, viz. that they can contain more than one word and how words themselves are structured.

The first relevant law specifies the branch of a POS-arc.

---

[10] Pirahã might be an exception to this, since it not only lacks clausal recursion, but recursive embedding altogether (Everett 2005, 2009, 2010). This peculiarity can be captured by the following rule.

(i) *Pirahã Non-Recursion Rule*

POS-Arc (A) $\wedge$ POS-Arc (B) $\wedge$ R-Branch (A,B) $\wedge$ A $\neq$ B $\rightarrow$ $\neg$Equivalent (A,B)

This rule excludes all structures where a POS-arc has as one of its R-branches an equivalent POS-arc, of which the structures in (24) is an example, where a Cl-arc R-supports another Cl-arc. The existence of such a rule comes as no surprise in light of the APG treatment of language particular features. For under the APG treatment, rules simply restrict the set of admissible structure. This is precisely what happens in Pirahã because it restricts the number of admissible structures, albeit in a way unfamiliar from the perspective of a speaker of an Indo-European language, viz. by excluding all recursive structures.

(25)   *The POS Stem Law*
        POS-Arc (A) ∧ ¬Cl-Arc (A) → ∃B Stem-Arc (B) ∧ Branch (B,A)

(26)   *The Stem Support Law*
        Stem-Arc (A) → ∃B (Branch (A,B) ∧ POS-Arc (A))

The first law says that for every POS-arc that is not a Cl-arc, there is a Stem-arc branch. The second says that every Stem-arc is a branch of a POS-arc. The following law specifies the set of possible branches for Stem RS-arcs.

(27)   *The Stem-Arc Branch Law*
        Stem-Arc (A) → ∃B∃C (L-Arc (B) ∧ PH-Arc (C) ∧ (Branch (B,A) ∧ Branch (C,A))

According to this law, every Stem-arc has two branches, one labeled 'L', the other labeled 'PH'[11]. Stem arcs therefore have the function of hosting the arcs expressing form and meaning of a part of speech (excluding Cl-arcs of course). In order to accomplish this, one has to specify what elements eventually head L- and PH-arcs. This question brings us back to terminal nodes. I assume the following.

(28)   *The L-Arc Termination Law*
        L-Arc (A) ↔ Logical Node (Head, A)

(29)   *The PH-Arc Termination Law*
        PH-Arc (A) ↔ Phonological Node (Head, A)

Both laws require that L-arcs and PH-arcs be headed by terminal nodes and by the right kind[12]. Finally, the place of the Agr-arcs has to be specified. I adopt the following law.

(30)   *The Agr-Arc Neighbor Law*
        Agr-Arc (A) → ∃B (Stem-Arc (B) ∧ Neighbor (A,B))[13]

This law says that Agr-arcs are neighbors of Stem-arcs, that is, they are 'higher' in the structure than L- and PH-arcs. The motivation for having Agr-arcs not as neighbors of PH- and L-arcs is that every word (and therefore every POS-arc) carries a meaning and a form, but not every word necessarily carries φ-features. In order to capture this, one has to make reference to the specific label that the POS-arc bears. For example, whereas nouns but not adjectives bear φ-features in English, in German both nouns and adjectives bear φ-features. Having Agr-arcs as neighbors of

---

[11] Contrary to other laws regulating the internal structure of words, this law is not formulated as a biconditional. This means that it doesn't say that L- and PH-arcs are restricted to words. This weakening is needed in order to guarantee compatibility with idioms, whose meanings are connected to multi-word expressions. An investigation of how to include idioms into this system is beyond the scope of this work.
[12] Internal to APG, words are theoretically analyzed as rules that restrict the parings of L-arcs to PH-arcs. For example, the word *beer* is analyzed as a rule demanding that the PH-arc headed by /biːə/ to be a neighbor of the L-arc headed by 'BEER', and not to the L-arc headed by 'JUICE'.
[13] This law is not formulated as a biconditional for neighbors of Stem-arcs are not restricted to Agr-arcs.

Stem-arcs allows a simple way to state the relevant rules: all that these rules specify is the support of the Agr-arc. For example, in German the rule in (31) is needed, whereas English is subject to the rule in (32)[14].

(31)   *Agr Rule German*
        Agr-Arc (A) → ∃B (Support (B,A) ∧ (N-Arc (B) ∨ A-Arc))

(32)   *Agr Rule English*
        Agr-Arc (A) → ∃B (Support (B,A) ∧ N-Arc (B))

Additionally, one needs to specify what arcs appear under the Agr-arc and what these arcs are headed by. The following laws achieve this.

(33)   *The Agr-Arc Branch Law*
        Agr-Arc (A) → ∃B (Non-Core-Arc (B) ∧ (Branch (B,A))

(34)   *The Non-Core Support Law*
        Non-Core-Arc (A) → ∃B (Agr-Arc (B) ∧ Support (B,A))

(35)   *The Non-Core Termination Law*
        Non-Core-Arc (A) ↔ Grammatical Node (Head, A)

The first law restricts the branches of Agr-arcs to Non-core-arcs. The second says that the support of Non-core-arcs is restricted to Agr-arcs. The third demands that Non-core-arcs be headed by terminal nodes belonging to the set of Grammatical nodes[15]. Lastly, it has to be assured that every part of speech has unique phonological, semantic, and agreement properties. The following law guarantees this.

---

[14] This argument presupposes that anything except nouns could *inherently* be specified for φ-features. This assumption is maybe wrong because the presence of φ-features on elements other than nouns historically derives from incorporated pronominal elements. This is clearest for cases of verb agreement (Givón 1976; Corbett 1995), inflected complementizers (Fuss 2005) and inflected prepositions in the Celtic languages (Pedersen 1913; Thurneysen 1909). It is less clear for agreement on adjectives although such cases are attested, viz. in the history of Russian, where the so-called long form of the adjective derives diachronically from a combination of the short form of the adjective plus third person pronoun (Crome et al. 1983). Similarly, the strong inflection of German adjectives has been argued to derive historically from the incorporation of pronouns into the adjective (Behaghel 1923, § 108; Paul 1916, § 68). Moreover, although adjectives bear φ-features, their values depend on some head noun to which the adjective belongs. Fortunately, the force of the argument of attaching the Agr-arc as a neighbor of the Stem arc is not affected by these observations: for then, one needs to specify a law according to which the presence of an Agr-arc depends on an N-arc. Again, the easiest way to accomplish this is specifying the support of the Agr-arc.

[15] The analysis for words sketched in fn. 13 needs to include Non-core-arcs as well of course, in order for 'beer' not to carry the feature combination 2.PS.PL.FEM. Moreover, it has to be assured in some way that terminal nodes such as 'Fem' only appear under the arc labeled 'Gen', and not under the arc labeled 'Num'. This requires a further division of grammatical nodes into distinct subsets. As this complicates the analysis without direct relevance to my analysis, I ignore this issue.

(36)   *The Non-POS Exclusiveness Law*
        Non-POS-Arc (A) ∧ Non-POS-Arc (B) ∧ Equivalent (A,B) → ¬Colimb (A,B)

This law says that if two Non-POS-arcs are equivalent, then they must not be
neighbors, thereby precluding situations in which two L-arcs or two Gen-arcs appear
as neighbors. It does not exclude non-equivalent Non-POS-arcs for otherwise no
part of speech could have both phonological, semantic, and φ-features.
To illustrate the effects of all the laws consider the structure for the element heading
the 2-arc of the embedded clause in (37).

(37)
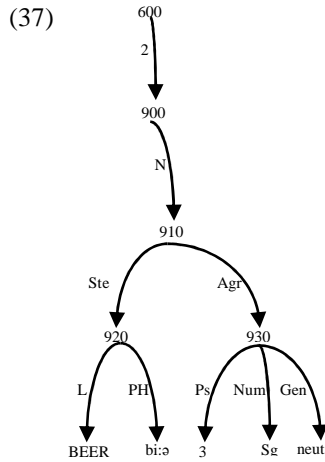
As can be easily verified, all laws are obeyed. Despite this, more needs to be done.
For nothing has been said so far about constituents larger than one word (except for
clauses). More specifically, nothing has been said about the fact that constituents can
include determiners and that they in general allow embedding of constituents (with
the exception of Pirahã, cf. fn. 11). To capture this, I adopt the following laws.

(38)   *The D-Arc Law*
        D-Arc (A) → ∃B∃C (POS-Arc (B) ∧ Neighbor (A,B) ∧ Support (C,A) ∧
        Primary-Arc (C))

(39)   *The Mod-Arc Law*
        Mod-Arc (A) → ∃B (POS-Arc (B) ∧ Neighbor (A,B))

The following structure satisfies these two laws.

(40)
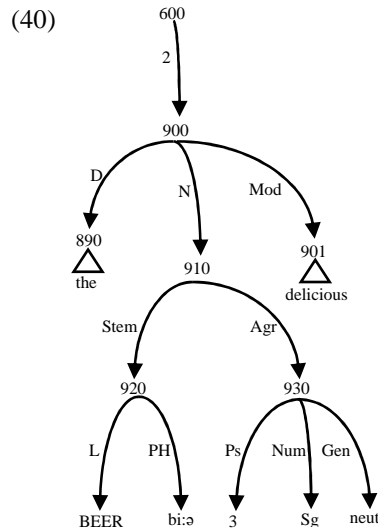
Since both D-arcs and Mod-arcs are basic-arcs, they need to support a POS-arc, thereby leading to recursive embeddings inside nominals. The important question is of course what these POS-arcs can be. Given the very general formulation in (4), any POS-arc could in principle be a branch of a D-arc and a Mod-arc. At least for Mod-arcs, this is not so far from the truth: in German both nouns[16], adjectives[17], clauses, but also particles can modify nouns.

(41) a. Der Mann mit **dem Hut**
         The man with the hat.
      b. Der **schöne** Mann.
         The handsome man.
      c. Der Mann, **den ich mag**.
         The man who I like.
      d. Der Mann **da**.
         The man there.

---

[16] Example (41a) contains a PP at the surface structure but I argue in section 7, that PPs are nothing but NPs with unbound case affixes, that is, case affixes that make up a separate word.

[17] Example (41b) contains an attributive adjective, and example (41c) a relative clause. The close connection between relative clauses and attributive adjectives has not only been long observed in traditional grammar (which calls them *Attributsätze*, Engl. attributive clauses) but also in the earliest days of Generative Grammar (Smith 1969), and also again in more recent works (Kayne 1994; Leu 2008; Cinque 2010) where adjectives are derived from underlying relative clauses. The view I adopt here shares the idea that both attributive adjectives (as opposed to predicative ones) and relative clauses have a commonality, but it need not rely on intricate mechanisms of transforming the one into the other to express this similarity. Such a mechanism is only needed because the only way to express a functional commonality between two different phrase structure trees is to assume that both trees derive from an identical tree. This is so because it is the tree configuration that defines the function of an element and the context it appears in (for example, in the case of the configurational definitions of subject and object). But with labeled arcs, this is unnecessary: what makes attributive adjectives and relative clauses similar is the arc they head, which expresses directly the relevant function, viz. modifier.

Mod-arcs are themselves subject to the Basic-Arc Branch Law, that is, they have to support a POS-arc. Since the Mod-Arc Law permits Mod-arcs to any POS-arc, it captures that modifiers allow recursive embedding, as in the examples in (42), whose simplified structures are sketched in (43) and (44); case marking by '*s* on (42a) is omitted for simplicity in the corresponding structure[18].

(42)   a.   John's father's house.
        b.   A particularly well constructed plot.

(43)   (44)
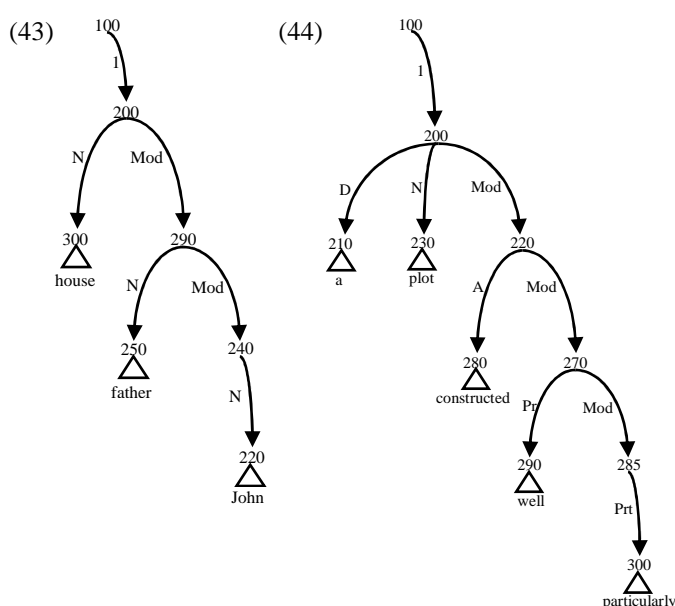
As for D-arcs, I assume that these can have as branches only two types of POS-arcs, viz. N-arcs and Prt-arcs, as expressed by the following law[19].

(45)   *The D-Arc POS Law*
        D-Arc (A) → ∃B (Branch (B,A) ∧ (N-Arc (B) ∨ (Prt-Arc (B))

German, for example, employs N-arcs, whereas English uses Prt-arcs.

---

[18] I remain silent here about the proper structure for examples such as (i) and whether they involve a structure where all modifiers appear as branches of a single node or whether they involve embedding (possibly along a fixed hierarchy, cf. Cinque 2010).
(i)   A nice little old red house.
[19] This is possibly too narrow a restriction. For in many Slavonic languages (for example in Polish, Czech, and Sorbian) article-like elements inflect like adjectives, like demonstrative and interrogative pronouns. Either the D-Arc POS Law needs revision or such elements are not determiners proper but rather modifiers internal to determiners. If the latter idea is correct, then they are similar to complex demonstratives found in Greek for example. These consist of the article 'o' and the immediately preceding element 'aftós'. Demonstratives in the Slavonic languages would then have the same structure, the only difference being that the article is empty (which it is generally in these languages).

(46)   a. **der** Mann
        b. **the** man

Treating *der* as an N-arc is motivated by the fact that it bears φ-features.

(47)   a. $\sqrt{}$der/*die/*das Mann
        b. *der/$\sqrt{}$die/*das Frau
        c. *der/*die/$\sqrt{}$das Auto

Its English counterpart *the* on the other hand does not show any signs of φ-features.

(48)   the $\sqrt{}$man/$\sqrt{}$woman/$\sqrt{}$car

In other words, *the* has a fixed shape, and is therefore analyzed as a Prt-arc[20]. The respective structures for the German and the English article are given in (49)-(50).
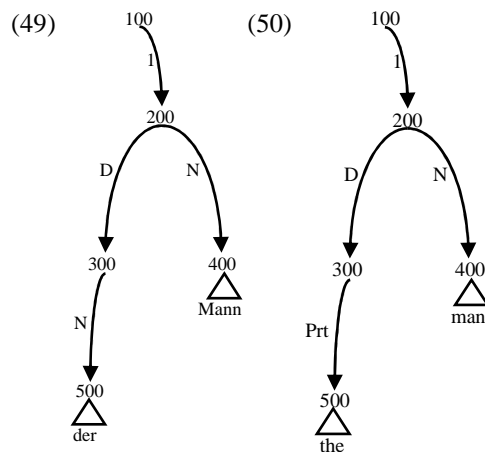
Although it might look initially strange to allow particles as articles, this state of affairs is not a peculiarity of English but is well attested in a number of genetically unrelated languages. A partial list of such languages is given in table 1[21].

---

[20] This line of reasoning – to treat those elements as particles that have a fixed shape, and those elements as nouns that don't have a fixed shape – only goes through if parts of speech are classified on purely morphological grounds. But this is in fact what I assume, cf. chapter 5, fn. 23. One might object to this line of reasoning that it would eventually analyze nouns in isolating languages like Japanese as particles. And although this analysis might seem initially bizarre, it is in fact the one adopted by traditional Japanese grammarians. What we would treat as nouns (called *meishi*) belongs to the class of *mukatsuyŏgo*, the class of uninflected elements (Lewin 1975, pp. 40-1).

[21] More than one entry along the horizontal dimension indicates allophonic variation, more than one entry along the vertical dimension indicates that the articles differ with respect to proximity.

	Article	
Language	**definite**	**indefinite**
Arabic[22]	al-	-n
Armenian (Classical)[23]	-s -d -n	/
Armenian (Modern)[24]	-a, -n	-ma, -man
Abkhaz[25]	a-	-k
Chamicuro[26]	ka na	/
Gùrùntùm[27]	-i	/
Hebrew[28]	ha-	/
Hungarian[29]	a, az	egy
Tzotzil[30]	li ti taj	/
Vai[31]	-ɛ, -e, -a	/
Welsh[32]	y, yr, -r	/

Table 1: particles as articles

I will not provide additional examples of languages where the article is noun-like for these should be well known (for example, Italian, Spanish, Modern Greek). Moreover, the part of speech status has no influence on whether or not the article is a bound form: particles can be bound (for example in Arabic) but need not be (Hungarian); nouns as articles can be bound (for example in Romanian) but need not be (German).

Finally, I assume the following law regarding D-arcs.

(51)   *The D-Arc Inexplicit Law*
         D-Arc (A) → ∀B (R-Branch (B,A) ∧ L-Arc (B) → Inexplicit (Head,B))

According to this law, what distinguishes articles from other elements supporting L-arcs is that articles put a special constraint on their supporting L-arc. For these L-arcs must contain elements form the set called *Inexplicit* in Johnson & Postal 1980. These elements differ from all other elements heading L-arcs in that they are more or less semantically vacuous, putting only very broad semantic restrictions on its

---

[22] Ryding 2005, pp. 156-165.
[23] Meillet 1913, p. 51, 64.
[24] Dum-Tragut 2009, pp. 102-112.
[25] Hewitt 1979, pp. 153-155.
[26] Parker 1999.
[27] Haruna 2003, p. 50, 62.
[28] Glinert 2005, pp. 6-7.
[29] Rounds 2001, pp. 82-3.
[30] http://www.zapata.org/tzotzil, chapter 3.
[31] Welmers 1976, p. 30.
[32] King 1996, pp. 29-35.

referent. Johnson and Postal recognize two members of Inexplicit, viz. *UN* and *O*. The former picks out a referent of any kind, whereas the latter one restricts the referent to mind possessing entities (Johnson & Postal 1980, chapter 9, section 2 and 3). The structures for the article *der* in German and the article *the* in English embodying this difference are given in (52) and (53), respectively.

(52)

(53)
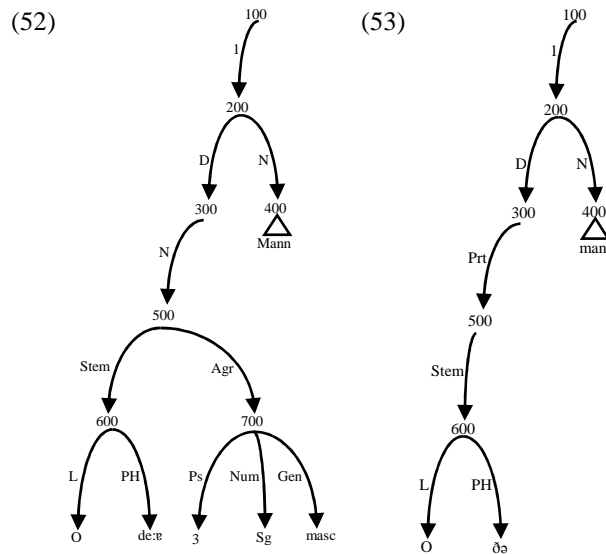
So what this law eventually says is that, informally, a D-arc must not contain a meaningful element. This is does not say that D-arcs cannot specify meaning; it only says that they can't do so via hosting elements heading L-arcs. For as mentioned in chapter 5, D is simply a cover term for many different relations which specify to what extent a referent is contextually identifiable, like 'definite', 'indefinite', 'specific', etc. These relations are already themselves visible for the semantics, and the elements heading them in addition don't bear any inherent semantic features.

6.5   The APG Analysis for the Status of the Resuming Element as a Proform

6.5.1   Introduction

In this section, I develop an analysis for the status of the resuming element as a proform. I argue that this status follows from an interaction of two analyses, viz. the one for proforms and the one for extraction. I present the analysis for proforms in section 5.2, and the analysis for extraction in section 5.3; the interaction of these two analyses is the subject of section 5.4.

6.5.2   The APG Analysis of Proforms

6.5.2.1   The Context of Proforms

The APG analysis of proforms is based on the idea that proforms are elements that, metaphorically speaking, get inserted into a structure. More technically, if a proform is part of an R-Graph, then the proform is never present in the L-Graph[33]. This idea is implemented by analyzing proforms as elements that head a special type of arc, viz. a *replacer (arc)*. What makes replacers, and therefore proforms, special is the structural context in which they appear. A replacer can only appear in a structure containing two other distinct arcs that (i) overlap and (ii) are connected by Erase, that is, one of the two arcs erases the other. This context is illustrated in (54).

(54)
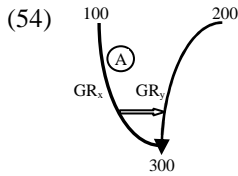
In such an environment, the erased arc can sponsor a neighboring, non-overlapping arc, as is illustrated in (55).

(55)
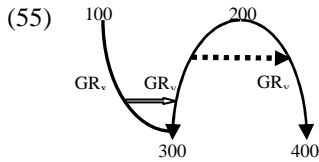
The sponsored arc in (55) is the replacer, which is headed by a proform represented by node 400. The relation between the two arcs 'GRz' and 'GRy' in (55) is called *Replace*. Its definition is provided in (56).

(56)   Def.: *Replace*[34]
       Replace $(C,B) \leftrightarrow$ Neighbor $(C,B) \land$ Sponsor $(B,C) \land \exists A$ (Erase (A,B))

Consider how the structure in (55) satisfies the definition of Replace. The GR$_z$-arc replaces the GR$_y$-arc because they are neighbors, the latter sponsors the former, and there is another arc, viz. the GR$_x$-arc, that erases the GR$_y$-arc. Before I turn to a more detailed treatment of Replace, I illustrate this relation with a more concrete example. Consider the following sentence.

(57)   Homer says that he likes beer.

---

[33]   The proform can be part of the S-Graph, although it need not be, for example in cases of invisible proforms, that is, proforms that get erased.
[34]   Adapted from Postal 2010, p. 35.

In its most salient interpretation, 'he' and 'Homer' are coreferent. The structure for the sentence with this interpretation is sketched in (58).

(58)
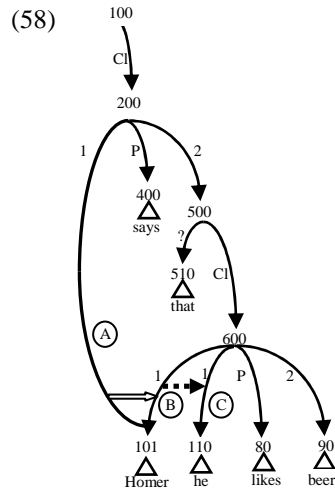
In this structure, the three arcs A, B, and C illustrate Replace. The 1-arc headed by the proform *he* replaces the 1-arc of the embedded clause, arc B, which is itself erased by a distinct arc, viz. the 1-arc A of the main clause, arc A. An immediate consequence of this analysis is that no primitive notion of antecedence is needed. Consider why. That *Homer* antecedes *he* in (58) so that they are coreferential is directly expressed since *Homer* heads the 1-arc of the main clause and the 1-arc of the embedded clause. Another consequence of this arc-based treatment of proforms is that it allows a uniform treatment of proforms, even in cases where they don't mark any coreference relation. I return to this benefit in more detail in chapter 7. In that chapter, I also discuss some apparent problems for this analysis of proforms, viz. sentences containing quantificational expressions as antecedents, cases of accidental coreference, and proxy readings of proforms. I argue that neither case is incompatible with this treatment of proforms.

The way Replace is formulated so far is insufficient because it is compatible with a number of unwanted structures. What these structures are and how to exclude them is the topic of the remainder of this subsection. I first define some helpful notions.

(59) Def.: *Replacer*
      Replacer (A) ↔ ∃B (Replace (A,B))

(60) Def. *Replacee*
      Replacee (A) ↔ ∃B (Replace (B,A))

These two definitions pick out two of the three arcs mentioned in the definition of Replace, viz., the erased arc, called the *replacee* and the sponsored arc, called the *replacer*. The first law that is needed is the following one.

(61)   *The Replace Equivalence Law*
        Replace (A, B) → Equivalent (A,B)

What this law says it that the replacer and the replacee need to be equivalent, that is, they have to bear the same R-sign. This law excludes the following structure.

(62)
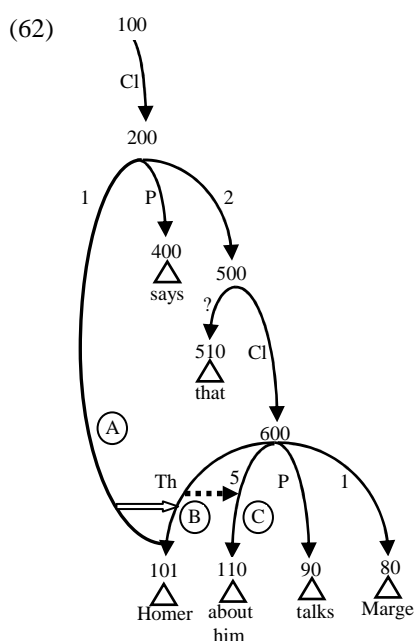
In this structure, the replacee bears the theme-relation (abbreviated 'Th'), whereas the replacer bears the 5-relation (corresponding roughly to indirect objects in English (cf. Postal 2010, chapter 2 and 3)). If this structure were admitted, then (63a) – corresponding to (62) – could have the meaning of (63b), whose structure contains a replacer equivalent to the replacee, surfacing with the preposition 'about'.

(63)   a.   Homer says that Marge talks to him.
        b.   Homer says that Marge talks about him.

But these two sentences are not synonomous, illustrating that the replacer has to conserve the relation of the erased arc.
In order to formulate the next important law, the following definition is needed.

(64)   Def.: *Second*
        Second (A,C) ↔ ∃B (Erase (A,B) ∧ Replace (C,B))

(65)   Def.: *Seconder*
        Seconder (A) ↔ ∃B (Second (A,B))

The definition in (64) defines a relation between the replacer and the arc erasing the replacee, and the definition in (65) picks out the arc erasing the replacee, called *Seconder*. With the help of these two definitions, the next important law can be formulated.

(66)   *The Seconder Law*[35]
       Second (A,C) ∧ Replace (C,B) → Overlap (A, B)

This law excludes structures like the following one.

(67)
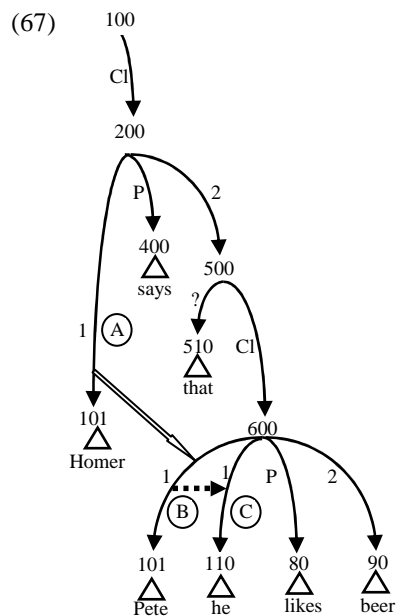
Such structures are unwelcome because they violate the basic idea underlying the analysis of proforms, viz. that the presence of a proform is a reflex of *one* element heading two arcs, one of which is erased. This is not the case in the structure in (67), for there, the two arcs connected via Erase are headed by *two* elements. However, the formulation of Replace in (56) doesn't exclude such structures; therefore, the Seconder Law is needed and excludes such structures as desired.
A further law is given in (68).

(68)   *The Replacer Uniqueness Law*[36]
       Replace (A,B) ∧ Replace (C,B) → A = C

---

[35] Adapted from Postal 2010, p. 35. Johnson & Postal 1980, ch. 11.4, reject such a law.
[36] Given the partially different assumptions in Johnson & Postal 1980, this statement could be derived as a theorem in this work, cf. Johnson & Postal 1980, p. 122.

It says that for every replacee, there is a unique replacer. This law excludes structures such as (69), corresponding to (70).

(69)
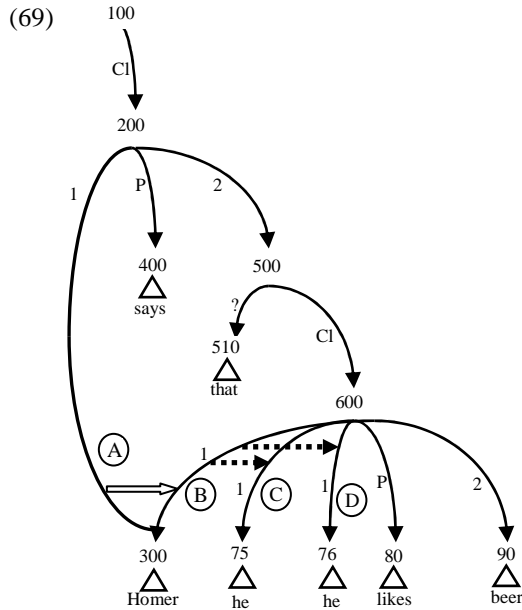
(70) * Homer says that he he likes beer.

In this structure, there are two replacers, viz. arc C and arc D, which situation is excluded by the Replacer Uniqueness Law because C and D are distinct arcs.
Given the definitions and laws formulated so far, the following theorem can be provided[37].

(71)   *The Replacer Graft Theorem*
       Replacer (A) → Graft (A)

---

[37] There are two more theorems one can give. The first one is provided in (i).
(i) *The Seconder Uniqueness Theorem*
       Second (A,C) ∧ Second (B,C) → A = B
Assume to the contrary that A and B are not distinct. The definition of Second says that if A seconds C then there is a D such that C replaces D. In order to show that this theorem holds, two cases need to be distinguished. First, A and B erase the same arc D. Or second, they erase distinct arcs, call them D and E. The first option is immediately out because it violates Eraser Uniqueness. The second case is compatible with Eraser Uniqueness because A erases D and B erases E. However, the definition of Replace demands that the replacer C be sponsored by its replacee. In this case, there are two replacees and consequently two sponsors for C, viz. D and E. This in turn violates Sponsor Uniqueness. The second theorem is provided in (ii).
(ii) *The Replacee Uniqueness Theorem*
       Replace (A,B) ∧ Replace (A,C) → B = C
Assume to the contrary that B and C are not distinct. Then A would be sponsored by two arcs, viz. B and C, thereby violating Sponsor Uniqueness.

Assume to the contrary that a replacer is not a graft. This means that the replacer is a successor. More specifically, it is the successor of the replacee because the replacee sponsors the replacer. Additionally, the replacer is an L-successor of the replacee because the definition of Replace demands that replacee and replacer be neighbors. Finally, the Replace Equivalence Law demands that replacer and replacee be equivalent. This eventually results in a structure containing an L-successor that is equivalent to its sponsor. However, this violates the L-Successor Non-Equivalence Law mentioned in the previous chapter, repeated here for convenience in (72).

(72)   *The L-Successor Non-Equivalence Law*
        L-Successor (A,B) → ¬Equivalent (A,B)

The only option left is that the replacer is a graft, that is, an arc whose sponsor doesn't overlap it. It is the only option left because two arcs can either overlap or not, irrespective of whether they are related by Sponsor. The relevance of this theorem is that it excludes structures of the type in (73), corresponding to (74).

(73)
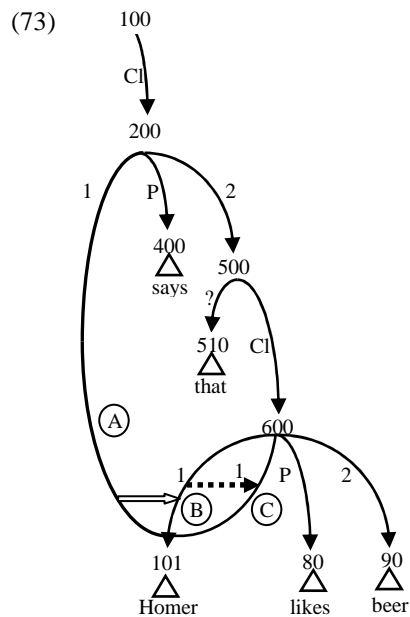
(74) * Homer$_i$ says that Homer$_i$ likes beer.

In this structure, the replacer overlaps the replacee, which is unwanted because it doesn't capture that proforms appear as substitutes. But as shown, the exclusion of such structures follows as a theorem.

Another important law that restricts the set of admissible arcs overlapping a replacer is formulated in (75).

(75)   *The Replacer Overlap Law*[38]
      Replacer (A) ∧ Overlap (A,B) → R-Successor (B,A)

This law excludes a number of bizarre structures, one of which is illustrated in (76)
corresponding to example (77).

(76)
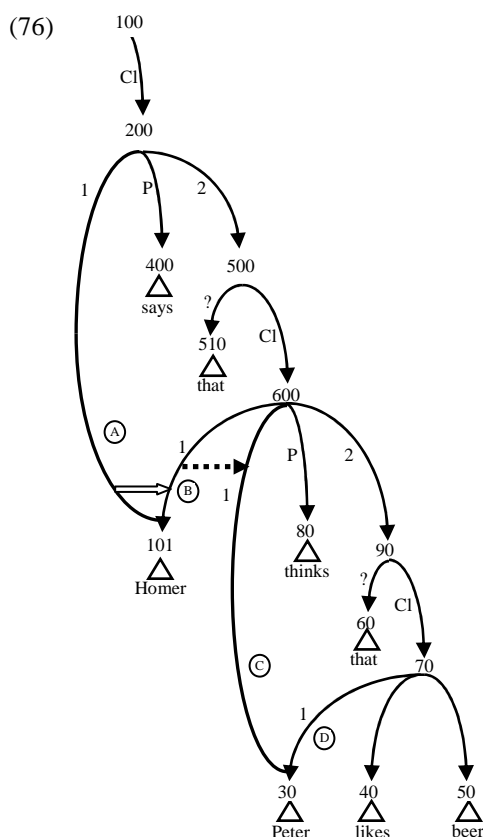
(77) * Homer$_i$ says that Peter$_i$ thinks that Peter$_k$ likes beer.

In this structure, the replacer C overlaps an initial arc D. The replacer arc is still a
graft because it is sponsored by a non-overlapping arc, and therefore compatible
with the Replace Graft Theorem. But given its status as a replacer, it is subject to the
law that all the arcs it overlaps must be R-successors of it. This is not the case in
(76) as the initial arc overlapping the replacer is not an R-successor of that replacer.

---

[38] Johnson & Postal 1980, p. 140, formulate an even stricter condition that requires not only any
overlapping arc of a replacer to be an R-successor of that replacer but of a graft in general. I have to reject
such a law because it is incompatible with an aspect of my analysis of extraction, viz. with sponsoring
properties of relational markers. For relational markers can be grafts and overlap an arc which is not an R-
successor of it; cf. section 6.3 of this chapter and section 3.3.2 of the next chapter.

Before turning to the internal structure of replacers, I specify the final law regulating the external structure replacer arcs can appear in. It is formulated in (78).

(78)   *The Replacer L-Successor Incompatibility Law*
        Replacer (A) → ¬∃B (L-Successor (B,A))

This law excludes for example the following two structures.

In the structure (79), the replacer C has a local successor-I D, which in turn also has a local successor-I (arc E). In the other one, structure (80), the replacer C has a local successor-II D. Both structures correspond to the following well-formed sentence,

(81)   Homer says that he likes beer.

This is so because the relevant relation for case marking borne by the replacer in both structures is the subject relation, and nominative marking follows as desired. But without the law in (78), such vacuous instances of successors are not excluded[39].

---

[39] One should keep in mind that the two types of successor pariring in (79) and (80) are independently motivated, so that they are excluded on grounds of involving impossible successor-pairs. The first type of successor pairing is found in pseudopassives such as (i), the second one in reflexive unergatives as in (ii).
(i)   Cleveland was lied to by Loretta.
(ii) Peter prügelt sich   gerne.
      Peter beats   SELF readily
      Peter likes to have fights with others.
Regarding details the structure for (i), cf. Postal 2010, p. 242, and for details regarding the structure for (ii), cf. section 2 of chapter 7.

6.5.2.2 The Structure of Proforms

The last result one needs to guarantee is that the replacer is headed by a proform. In other words, one needs to restrict the elements appearing as replacers to proforms, thereby excluding structures such as the following.

(82)
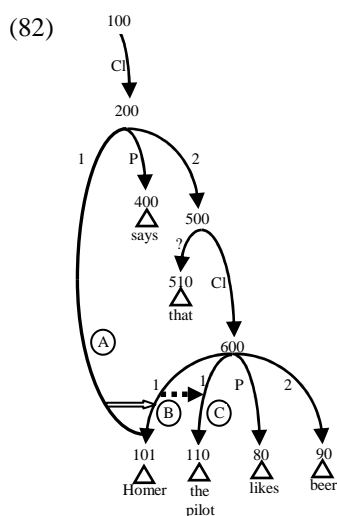
In this structure, the replacer is headed by the nominal constituent *the nice guy*. This is an unwanted result because the resulting sentence has only an interpretation where the element *a nice guy* bears an independent meaning, in contrast to proforms that do not bear an independent meaning. Yet, nothing so far excludes such structures. The exclusion of such structures requires a law guaranteeing that arcs such as C in the structure in (82) are headed by proforms only. In order to accomplish this, I refine the analysis of Replace a last time. The definition of Replace, the laws specified so far and the Replacer Theorem allow for the following two abstract structures.

(83)   (84)
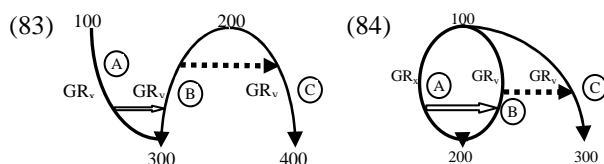
The structure in (83) should be familiar at this point because I have been dealing so far mostly with this structure. The structure in (84) didn't appear so far in this chapter but it is compatible with the definition of Replace. Consider why. Arc A erases an overlapping arc B (thereby satisfying the Seconder Law) and sponsors an arc C that is equivalent to arc B (thereby satisfying the Replacer Equivalence Law) and that is a graft. The only difference between the structure in (84) and the structure in (83) is that the seconder and the replacee are neighbors. However, nothing

excludes this option and therefore the structure counts as a Replace configuration. Surprisingly, the definition of Replace is also compatible with a third structure, shown in (85).

(85)
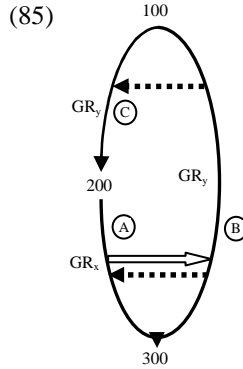
One can easily verify that this structure is not only permitted by the definition of Replace but also satisfies the two laws and the Replacer Theorem. Arc A erases an overlapping arc B (thereby satisfying the Seconder Law) and sponsors an arc C that is equivalent to arc B (thereby satisfying the Replacer Equivalence Law) and that is a graft because it doesn't overlap its predecessor B. What makes this structure weird is that the seconder is a branch of the replacer. This structure is certainly of no help for the description of proforms: no proform could possibly be present under the node 100 in (85) because this node is already headed by another element. Nevertheless, this structure is needed for the description of another phenomenon, viz. for the description of case affixes and adpositions. Therefore, one would not want to exclude this structure in general. In order to distinguish the structures satisfying the definition of Replace needed for the description of proforms from the one not needed for proforms, I distinguish between Replace-I and Replace-II. Their respective definitions are given in (86) and (87).

(86)   Def.: *Replace-I*
        Replace-I (C,B) $\leftrightarrow$ Replace (C,B) $\land$ $\forall$A (Second (A,C) $\rightarrow$ $\neg$Branch (A,C))

(87)   Def.: *Replace-II*
        Replace-II (C,B) $\leftrightarrow$ Replace (C,B) $\land$ $\forall$A (Second (A,C) $\rightarrow$ Branch (A,C))

With the help of this distinction, one can pick out those replacers that can head proforms. Such replacers are called *Pro Arcs* and they are defined in (88).

(88)   Def.: *Pro Arc*
        Pro Arc (A) $\leftrightarrow$ Replacer (A) $\land$ $\exists$B (Replace-I (A,B))

With the definition of Pro arc, it becomes possible to define the law guaranteeing that only proforms are available as elements heading Pro arcs.

(89)   *The Pro Arc Termination Law*[40]
        Pro Arc (A) → ∀B (R-Branch (B,A) ∧ L-Arc (B) → Inexplicit (Head, B))

L-arcs are those arcs specifying the meaning of a word and that Inexplicit is a subset of Logical Nodes that is more or less semantically vacuous, putting only very broad semantic restrictions on its referent. The Pro Arc Termination Law eventually guarantees that a Pro arc must not be headed by an element bearing some intrinsically lexical meaning. This excludes elements such as *the nice guy* in (82) because this element does have a meaning of its own. The important question is of course why it includes proforms. In order to answer this, I follow standard assumptions about the internal structure of proforms and treat them as determiner-like elements (cf. Postal 1969), which in APG terms means that they head D-arcs. What distinguishes proforms from other elements heading D-arcs is that not only they but also their neighboring POS-arc are headed by members of Inexplicit. In other words, proforms are used as elements heading D-arcs if the D-arc's neighboring POS-arc belongs to the set Inexplicit, whereas articles are used as elements heading D-arcs if the D-arc's neighboring POS-arc does not belong to this set[41]. The structural difference between *der Mann* (Engl. the man) and *er* (Engl. he) is illustrated in (90) and (91).

---

[40] This law should ultimately follow from a more general law regulating the distribution of meaningful elements in R-Graphs. Imagine that a meaningful element headed a Pro arc. Since the Pro arc is not an initial arc, it is excluded from the L-Graph and therefore from the graph that defines the input for semantic interpretation. This would lead to the absurd situation that a meaningful element is invisible for semantics, since the only L-Graph is visible for semantics. Unfortunately, at this point I have no idea how to formulate the relevant law.
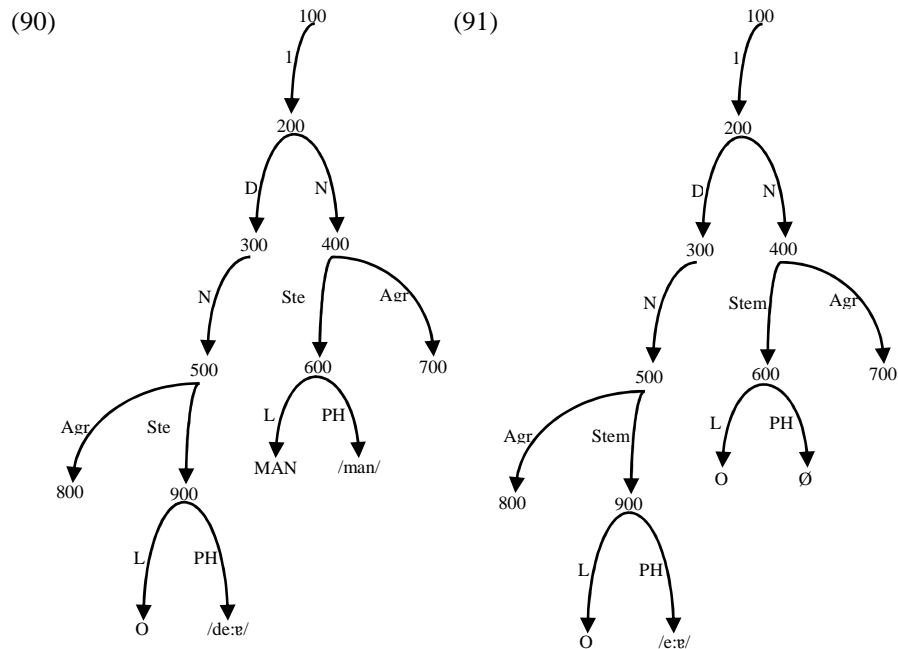
[41] Not every language is sensitive to this difference: Loniu, an Austronesian language spoken in the Manus province of Papua New Guinea, makes no distinction between third person pronouns and articles.

(i) a. **Iy** huti   e   **iy** iyew.
         she took.it and she left.
         She took it and left.
     b. **Iy** pihin   **iy** huti kawa.
         she woman she took basket
         The woman takes the basket.

                                            (Hamel 1994, p. 53, ex. 60 & p. 90, ex. 10)

(ii) a. **Seh** to?onani homow tupanah.
         they send   one   boy
         They sent a boy.
     b. **Seh** pihin   **seh** čani **uweh** kaman **uweh** weče   ake.
         they woman they clear we   man   we   cut.down tree
         The women clear, we men cut down trees.

                                            (Hamel 1994, p. 91, ex. 16 & p. 90, ex. 6)

(90)

```
           100
            1
           200
        D       N
      300         400
    N         Ste     Agr
     500      600      700
  Agr   Ste  L   PH
 800    900  MAN  /man/
      L    PH
      O   /deːɐ/
```

(91)

```
           100
            1
           200
        D       N
      300         400
    N        Stem     Agr
     500     600       700
  Agr   Stem  L   PH
 800    900   O    Ø
      L    PH
      O   /eːɐ/
```

Since it is only proforms that eventually contain only L-arcs headed by members of Inexplicit, only they can appear as elements heading Pro arcs[42].

---

[42] Treating proforms as elements similar to determiners has a number of advantages. First, it makes understandable at least partially the well-known fact that proforms have the potential to refer, but not to denote. For D-arcs and Pro arcs must terminate in L-arcs headed by members of Inexplicit. Therefore, proforms are semantically inert, excluding inter alia proforms modified by any kind of adverbials. For such adverbials either terminate in elements that do bear semantic features (and therefore do not erminate in L-arc headed by members of Inexplicit) or they terminate in elements that are members of Inexplicit, leading to a semantically vacuous modification, something that is eventually excluded on pragmatic grounds. Second, similar to articles, proforms are restricted to either nouns or particles, that is, either to elements that are inflected and mark gender and number distinctions or to elements whose shape is fixed. The former ones are well-known (for example from English, where both gender (he vs. she) and number distinctions are marked (he/she vs. they), and need no special illustration. The latter case is certainly less well-known but is attested: Pirahã uses particles as proforms.

(i) **Hiapioxio** soxoa   xo-o-xio
     3   already jungle-LOC-DIR
   *He/They already went to the jungle.*

Five more languages have been reported with this feature: Acehnese, Asmat, Guarani, Kuman (all cited in Corbett 2000, pp. 63-6, who also gives references to the relevant literature), Manem and Nimboran (Foley 1986, p. 71), and Mok (Pinnow 1965). Third, analyzing proforms as determiner-like elements also readily explains the well-known diachronic connection between them. Proforms often develop out of articles, for example those of the modern Romance languages, where the proforms derive from demonstrative determiners (Wackernagel 1928, pp. 125-152). But the opposite is also attested: the ancient Greek articles ὁ, ἡ, τό were used as proforms in Homeric Greek (Goodwin 1895, pp. 204-6), that is, the articles originally derive from proforms. Both Wackernagel and Goodwin suggest that the noun following the article originally functioned as an apposition, which structure was later reinterpreted.

6.5.3   The APG Analysis of Extraction

In this section, I develop an analysis of extraction within APG. This treatment is based on the remarks in Postal 2004, p. 69, although it differs from it in some important details. I have already sketched in chapter 5 the general idea underlying the APG analysis of extraction, viz. that extraction involves overlapping arcs, and more specifically, F-Successors. The analysis given there would assign the structure in (93)[43] to (92)[44].

(92)   Wen glaubst du dass sie liebt?

(93)
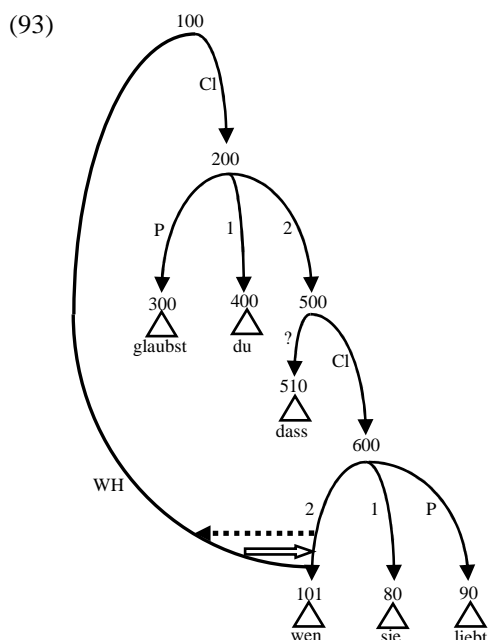
The structure I claim underlies (92) is shown in (94), and involves more F-successors than the structure in (93).

---

[43] This structure corresponds to the structure originally envisioned for extraction within APG (cf. Johnson & Postal 1980, pp. 259-271).

[44] This structure ignores the relational status of complementizers. Their treatment is generally ignored in this work, as the proper treatment of complementizers is of no relevance for my analysis. More specifically, I ignore (i) what grammatical relation complementizers bear (most likely some non-argumental R-sign), (ii) why they tend to occur only in embedded clauses, and (iii) how to account for their incompatibility with extracted elements, as observed in many languages.

(94)
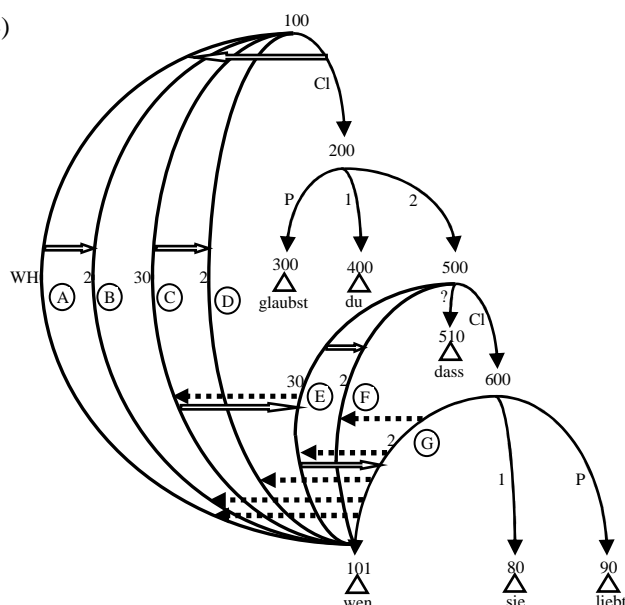
The structure in (94) differs from in three ways from the one in (93).

First, it does not only contain one proper-overlay-arc, viz. arc A, and another arc that the proper-overlay-arc overlays, viz. arc G. It also contains 30-arcs, viz. C and E in (94), that is, pseudo-overlay-arcs, in addition to the proper-overlay-arc A. 30-arcs encode the idea that extractions such as wh-question extraction not only affect the two positions where an extracted element originates and ends up but also a number of positions between these two. Informally speaking, extraction does not proceed in one fell swoop. In APG terms, one says that extraction necessarily establishes intermediate relations that are visible neither in the L- nor in the S-Graph, although they can have detectable effects on the S-Graph. 30-arcs correspond to these relations.

Second, each overlay-arc (that is, both proper and pseudo-overlay-arcs) is accompanied by a distinct parallel arc that the overlay-arc erases. These arcs are called *Relational Markers*[45]. In (94), the arcs B, D, and F are relational markers. Relational markers keep in some sense track of the path taken by an extracted element. In German for example, relational markers always conserve the grammatical relation an element bore before undergoing extraction. For this reason, the relational markers in (94) correspond to 2-arcs because the grammatical relation the extracted element *wen* bore before undergoing extraction was that of a direct object.

Third, the position corresponding to the final position of an extracted element does not only contain one overlay-arc, but two, viz. a proper-overlay-arc and a pseudo-overlay-arc (arc A and C in 94). In other words, the final position of an extracted element contains in fact two occurrences of this element.

---

[45] This terminology is adopted from Postal 2004, p. 71.

In the remainder of this subsection, I formulate the relevant laws and rules that give rise to the general structure for extractions in German. What I will not do here is provide independent support for this view of extraction. More specifically, I will not provide support for 30-arcs, nor for relational markers, nor for the labeling properties of relational markers, nor for the idea that the final position of an extracted element contains two instances of it. For the sake of brevity, support for all of these issues is postponed to the next chapter.

Before I present the analysis for extraction, I state briefly and informally what a successful extraction analysis has to accomplish. It has to guarantee that extraction starts from an arc that does not bear an overlay relation itself (in 94, arc G), proceeds via a sequence of pseudo-overlay-arcs, that is, 30-arcs (in 94, arcs C and E), to a proper-overlay-arc like 'WH' (in 94, arc A) such that every overlay-arc, be it a pseudo or a proper-overlay-arc, is accompanied by a relational marker (in 94, arcs B, D, F). In order to achieve this, three issues need to be dealt with. First, one needs to regulate the distribution of overlay-arcs in general, and the differences in distribution between pseudo and proper-overlay-arcs in particular. Second, one has to specify the relational status of the elements available for extraction. Third, one has to ensure that every overlay-arc, be it a proper or pseudo-overlay-arc, is accompanied by a relational marker.

I start with two laws regulating the behavior of overlay-arcs in general, that is, independent of their status as proper or pseudo-overlay-arcs. The first law is (95).

(95)   *The Overlay-Arc Neighbor Law*[46]
        Overlay-Arc (A) → ∃B (Cl-Arc (B) ∧ Neighbor (A,B))

This law says that every overlay-arc must be a neighbor of a Cl-arc. As the constituent headed by a Cl-arc defines a basic clause (cf. section 5), the law captures that overlay-arcs are not part of basic clauses. The second law guarantees that overlay-arcs are dependent on some other arc, that is, it captures that overlay-arcs literally overlay some other relation.

(96)   *The Overlay-Arc Non-Initial Law*
        Overlay-Arc (A) → ∃B (F-Successor[47] (A,B) ∧ Arc-Command (A,B))

---

[46] As already mentioned in the previous section, I ignore the possibly more complex internal structure of basic clauses, viz. that these very likely involve multiclausal structures. Then the Overlay-Arc Neighbor Law and the 30-Arc Neighbor Law discussed below must be restricted to Cl-arcs whose support is a neighbor of specific type of predicate-arc. I ignore this issue, as it only adds unnecessary complications.

[47] Anticipating a bit the definitions to follow, it seems at first glance that the foreign successorship of overlay-arcs can be deduced as a theorem from the Overlay-Arc Neighbor Law. However, without this condition, parallel 30-arcs connected via sponsor would be admitted, resulting in structures containing infinite sequences of parallel 30-arcs. Not excluded are of course parallel 30-arcs *not* connected via sponsorship. Such are needed in order to deal with structures containing multiple extractions, as found in many languages (cf. Engdahl & Ejerhed 1982 for the Scandinavian languages; Doron 1982 for Hebrew). I have illustrated an example of such an extraction with an example from Swedish in (i).

(i)   Vilken filmstjärna$_i$ skulle du   gärna   vilja   träffa någon$_k$ [$_S$ som t$_k$ kan presentera dig för t$_i$]?
      which moviestar   would you willingly want   meet someone   that   can introduce you to
      Which moviestar would you like to meet someone who can introduce you to?
                                                                              (Engdahl & Ejerhed 1982, p. 6)

Basically, this law says that every overlay-arc is an F-successor to some other arc such that the overlay-arc is higher in the structure than its predecessor. This latter restriction is encoded via the condition that the overlay-arc arc-commands its predecessor. The definition of arc-command is provided in (97).

(97)   Def.: *Arc-Command*[48]
        Arc-Command (A,B) ↔ R-Govern (Tail (A),Tail (B))

According to this definition, some arc A arc-commands (i) all of its neighboring arcs (including A itself) and (ii) all arcs that are R-branches of these neighbors. This notion is therefore similar to the notion of c-command adopted in generative frameworks. The condition that an overlay-arc arc-commands its predecessor therefore excludes extractions involving lowering; I illustrate this presently. The next two laws define the start and the end point of an extraction plus the sponsor and erase relations holding there.

(98)   *The Proper-Overlay-Arc Predecessor Law*
        Proper-Overlay-Arc (A) → ∃B (Shallow Arc (B) ∧ ¬Overlay-Arc (B) ∧ F-Successor- III (A,B))

(99)   *The Proper-Overlay-Arc Erasure Law*
        Proper-Overlay-Arc (A) → ∃B (Neighbor (A,B) ∧ Erase (B,A))

The first law says that for every proper-overlay-arc there exists a non-overlay-arc that is an F-Predecessor-III of the proper-overlay-arc, that is, the proper-overlay-arc is only sponsored but not erased by its predecessor. This law puts also another restriction on the sponsor of the proper-overlay-arc, viz. that it be a shallow arc; I return to the notion 'shallow arc' presently. The second law guarantees that the eraser of the proper-overlay-arc is the neighboring Cl-arc[49]. Returning to the structure in (94), the Proper-Overlay-Arc Predecessor Law is satisfied by the following substructure in (100).

The node corresponding to the relative clause is the tail of two 30-arcs, one belonging to the relative clause extraction itself, the other one to the wh-question exraction. Although parallel, they are not excluded because neither is the successor of the other.
[48] Cf. Johnson & Postal 1980, p. 257.
[49] Athough the Proper-Overlay-Arc Erasure Law does not specify that it is a Cl-arc that erases the proper-overlay-arc, this in fact follows from the Overlay-Arc Neighbor Law which restricts neighbors of overlay-arcs to Cl-arcs.

(100)
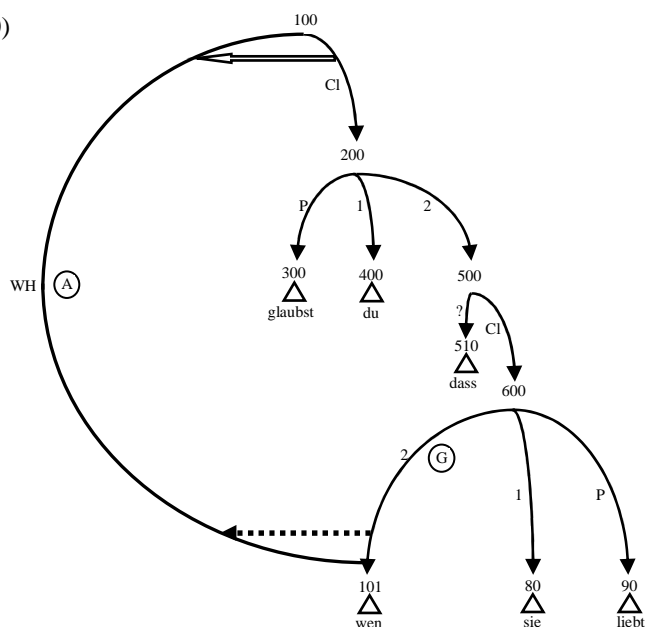
This structure contains the proper-overlay-arc labeled 'WH'. This substructure satisfies all the three laws given so far. It satisfies the Overlay-Arc Neighbor Law because it is a neighbor of a Cl-arc. It satisfies the Overlay-Arc Non-Initial Law because the proper-overlay-arc A is an F-successor and it arc-commands its predecessor, arc G. The WH-arc also satisfies the Proper-Overlay-Arc Predecessor Law because it is also an F-Successor-III. Finally, it satisfies the Proper-Overlay Erasure Law because the proper-overlay-arc is erased by its neighboring Cl-arc. The structure satisfying the Proper-Overlay-Arc Predecessor Law looks weird at first sight because the proper-overlay-arc is erased. This is weird because it apparently leads to a structure for extraction where the extraction has never any surface effects, given that the proper-overlay is not part of the S-Graph. I return to this issue presently.

The structures in (101) and (102) illustrate two structures that are excluded by the four laws so far.

(101)
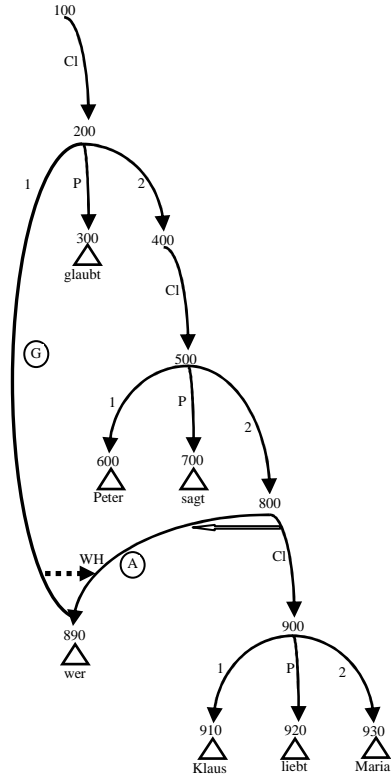
(102)
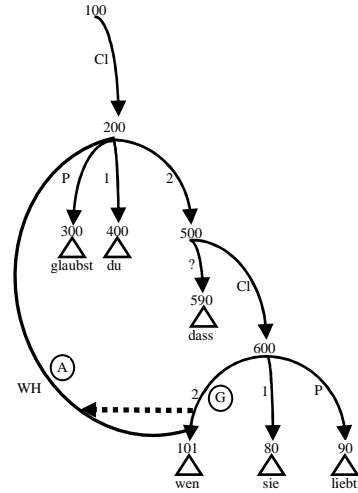
The WH-arc A in (101) satisfies the Overlay-Arc Neighbor Law because its neighbor is a Cl-arc. It also satisfies the Proper-Overlay-Arc Predecessor Law because the WH-arc is a F-successor-III to its predecessor G. It also satisfies the Proper-Overlay-Arc Erasure Law because the Cl-arc neighboring the WH-arc erases it. However, it only partially satisfies the Overlay-Arc Non-Initial Law because although the WH-arc A is an F-successor, it doesn't arc-command its predecessor G. This structure corresponds to what is called lowering, and as indicated, the condition mentioned arc-command excludes this type of extraction as desired. The WH-arc in (102) satisfies the Proper-Overlay-Arc Predecessor Law because the WH-arc A is an F-successor-III, and the Overlay-Arc Non-Initial Law because it is an F-successor and it arc-commands its predecessor G. However, it violates the Overlay-Arc Neighbor Law because the WH-arc A is not a neighbor of a Cl-arc.

Returning to the Proper-Overlay-Arc Predecessor Law, it specifies an important feature needed for the proper description of extraction because it specifies what the predecessor of a proper-overlay-arc has to be. What the Proper-Overlay-Arc Predecessor Law requires is that the predecessor is not an overlay-arc, and more specifically, that it is a *shallow arc*. As this term has not been introduced yet, (103) gives its definition.

(103) Def.: *Shallow Arc*[50]
       Shallow Arc (A) ↔ Structural-Arc (A) ∧ Output Arc (A) ∧ ∀B (F-Erase
       (B,A) → Overlay-arc (B))

Unfortunately, this definition mentions another yet unfamiliar arc type, viz. output
arc. Its definition is provided in (104).

(128) Def.: *Output Arc*
       Output Arc (A) ↔ ¬∃B (L-Erase (B,A))

An output arc is any arc that is not locally erased, that is, an arc that is not erased by
a neighboring arc. Coming back to shallow arcs, a shallow arc is then any arc that is
not locally erased and whose label belongs to the set of structural R-signs, and
which, if F-erased, is F-erased by an overlay-arc. What is crucial for the analysis of
extraction is that only shallow arcs can be targeted by extraction. This excludes inter
alia situations depicted in (105) and (106).
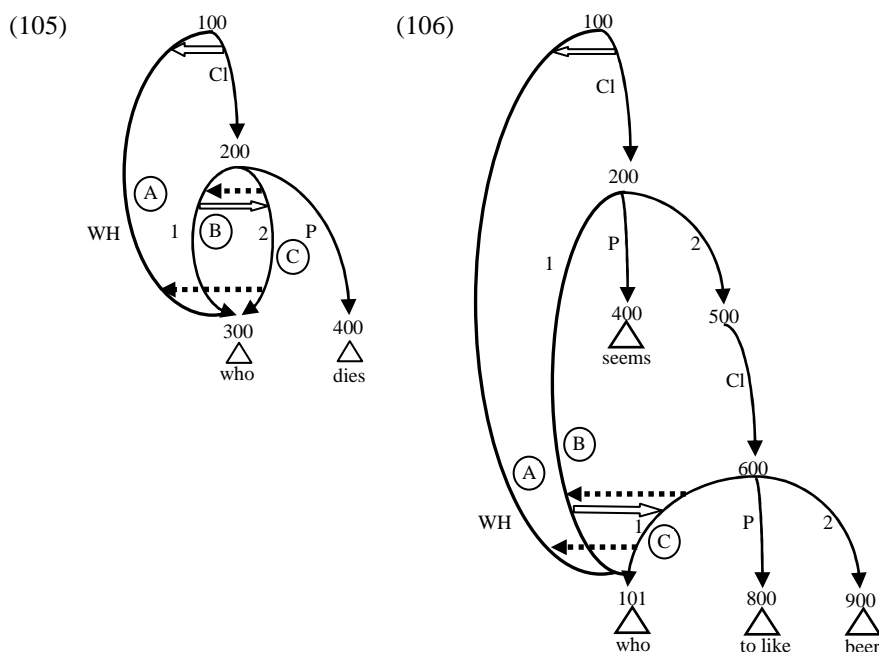
The structure in (105) contains an unaccusative predicate whose 2-arc, arc B, is the
predecessor of the WH-arc A. This state of affairs is excluded because the 2-arc is
locally erased and therefore doesn't qualify as a shallow arc. As desired, only the 1-
arc C is a shallow arc. The structure in (106) contains a raising predicate whose 1-
arc B is an F-successor of the 1-arc of the embedded clause, arc C. This 1-arc of the

---

[50] Adopted from Johnson & Postal 1980, p. 556.

embedded clause is not a possible predecessor for the WH-arc A because although C is an output arc (it is not locally erased), it is not a shallow arc because it is not F-erased by an overlay-arc, but by a 1-arc, viz. by B. The relevance of the restriction on shallow arcs is to express that extraction 'applies' after relation changing operations such as passive have 'applied'. It is useful for the later discussion to refer to the shallow arc functioning as the predecessor arc for some proper-overlay-arc. This is achieved via the definition in (107).

(107) Def.: *Starter*
       Starter (A,B) $\leftrightarrow$ Shallow Arc (A) $\wedge$ ¬Overlay-Arc (A) $\wedge$ Proper-Overlay-Arc (B) $\wedge$ F-Successor-III (B,A))

With the help of this concept, an important law can be formulated.

(108) *The Starter Uniqueness Law*
       Starter (A,B) $\wedge$ Starter (A,C) $\rightarrow$ B = C

This law captures a rather significant fact about natural languages, viz. that a single element cannot undergo multiple extraction, excluding for example cases where an element is both topicalized and focused, or both question-extracted and a relative pronoun. It does not, of course, exclude sentences where multiple extractions occur, like topicalization of some element x and focusing of another element y, because all the extracted items head different proper-overlay-arcs and have therefore different predecessors[51].

With the help of starters, we can next turn to the distribution of 30-arcs. Consider first the law in (109).

(109) *The Starter Law*
       Starter (A,B) $\rightarrow$ $\exists$C (30-arc (C) $\wedge$ F-Successor (C,A))

Basically, the Starter Law requires the presence of a 30-arc F-successor to a starter. Returning to the structure in (94), the laws specified up to this point is satisfied by the following substructure.

---

[51] Since extracted items can be distinguished from each other qua R-sign, no extended domain corresponding to a Split-CP domain is needed (Rizzi 1997). Moreover, ordering restrictions among the extracted elements can be handled by linearization statements, forcing for example topics to precede foci.

(110)
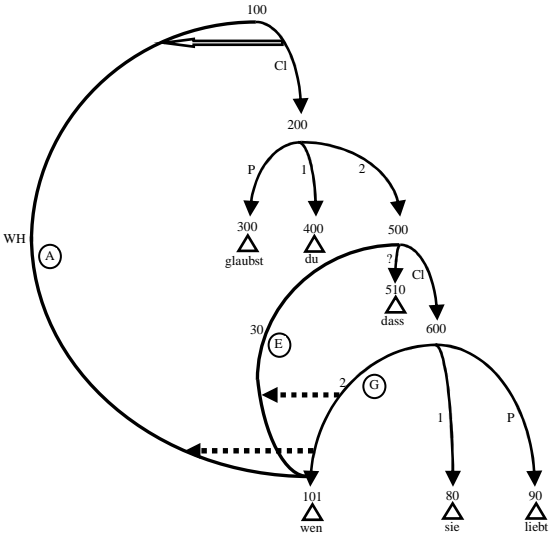
Arc A is a proper-overlay-arc that is an F-successor-III to a starter arc, viz. arc G, that is, a shallow arc. The presence of arc E is required by the Starter Law.

The Overlay-Arc Non-Initial Law demands that every overlay-arc arc-command its predecessor. Accordingly, a situation such as the one depicted in (111) is excluded where the 30-arc sponsored by the starter is lower than the starter.

(111)
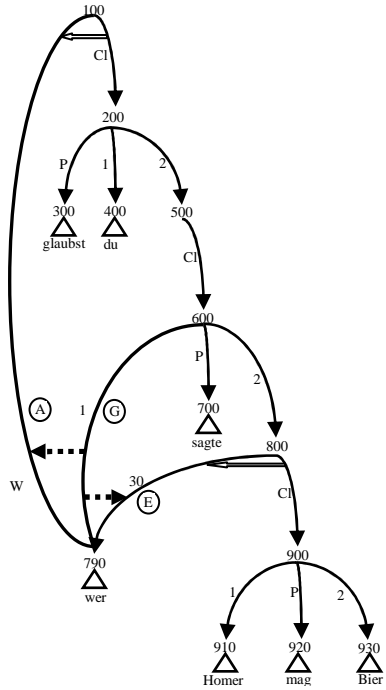
Also in this case, it is useful for later laws to refer to this 30-arc. The following definition accomplishes this.

(112) Def.: *Initiator*
    Initiator (A) ↔ 30-Arc (A) ∧ ∃B∃C (Starter (B,C) ∧ F-Successor (A,B))

The Starter Law is however insufficient for correctly predicting the distribution of 30-arcs in general because it is satisfied by any structure containing only a *single* 30-arc, whereas extraction necessarily involves more than one intermediate relation in case of long distance extraction out of a doubly embedded clause. In other words, one wants to exclude structures such as the one in (113) where only one 30-arc is present.

(113)
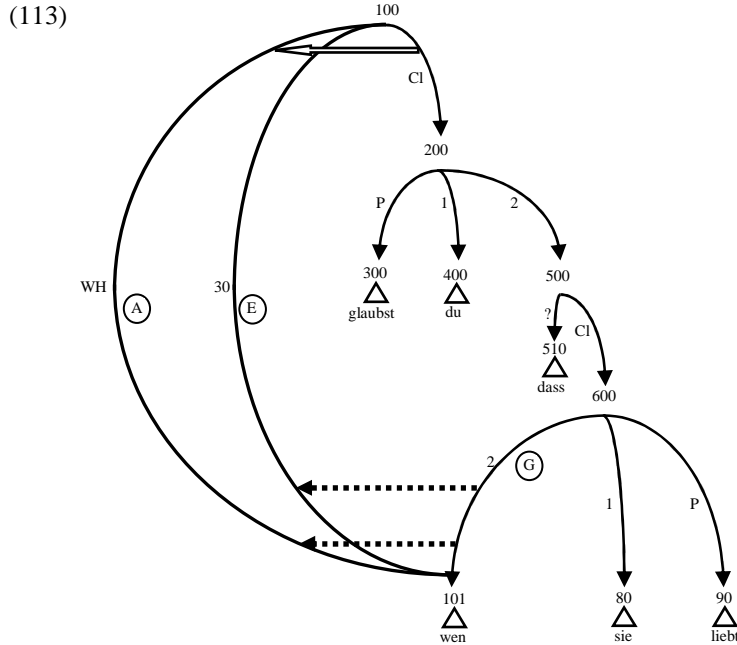
In order to arrive at the correct distribution of 30-arcs for such cases, another law is needed. This law is given in (114).

(114) *The 30-Arc Neighbor Law*[52]
    Starter (A,B) → ∀C (Cl-Arc (C) ∧ Arc-Command (B,C) ∧ Arc-Command (C,A) → ∃D (Neighbor (D,C) ∧ 30-Arc (D))

---

[52] This law differs from the one given by Postal 2004, p. 69, which required 30-arcs as neighbors of every R-support of the starter that is also arc-commanded by the proper-overlay-arc. The difference between these two formulations is that my version only requires 30-arcs as neighbors of all Cl-arcs lying between the starter and its proper-overlay-arc whereas Postal's version additionally requires 30-arcs as branches of all Cl-arcs lying between starter and its proper-overlay-arc.

Coming back another time to the structure in (94), the laws permit the following substructure.

(115)
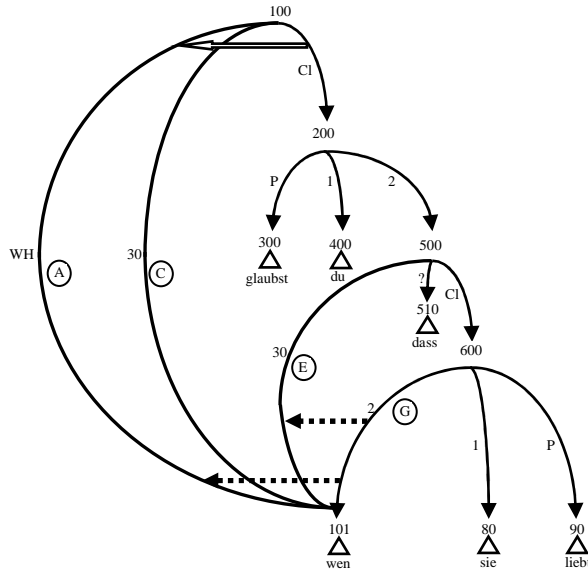
Informally speaking, the 30-Arc Neighbor Law requires two things. First, it guarantees that 30-arcs different from the initiator not only *can* appear as neighbors of Cl-arcs but that they *must* appear as neighbors of all Cl-arcs between the proper-overlay-arc and the starter. And second, it guarantees that 30-arcs can only appear to Cl-arcs that lie *between* the starter and the proper-overlay-arc. This does importantly *include* the Cl-arc to which the proper-overlay-arc is a neighbor. Coming back to the issue of proper-overlay-arcs erased by their predecessors, it is this 30-arc that I assume is the one overtly realized in extraction structures. As this 30-arc is a neighbor of the proper-overlay-arc, its position in the S-Graph is as high as that of the proper-overlay-arc and it is consequently realized in such a high position too. Although it appears odd at first sight to assume that it is the 30-arc that is overtly realized, it correctly captures the status of an extracted element throughout all the positions it occupied, viz. by assigning them the same grammatical relation '30' (in chapter 7, I present data from Chamorro that corroborate this analysis).

The 30-Arc Neighbor Law so far does not specify the sponsor relation for the 30-arcs. The following law fills this gap.

(116) *The 30-Arc Sponsor Law*
          30-Arc (A) $\wedge$ ¬Initiator (A) $\rightarrow$ $\exists$B (30-Arc (B) $\wedge$ Sponsor (B,A))

The 30-Arc Sponsor Law says that for every 30-arc that is not an Initiator there is a 30-arc sponsoring it (in fact, the sponsoring 30-arc must be an F-predecessor, which is required by the Overlay-Arc Non-Initial Law). All laws in conjunction correctly restrict the distribution of 30-arcs: they only appear as neighbors of Cl-arcs that are

in the domain of extraction, and the sponsor relations are such that every higher 30-arc is necessarily sponsored by some lower arc. With respect to the structure in (94), we arrive at the following substructure for it permitted by the laws.

(117)
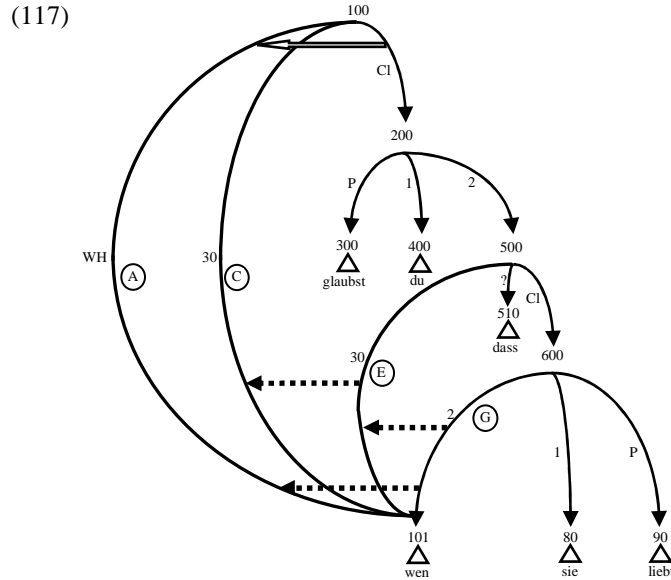
Arc A is the proper-overlay-arc with arc G as its F-predecessor-II, that is, as its starter. Arc E is the initiator since G is its F-predecessor, satisfying the Starter Law. Arc C is a 30-arc required by the 30-Arc Neighbor Law and sponsored by E due to the 30-Arc Sponsor Law.

Again, it is convenient for later purposes to distinguish a 30-arc that is a neighbor of the proper-overlay-arc from all other 30-arcs. The following two definitions accomplish this.

(118) Def.: *Terminator*
        Terminator (A) $\leftrightarrow$ 30-Arc (A) $\land$ $\neg\exists$B (Sponsor (A,B) $\land$ 30-Arc (B))

(119) Def.: *Mediator*
        Mediator (A) $\leftrightarrow$ 30-Arc (A) $\land$ $\exists$B (Sponsor (A,B) $\land$ 30-Arc (B))

The final issue surrounding the proper analysis for the distribution of 30-arcs concerns their erasers. Neither the Starter Law nor the 30-Arc Sponsor Law specify the type of the successor relation, that is, they don't specify which arc – if any – is erased. What I claim is that this is not dealt with by laws, but by rules, that is, how and whether 30-arcs are erased is a language particular property (I substantiate this claim in chapter 7, where I show that all logical possibilities compatible with the Starter Law and the 30-Arc Neighbor law are attested in natural languages). For German, I assume the following rule.

(120) *30-Arc = Successor-I Rule*

   30-Arc (A) → ∃B (F-Successor-I (A,B))

All laws in conjunction give rise to the following substructure for the extraction structure from (94).

(121)
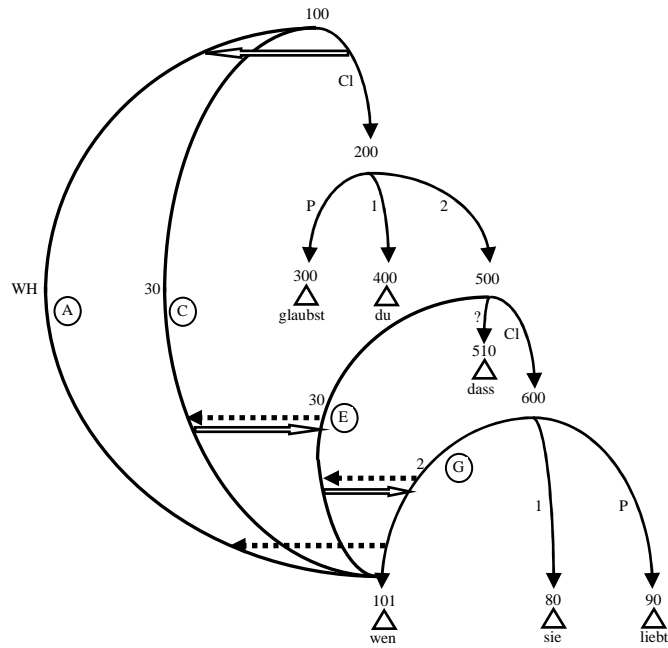
This structure differs from the one in (121) in that all 30-arcs are F-successors, that is, F-successors whose predecessors are erased.

I now turn to the final issue, viz. to the laws regulating and restricting the presence and the format of relational markers. Informally, what needs to be accomplished is two things. First, every overlay-arc is accompanied by a one (and only one) relational marker. And second, the relational marker has to bear some label. The first issue is taken care of by two laws, the first of which is stated in (122).

(122) *The Parallel Overlay-Arc Law*

   Overlay-Arc (A) → ∃B (Parallel (A,B) ∧ Erase (A,B))

This law says that for every overlay-arc, there exists a parallel arc that is erased by the overlay-arc. The latter condition ensures that the relational marker is not present in the S-Graph. Next, it is convenient to refer to this parallel arc, which is made possible by the following definition.

(123) Def.: *Rel(ational)-Marker*

   Rel-Marker (A,B) ↔ Overlay-Arc (B) ∧ Parallel (A,B) ∧ Erase (B,A)

In order to ensure that every overlay-arc has a unique relational marker, the following law is needed.

(124) *The Rel-Marker Uniqueness Law*
        Rel-Marker (A,B) ∧ Rel-Marker (C,B) → A = C

This law guarantees the following substructure.

(125)
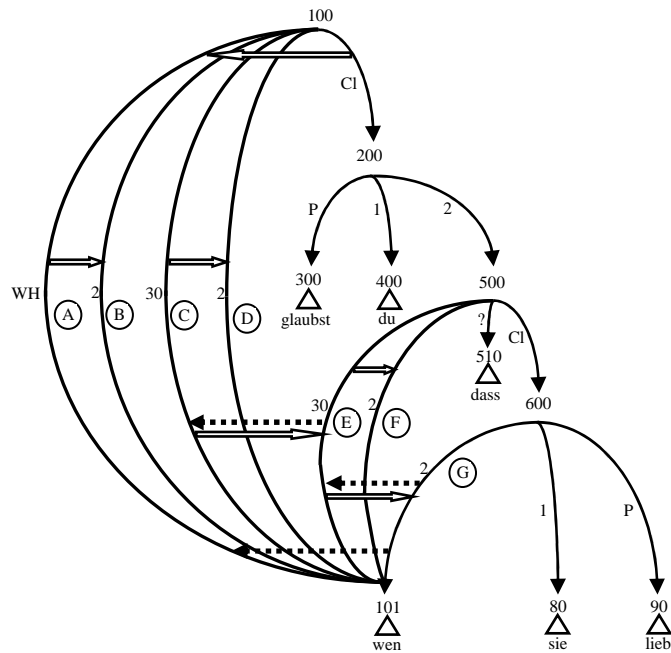
In this structure, all overlay-arcs, that is, arcs A, C, and E, are accompanied by relational markers, viz. arcs B, D, and F; in addition, as required by the Parallel Overlay-Arc Law, the relational markers are erased. Moreover, every overlay-arc is accompanied by only one relational marker, thereby satisfying the Rel-Marker Uniqueness Law. The Parallel Overlay-Arc Law guarantees that relational markers are not part of the S-Graph; however, one also needs to guarantee that they are not part of the L-Graph either because they are of no semantic relevance. Consequently, there must be some arc sponsoring relational markers. In addition, the relational markers are so far not specified for a label. Both issues are taken care of by the following law.

(126) *The Rel-Marker Sponsor Law*
        Rel-Marker (A,B) → ∃C (Sponsor (C,A) ∧ Equivalent (C,A))

It is very useful to refer to the sponsor of relational marker in a short way, which the following definition achieves.

(127) Def.: *Creator* [53]
       Creator (A,B) ↔ Sponsor (A,B) ∧ ∃C (Rel-Marker (B,C))

Although the Rel-Marker Sponsor Law already touches the second issue, viz. the labeling of the relational marker, this law is so far insufficient in that respect because it doesn't put any constraints on the arcs that can be creators. Such restrictions are however needed because in order to fulfill their task of keeping track of the path taken by some extraction, relational markers must be sponsored by arcs that are part of this extraction path. The restriction I put on admissible creators is that only starters or arcs of which the starter is a branch can be creators. Capturing this restriction formally is less trivial than it appears. I first provide the following definition.

(128) Def.: *Host*
       Host (A,B) ↔ Shallow Arc (A) ∧ ∃C (Starter (B,C) ∧ R-Branch (B,A))

This definition relates some starter arc B to itself and to any arc A of which it is an R-Branch. With this definition, the law regulating admissible creators can be formulated.

(129) *The Creator Law*
       Rel-Marker (A,B) ∧ Creator (C,A) → ∃D (Host (C,D) ∧ R-Sponsor (D,B) ∧ Arc-Command (B,C))

This law says that if some arc C is the creator for some relational marker A, then C is either the starter D or an R-support of the starter D; this is guaranteed by the restriction on hosts in the consequent clause. The restriction that D R-sponsors the overlay-arc B to which the relational marker A belongs is needed so that only those starters are relevant that form an extraction path with B. Otherwise, some starter can sponsor some relational marker, even if both would not belong to the same extraction. Finally, the restriction that the relational marker B arc-commands its creator C is needed to ensure that only the path between the relational marker B and the starter C is visible. Although the Creator Law correctly restricts the set of *possible* creators, it does not specify the set of *actual* creators instantiated in some natural language. The Creator Law allows one of the two situations: either the starter uniquely determines the label of some relational marker, or the element containing the starter (where containment is understood as a reflexive relation). I assume that no language allows both options simultaneously, and suggest that each language is subject to the law in (130) and in addition to this to one of the two rules in (131) and (132).

---

[53] The definition of creator does not mention the equivalence condition from the Rel-Marker Sponsor Law because the equivalence follows as a theorem from the Unique Sponsor Law. Assume to the contrary that A sponsors B and that A's label is different from B's label; the Rel-Marker Sponsor Law requires that there is some arc sponsoring B, call it D, such that D's label is equivalent to B's label. But then B would be sponsored by two arcs, viz. A and D, which violates the Unique Sponsor Law. Therefore, that A has to bear the same label as B needs not be explicitly mentioned in the definition for creator arc.

(130) *The Proper-Overlay Creator Law*
Rel-Marker (A,B) ∧ Creator (C,A) ∧ Proper-Overlay-Arc (B) → ∀D (Sponsor (D,B) → Overlap (C,D))

(131) *Starter = Creator Rule*
Rel-Marker (A,B) ∧ Creator (C,A) → ∀D (Sponsor (D,B) → Overlap C,D))

(132) *Host = Creator Rule*
Rel-Marker (A,B) ∧ Creator (C,A) → ∀D (Sponsor (D,B) → R-Support (C,D))

The law in (130) says that the relational marker belong to a proper-overlay-arc is always sponsored by the starter it belongs to. The other two rules therefore only restrict the sponsor properties of relational markers belonging to 30-arcs. The first rule in (131) represents the option compatible with the Creator Law according to which the starter is always the creator[54]. The second rule represents the option according to which the creators for relational markers belonging to 30-arcs differ, depending on the clause the relational marker appears in. For German, I assume that the first rule is at work, that is, in German it is always the starter that determines the label of a relational marker. All the laws and rules specified in this section give rise to the structure in (94), repeated here for convenience in (133).

(133)

---
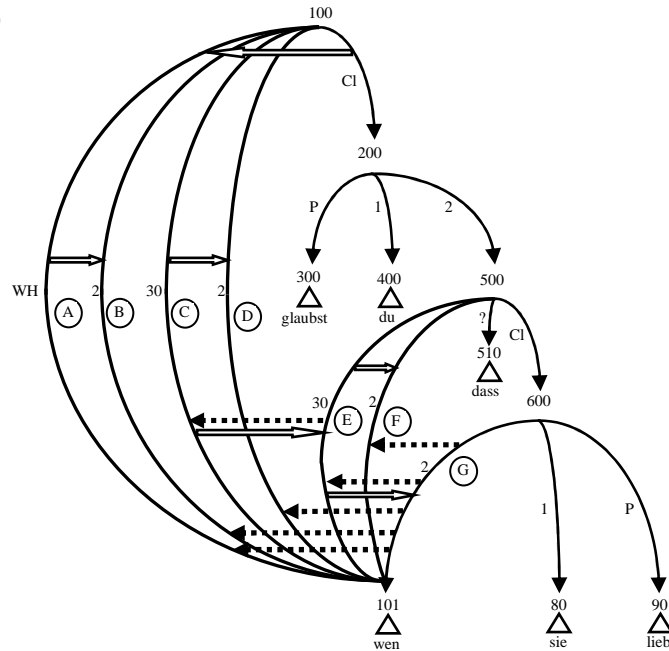
[54] This is so because the rule demands that the arc D sponsoring the overlay-arc B to which the relational marker B belongs must overlap the creator C. And the only arc satisfying this demand is the starter for only the starter also satifies the Creator Law. This demands that a creator is host for the starter. And although arc D overlaps other 30-arcs and other relational markers, none of them are hosts for the starter.

6.5.4   Why the Resuming Element is a Proform

I have so far presented the APG approach to proforms and the APG approach to extraction. Provided with this background, I am now in the position to eventually deal with the character of the resuming element as a proform.

6.5.4.1   Analyzing the Resuming Element as a Replacer

Consider again the structure in (133). It involves a multitude of overlapping arcs connected by Erase. As shown in the section on proforms, proforms head replacers and those are sponsored by an arc that is erased by an overlapping arc. Importantly, extraction creates the relevant context for the presence of replacers. This now allows a straightforward treatment of the resuming element: *it is nothing but a replacer*. The proform status of the resuming element follows without further saying under this analysis because replacers can only be headed by proforms. Consequently, the structure I propose for (134) is the one in (135).

(134)   **Wen** glaubst du   <u>wen</u> sie t liebt?
      who believe you who she loves
      Who do you think she loves?

(135)
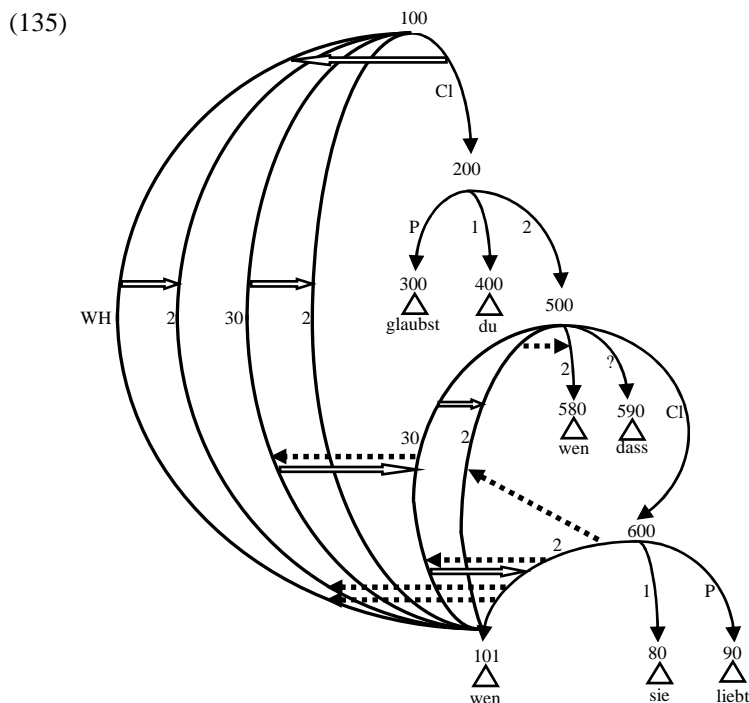
This structure in (135) differs from the one in (133) in containing a replacer in intermediate position that replaces the 30-arc's relational marker. This replacer is permitted because the relational marker is erased by an overlapping 30-arc.

What has to be guaranteed is that such a replacer is present in the first place, for overlapping arcs linked via Erase are only a *necessary* condition for the presence of a replacer, but not a *sufficient* one. For this, a rule is needed. I propose the following statement of the relevant rule.

(136) *Wh-Copying Rule German*
       Mediator (A) $\land$ Rel-Marker (B,A) $\rightarrow$ $\exists$C (Replace (C,B))

The rule mentions the notion *mediator*, which is any 30-arc sponsoring another 30-arc (cf. 119). The rule in (136) says that whenever there is relational marker B belonging to a 30-arc A such that A sponsors another 30-arc, then there is C such that C replaces B.

6.5.4.2   Virtues of this Analysis of the Resuming Element

Although the analysis for the resuming element is far from complete by now, I already want to point to a number of benefits of an analysis that takes the resuming element to be a replacer to a relational marker.

The first virtue of this analysis is that the rule in (136) embodying this analysis accounts immediately for the fact that the resuming element is a proform, that is, that it heads a Pro arc, *even though the rule doesn't mention Pro arcs at all*. In fact, given the rule in (136), the status of the resuming element as a proform follows as a theorem, as stated in (137).

(137) *German Wh-Copying Theorem 1*
       Mediator (A) $\land$ Rel-Marker (B,A) $\land$ Replace (C,B) $\rightarrow$ Pro Arc (C)

This theorem says that when there is an arc C replacing the relational marker of a mediator then arc C is a Pro arc. To see that this in fact follows as a theorem, consider again the definition of Pro arc in (88), repeated here for convenience.

(138) Def.: *Pro Arc*
       Pro Arc (A) $\leftrightarrow$ Replacer (A) $\land$ $\exists$B (Replace-I (A,B))

According to this definition, a Pro arc is a replacer heading a replacer satisfying the definition of Replace-I. The definition of Replace-I was given in (86), and is repeated in (139).

(139) Def.: *Replace*-I
       Replace-I (C,B) $\leftrightarrow$ Replace (C,B) $\land$ $\forall$A (Second (A,C) $\rightarrow$ $\neg$Branch (A,C))

This definition picks out those cases of Replace where the replacer is not a support of its seconder, that is, it excludes the following replace configurations.

(140)

Therefore, in order to show that the German Wh-Copying Theorem is in fact a theorem, one needs to show that only Replace-I is possible in the structure (135). Luckily, this too follows as a theorem, which is stated in (141).

(141) *German Wh-Copying Theorem 2*
       Mediator (A) ∧ Rel-Marker (B,A) ∧ Replace (C,B) → Replace-I (C,B)

Assume to the contrary Replace-II (C,B) to be possible. Replace-II is satisfied if a replacer is the support of its seconder. In (135), the seconder of the replacer H is arc E. So, in order for Replace-II to be satisfied in this structure, H would have to be the support of E. Now, the replacee of H is arc F, E's relational marker. As shown, F and E are parallel; in fact, they have to be parallel, which is required by the definition of relational marker. If H were the support of E, it would also be the support of F. Importantly, H and F are also required to be neighbors by the definition of Replace. However, in this scenario, H would be the neighbor of F and its support. This would result in the following substructure for (135).

(142)

As can be seen, Replace-II would require the presence of a circuit in (135), that is, the presence of an arc whose two endpoints are identical. However, this violates the No Circuit Law from chapter 5, repeated here in (143).

(143) *The No Circuit Law*
       Metagraph (X) → ¬∃A (A ∈ X ∧ Circuit (A))

This law says that no structure in any language must contain a circuit. So the reason why the status of the resuming element as proform follows as a theorem is the following. Although the rule in (136) is silent about whether the structure contains an instance of Replace-I or Replace-II, the structure with an instance of Replace-II would result in a structure with a circuit. This however is excluded by the No Circuit Law. Therefore only Replace-I can be satisfied, and therefore only Pro arcs are permitted. And since Pro arcs can only be headed by proforms, the presence of proforms in wh-copying follows without mentioning proforms at all.

The second virtue of such an analysis is that it accounts immediately for the fact that the resuming element is a proform *independent of the status of the extracted element*. That is, the structure in (145) for (144) is equally permitted.

(144) **Welchen Mann** glaubst du <u>wen</u> sie t liebt?
      which   man   believe you who she loves
      Which man do you think she loves?

(145)
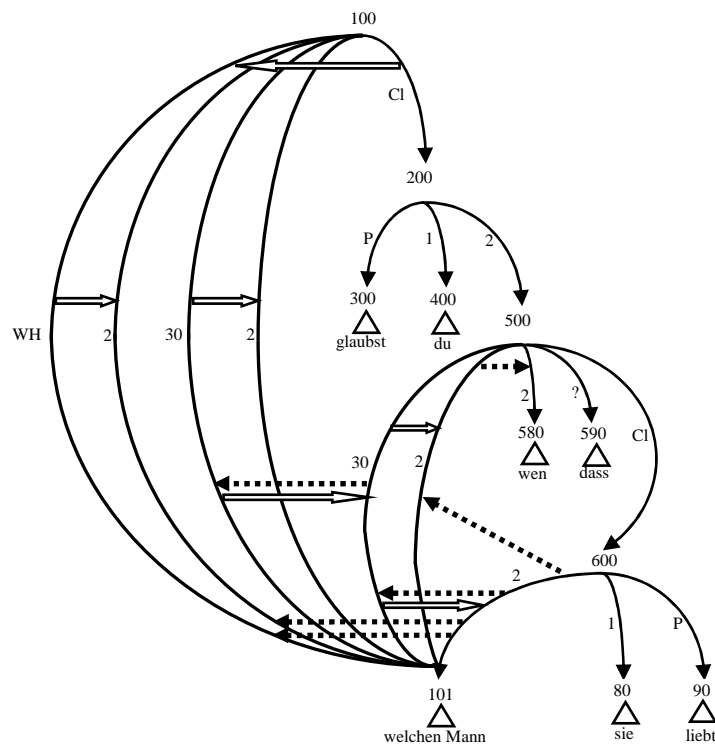
This is so because neither the definition of Replace nor the laws regulating Replace put any constraints on the morphological status of the replacee. In other words, the replacee can be either complex as in (145) or not, as in (135). But importantly, the complexity of the replacee has no consequence on the status of replacer arc H: this arc is always a Pro arc, and therefore headed by a proform.

The third virtue of this analysis is that it can readily deal with wh-copying in *structures with multiple embeddings*. On the one hand, it can deal with the very fact that wh-copying is available in these contexts in general, that is, it has not trouble in accounting for data such as (146).

(146) **Wen** glaubst du <u>wen</u> Peter meint <u>wen</u> Maria t liebt?
      who believe you who Peter means who Maria   loves
      Who do you think Peter believes Maria loves?

As each embedded clause is defined by some Cl-arc, each such Cl-arc has neighboring 30-arcs and relational markers accompanying them. Therefore, the Wh-Copying Rule has to be satisfied by the presence of a resuming element. This is illustrated in (147) for (146).

(147)
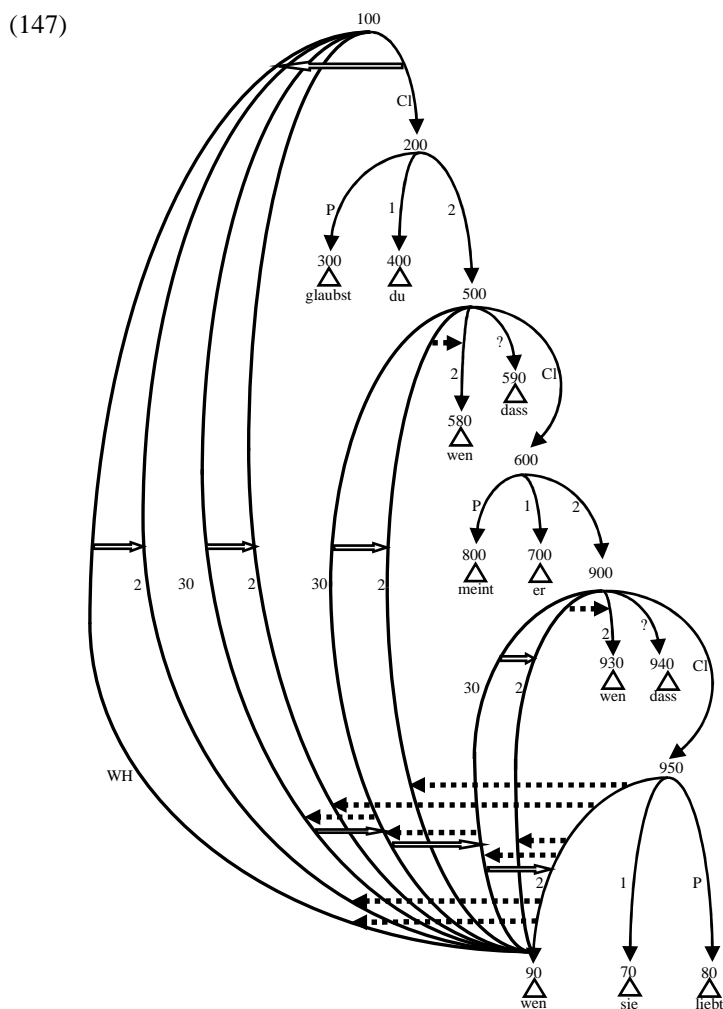
What is relevant here are the arcs C and F. As can be easily verified each of them is permitted by the same mechanism that also permits arc H in (135) and (145), viz. the Wh-Copying Rule. On the other hand, this analysis can also account for the observation that in cases of multiple embeddings the shape of the resuming element can differ, as shown in (148).

(148) a. **Wen** glaubst du   wen Peter meint den Maria t liebt?
      b. **Wen** glaubst du   den Peter meint wen Maria t liebt?
        who believe you who Peter means who Maria   loves
        Who do you think Peter believes Maria loves?

The reason for this is that the Wh-Copying Rule licences each replacer arc separately. As a consequence, nothing disallows that each replacer is headed by a separate proform, as illustrated in (149).

(149)
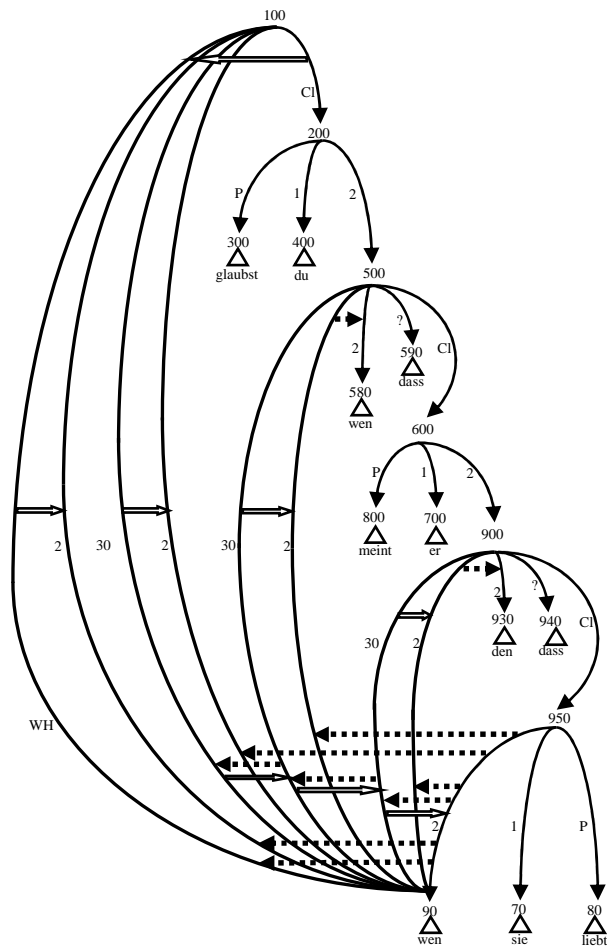
Here, arcs C and F are headed by *wen* and *den*, respectively, in contrast to the structure in (147), where both arcs are headed by *wen*. The Wh-Copying Rule is satisfied by both structures, as desired.

The fourth virtue of this rule is that given its liberal formulation, it is predicted that wh-copying-like structures should appear *in extraction contexts in general*, and not only in cases of wh-question extraction because extractions in general satisfy the antecedent clause of rule (136), viz. 30-arcs and relational markers. This prediction is in fact borne out: wh-copying is also fine in relative clauses and topicalization structures[55].

(150) a. Ich habe den Mann gesehen **den** du   denkst <u>den</u> Maria t liebt.
           I   have the man   seen   who you think   who Maria   loves
           I have seen the man that you think Maria loves.
       b. Den Mann, **den** denk ich <u>den</u> sollten wir t einstellen.
           the man   who think I   who should we   hire
           This man I think we should hire.

The fifth virtue is that the rule in (136) guarantees that the replacer, and therefore the resuming element, is permitted *only in intermediate position*. Consider why. No replacer is permitted in the position of the extracted element because although this element is headed by a 30-arc, it is headed by the wrong type of 30-arc. The rule in (136) restricts the relevant 30-arcs to mediators, that is, to 30-arcs that sponsor another 30-arc. But since the highest 30-arc does not sponsor another 30-arc, it is not a mediator and therefore it does not permit a replacer. In addition, no replacer is permitted in the base position of the extracted element because this position does not contain a 30-arc to start with: 30-arcs must be neighbors of Cl-arcs, whereas the arc in the base position must not be a neighbor of a Cl-arc[56]. As a consequence of this,

---

[55] This is so at least for many speakers. Some speakers however do not accept wh-copying in contexts other than wh-question extraction. For these speakers, the rule sanctioning wh-copying must be restricted to contexts with wh-question extraction. The following formulation achieves this.
(i) *Wh-Copying Rule German Beta*
     Rel-Marker (B,A) $\wedge$ WH-Mediator (A) $\rightarrow$ $\exists$C (Replace (C,B))
The notion WH-mediator is defined in (ii).
(ii) Def.: *WH-Mediator*
     WH-Mediator (A) $\leftrightarrow$ Mediator (A) $\wedge$ $\exists$B$\exists$C (WH-Arc (B) $\wedge$ Starter (C) $\wedge$ R-Successor (A,C) $\wedge$ Successor (B,C))
The rule in (i) therefore demands the presnece replacers only if these are neighbors of mediators that are part of a wh-question extraction.
[56] The rule in (136) guarantees that replacers occur in intermediate position only, simply because it requires so. In other words, the presence of a resuming element in intermediate position follows from no other law or rule. This is at first unsatisfactory because then the rule in (136) has a construction specific flavor. Although true, this appearance is deceptive. For rules restricting the appearance of proforms to specific constructions are needed in any event for every language. Without going into much detail, the reason for this is that the definition of Replace only restricts the contexts where a Pro arc *can* appear, but it is silent about where a Pro arc *must* appear or whether a Pro arc appears *at all*. In order to deal with the actual distribution of proforms found in natural languages, that is, in order to deal with the fact that languages require Pro arcs in certain contexts and generally do not have optional proform across the board, language particular rules are needed. Consequently, every language needs rules that restrict the appearances of Pro arcs in addition to Replace. For example, whereas English forbids the presence of proforms in object deletion contexts, Greek requires it.

the rule in (136) also guarantees that *the resuming element occupies a clause left peripheral position*, that is, the first secondary property is also captured. This is so because occupying a clause left peripheral position amounts to occupying the position dedicated to extracted elements. Since the resuming element is permitted in a position where it is a neighbor of a Cl-arc, and since this is the position dedicated to extracted elements, it follows that the extracted element occupies this position.

The sixth virtue of the rule in (136) is that it accounts for the observation that *the resuming element, although a proform, is not sensitive to antipronominal contexts*. The term 'antipronominal context' was introduced by Postal 1994a (building on work by Perlmutter (cf. Perlmutter 1972)) for contexts that accept nominal constituents with a lexical noun, but that do not accept pronouns. Three such contexts from German are illustrated in (151).

(151) a. Er muss √**diesen Weg**/*****ihn** nehmen.
      he must   that   route him take.
      He has to take that route/it.
    b. Der Wagen erreicht √**200km/h**/*****sie**.
      the vehicle reaches   200km/h   them.
      The car reaches 125mph/them.
    c. Er wartet √**ein Jahr**/*****es** darauf.
      He waited a week/it for that.

In order to capture these effects, one has to state somehow in the grammar of German that the predicate-arc terminating in *warten* does not permit neighboring Dur(ational)-arc whose POS-arc is headed by members of the set of Inexplicit, that is, O or UN. Similarly, the predicate-arc terminating in *nehmen* does not permit a neighboring Loc(ational)-arc terminating in O or UN, and the predicate-arc terminating in *erreichen* does not permit a neighboring Ext(ension)-arc terminating in O or UN. Interestingly, the resuming element does not induce an antipronominal context for the predicates, as the sentences in (151) show, despite the fact that the resuming element is a proform.

(152) a. **Welchen Weg** glauben Sie <u>den</u>   der Verdächtige t genommen hat?
       which   way believe you which the suspect   taken   has
       Which way do you think the suspect took?
    b. **Welche Geschwindigkeit** glauben Sie <u>die</u>   ein Ferrari locker t erreichen kann?
       which   speed   believe you which a Ferrari loosely reach   can
       Which speed do you think a Ferrari can reach easily?
    c. **Wieviele Tage** glauben Sie <u>die</u>   er t gewartet hat?
       how.many days believe you which he waited has
       How many days do you think he waited?

(i) a. Mary is pretty to look at (*****her**).

                              (Lasnik & Fiengo 1974, ex. 1')

   b. I   María íne ómorfi   na *(**tin**) kitás.
      the Maria is beautiful to   her look.at
      Maria is beautiful to look at.

                              (Alexopoulou 2006, ex. 6a)

So, although the rule permitting Pro arcs in wh-copying contexts is language specific, such rules are independently motivated.

The contrast between the sentences (151) and the ones in (152) is however predicted under the analysis developed so far. For although the resuming element is a replacer arc terminating in O or UN, this replacer arc is not a neighboring arc to the predicates that forbid arcs terminating in O or UN. This is so because the replacer arc defining the resuming element is only a neighbor of a relational marker. But relational markers are never neighbors of a predicate-arc. Consequently, the resuming element does not violate the constraints for these predicates, as it is defined only for arcs terminating in O or UN that are also neighbors of the relevant predicate-arcs.

There is yet a seventh virtue of the rule in (136), viz. that it accounts for the final position of the verb internal to the clause containing the resuming element. I postpone the discussion of this virtue to section 3 of the next chapter 7 because it requires some additional analyses discussed there that for reasons of space I don't want to discuss here as well.

6.5.5 Conclusion

In this section, I have shown that the first primary property of the resuming element, viz. its status as a proform, poses no problem under an APG analysis. The reason it poses no problem relates to the treatment of proforms and extraction in APG. For in APG, proforms are permitted in a structural context that is inter alia created by extraction. Under this perspective, the presence of a proform in wh-copying is simply a reflex of the extraction of a wh-element. What I have additionally shown is that only one rule is needed to guarantee the presence of the resuming element, and that this rule captures a number of other features of wh-copying, most importantly the first secondary property of the resuming element, viz. its position.

6.6   The APG Analysis for Agreement regarding Case, Adpositions, and Adverbs

6.6.1 Introduction

In this section, I develop an analysis for the second primary property of the resuming element, viz. the agreement restrictions regulating the distribution of case, adposition, and adverbs. I argued in the previous chapter that the extracted element and the resuming element have to agree for case and preposition, and that if the resuming element is an adverb, then the extracted element can be a PP. I show in this section is that these agreement restrictions are a consequence of the fact that the resuming element and the extracted element are *relationally equivalent*, that is, that they bear the same grammatical relation. Since it is grammatical relations that sanction and regulate case and adpositional marking as well as the presence of

adverbs, the agreement effects between the extracted element and the resuming element subsumed under the second primary property follow from the relational equivalence between the extracted element and the resuming element.

The section is organized as follows. In section 6.2, I present the analysis for case and adpositional marking, which latter marking subsumes prepositional marking as a special case. In section 6.3, I show how this analysis accounts for the agreement effects for case and prepositions between the extracted element and the resuming element. In the last section 6.4, I deal with and show that their availability as resuming elements for extracted elements that are PPs is due to the same reason why the extracted element and the resuming element agree for case and preposition.

6.6.2 The APG Analysis for Case and Adpositional Marking

6.6.2.1 General Remarks

My APG treatment of case and adpositional marking is based on two ideas. The first idea is that both case affixes and adpositions serve the same purpose, viz. that of being surface markers for grammatical relations (cf. Johnson & Postal 1980, ch. 13, especially section 5; Postal 2010, p. 98). The second idea is that – given the functional similarity between case affixes and adpositions – both case and adpositional marking structures are represented in the same way (cf. Johnson & Postal 1980, p. 622). Although the former idea is rather uncontroversial, the second idea has been subject to massive criticism (cf. Jackendoff 1973; van Riemsdijk 1978). I nevertheless stick to this idea. I return to this criticism in the next chapter and provide empirical evidence from a number of languages that shows that a uniform treatment of case and adpositional marking is well-justified and that the criticism leveled against such a treatment is unwarranted. In addition to this, the APG analysis I develop in this chapter differs to a considerable extent from already existing APG analyses for case and adpositional marking (Johnson & Postal 1980, ch. 13; Postal 2010, pp. 97-102). I return to these differences in the next chapter and show that the analysis developed here is superior both from an empirical and theoretical point of view.

A successful analysis of case and adpositional marking needs to deal with three issues. The first is a specification of the general structure defining case and adpositional marking. The second is a specification of the conditions that sanctions the presence of such structures. The final issue is a specification of the conditions that determine the choice of a specific case affix or adposition. I first deal with the overall structure of case and adpositional marking, then turn to the conditions regulating the presence of these structures, and finally deal with the conditions regulating specific case affixes and adpositions.

6.6.2.2 The General Structure for Case and Adpositional Marking

The general structure for case and adpositional marking is shown in (153).

(153)
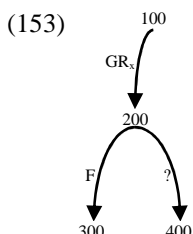
This structure is similar to the structure adopted by phrase structure grammars for adpositional marking. More specifically, there is a constituent (in this case, the constituent defined by the node labeled 200) bearing some grammatical relation (in this case, GR_x) which consists of two other constituents (in this case, the ones defined by the nodes labeled 300 and 400, respectively). Both constituents also bear a grammatical relation. The constituent defined by the node labeled 300 bears the F-relation, where F is an abbreviation for *flag*. Flags are a type of arc, viz. those arcs that are headed by case affixes and adpositions. The other constituent bears a relation which I leave unspecified for this moment; I return to its label when I discuss the conditions regulating the presence of the general structure for case and adpositional marking. This latter constituent contains the nominal to which the flag belongs. Some concrete examples of such structures are provided in (154)-(156).

(154)   (155)   (156)
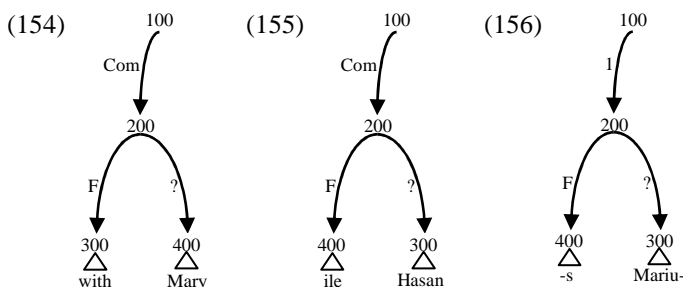
The structure in (154) is an example for a structure with adpositional marking, and more specifically, with prepositional marking. This structure corresponds to a constituent that expresses a comitative relation, as in the sentence *Mary dances **with John***. The structure in (155) contains another example for adpositional marking, but in this case with postpositional marking. This structure corresponds to a constituent expressing the comitative relation in Turkish, as in the sentence *Konsere **Hasan ile** gittim* (Engl. I went to the concert with Hasan). The last structure in (156) is an example of case marking, and more specifically, to suffixal case marking[57]. The

---

[57] Although case marking tends to be suffixal typologically, prefixal case marking is attested as well; I return to this issue in chapter 7, section 4.

structure corresponds to a constituent expressing the subject relation in Latin, as in **Marius** *currit* (Engl. Marius walks). Treating case affixes and adpositions as elements bearing a grammatical relation and not as a part of speech, viz. adposition and affix, respectively, leads to the question what part of speech arcs F-arcs need to support. For these elements are ultimately also subject to the Basic-Arc Branch Law stated in (4). The answer I propose is that F-arcs are restricted to particles, which the following law guarantees.

(157) *The F-Arc Law*
       F-Arc (A) ∧ Branch (B,A) → Prt-Arc (B)

According to this law, flags are restricted to particles as part of speech. The modified structures for the example (154)-(156) incorporating this difference are given in (158)-(160).
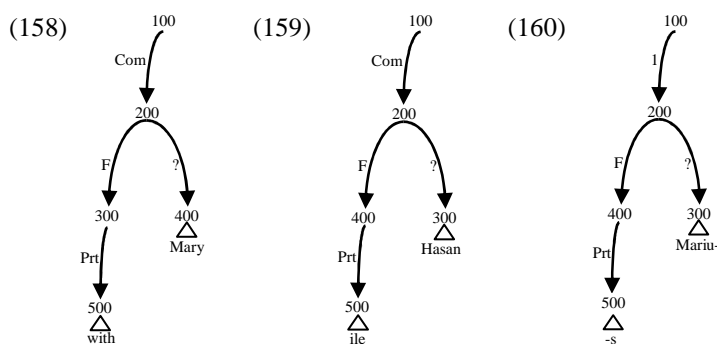
The difference between adpositions and case affixes is then simply whether these particles are *bound* or *free*. If the particle is bound, then it is a case affix; if the particle is free, then it is an adposition. This analysis is reflected in the terminology I adopt hereafter. Instead of talking about case and/or adpositional marking structures I refer from now to both structures uniformly as *flagging structures*. The difference between pre- and postpositions on the one hand, and suffixal and prefixal case affixes on the other hand is a matter of rules, that is, of language particular statements. More specifically, it is a matter of rules regulating the assignment of node labels to the F-arc. As I mentioned in chapter 5, it is head node labels that determine the ordering between the constituents defined by that labels. If the language requires the F-arc's head node label to be greater than the head node label of its neighboring arc, then the language has postpositions or case suffixes, which choice is dependent on whether the particle is free or bound. But if it is the other way round, then the language has prepositions or case prefixes, again, with the latter choice depending on whether the particle is free or bound. To see how this works, consider again the structure in (159). The F-arc's head is labeled 400, whereas its colimb's head label is 300. Since linear order is read off a structure according to the greater-than relation holding between the labels of head nodes between neighboring arcs, the adposition follows the nominal. The reverse situation is found in the structure (158).

This uniform treatment of case affixes and adpositions as flags seems to face a problem with the observation that case affixes often[58] appear not only once on a constituent but also at elements within this constituent, as for example in Latin, where case is expressed on the article, the adjective, and head noun of a nominal constituent, as illustrated in (161).

(161) h**ic** clar**us**   patrici**us** Roman**us**
         this famous patrician Roman
         this famous Roman patrician

However, I partly follow Mel'čuk 2006, p. 110, and distinguish *governed case* from *agreeing case*. With the first concept, I refer to the syntactic side of case marking, viz. that some constituent is assigned a case. With the second concept, I refer to the morphological side of case marking, viz. how this case assignment affects the realization of the constituent to which case was assigned. In the Latin example, the whole constituent bears one governed case. This case is nominative case. In addition to this, it contains four instances of agreeing case, viz. on the demonstrative pronoun *hic*, on the adjectives *clarus* and *Romanus*, and on the head noun *patricius*. What is of relevance for my analysis to case marking is the concept of governed case, that is, the syntactic side of case marking, and I have nothing to say in this work on agreeing case, that is, on the morphological aspect of case marking[59].

Returning to the structures for flagging structures, the formulation of the law in (157) guarantees not only that flags are restricted to particles, it also has the desirable result of excluding structures that are unattested, viz. ones containing adpositions or case affixes accompanied by articles or modifiers of any kind, be it adjectives or relative clauses. In other words, the following structure is excluded.
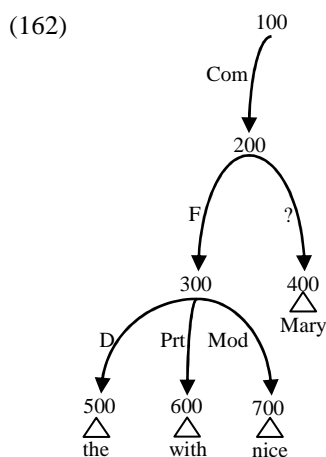
(162)

This structure is excluded because there are two branches of the F-arc that are not Prt-arcs, viz. the D- and the Mod-arc, therefore violating the F-Arc Law. Since D- and Mod-arcs are only permitted as neighbors of POS-arcs, to which the Prt-arc belongs, such arcs can never appear internal to some flag.

All flagging structures dealt with so far involve a single flag, that is either one case affix or one adposition. But case affixes and adpositions can also cooccur, that is, a constituent can also be multiply flagged. This is illustrated in (163) with two examples from German.

(163) a. Maria tanzt   mit dem   Mann.
          Maria dances with the.DAT man
          Maria dances with the man.
      b. Maria geht an den   Tisch.
          Maria goes on the.ACC table
          Maria goes to the table.

(163a) contains a constituent bearing the comitative relation. Importantly, the nominal is not only marked by the preposition *mit* (Engl. with), it is also marked by the dative case, as indicated by the form of the article. (163b) contains a nominal bearing the directional relation. Again, the nominal is not only marked by a preposition, in this case *an*, but also by the accusative case, showing up overtly on the article. It is at first sight unclear how such examples with multiple flagging can be subsumed under the general format for flagging structures illustrated in (153). For this general structure permits only one flag, that is, either a case affix or an adposition. An easy possibility to deal with multiply flagged constituents is to give up precisely this idea and allow more than one flag. The relevant constituents in (163a) and (163b) would then be assigned the structures in (164) and (165), respectively.
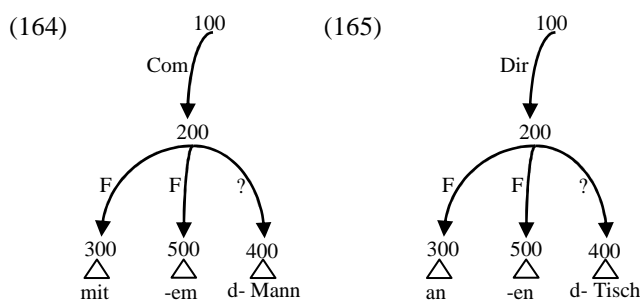
However, I reject this possibility and suggest an analysis that relies only on the general structure in (153) and is nevertheless compatible with instances of simultaneous marking by both case affixes and adpositions. I postpone specifying this structure to the end of this section because setting up this analysis requires an understanding of the other issues mentioned earlier, viz. the specification of the conditions regulating the presence of case and adpositional marking structures and the specification of the conditions regulating the choice of specific flags.

6.6.2.3   Restrictions on Case and Adpositional Marking Structures

As remarked at the beginning of this subsection, flags and flagging structures in general are surface phenomena. In other words, the presence of flagging structures is restricted to S-Graphs, that is, such structures can only occur in S-Graphs. Consequently, every constituent is originally a bare arc. This means that the constituent *with Mary*, whose structure was already given in (154) and which is repeated in (166), looks originally as in (167).

(166)   100   (167)   100

      Com   Com

          200

      F   ?

   300   400   400
    △   △   △
  with   Mary   Mary
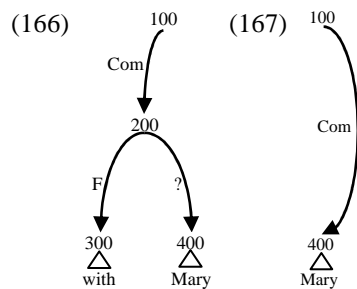
Since both these structures are ultimately part of a single structure, viz. of an R-Graph, the question that arises is how the two structures are jointly expressed in a single R-Graph. The answer is that the R-Graph comprising both structures looks as in (168).

(168)   100

      Com

          200   Com

      F   ?

   300   400
    △   △
  with   Mary
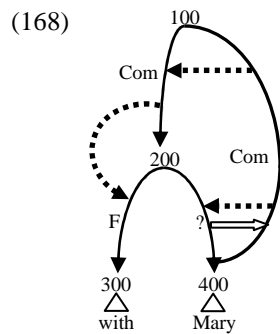
As can be seen, the bare arc B sponsors a neighboring equivalent graft C and a non-equivalent F-successor A such that (i) A is a branch of C and (ii) A erases B. Moreover, the flag D is sponsored by arc C. The next question that arises is how to express the connection between the two structures, and more specifically, the Sponsor and Erase pairings. Given the concept of Replace introduced in the previous section, it is possible to accommodate the majority of the Sponsor and Erase pairings present in (168). More specifically, the relation between the three arcs A, B, and C is an instance of *Replace-II*. In order to understand how the structure in (168) can be partially subsumed under Replace-II, consider the definition of Replace-II formulated in (87) and repeated here in (169).

(169) Def.: *Replace-II*
Replace-II (C,B) ↔ Replace (C,B) ∧ ∀A (Second (A,C) → Branch (A,C))

Replace-II differs from Replace-I with respect to the connection between the seconder and replacer in that the seconder is a branch of the replacer. In other words, Replace-II is satisfied by the general structure given in (170).

(170)
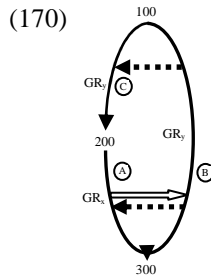
The similarities between the structures in (170) and (168) are obvious: there are three arcs A, B, C such that (i) A and B overlap, (ii) B and C are neighbors, (iii) A is a branch of C, (iv) A erases B, (v) B sponsors C, and (vi) B and C are equivalent. Consequently, the arc specifying the relation of the constituent marked by a flag is nothing but a replacer to the original, unmarked arc. In other words, in the structure in (168), C is a replacer for B. Therefore, C and B are equivalent, as required by the Replace Equivalence Law in (61), repeated here as (171).

(171) *The Replace Equivalence Law*
Replace (A, B) → Equivalent (A,B)

It is convenient for later purposes to be able to refer to each of the three arcs in (170). This is accomplished by the definitions in (172)-(174).

(172) Def.: *Closure Arc*
Closure Arc (A) ↔ Replacer (A) ∧ ∃B (Replace-II (A,B))

(173) Def.: *Pioneer*
Pioneer (A) ↔ Seconder (A) ∧ ∃B (Closure Arc (B) ∧ Branch (A,B))

(174) Def. *Dispatcher*
Dispatcher (A) ↔ ∃B (Replace-II (B,C))

So, in (168) and (170), arc C is a closure, arc A is a pioneer, and arc B is a dispatcher. The next two laws ensure that the pioneer is sponsored by the dispatcher and that the flag is sponsored by the closure.

(175) *The Pioneer Sponsor Law*
Pioneer (A) → ∃B (Dispatcher (B) ∧ Successor (A,B))

(176) *The Flag Sponsor Law*[60]
      F-Arc (A) → ∃B (Closure Arc (B) ∧ Branch (A,B) ∧ Sponsor (B,A) ∧
      ¬Branch (B,A))

The Pioneer Sponsor Law first guarantees that every pioneer is sponsored. In that
respect, it differs from Replace-I because there the seconder is not always sponsored
but can also be an initial arc. The Pioneer Sponsor Law secondly restricts the
sponsor to the arc that the pioneer erases, viz. to the dispatcher. The Flag Sponsor
Law on the other hand guarantees that a flag is always sponsored by the closure arc
of which it is a branch. The condition that the closure is not a branch of the flag is
needed to exclude bizarre structures such as (177).

(177)
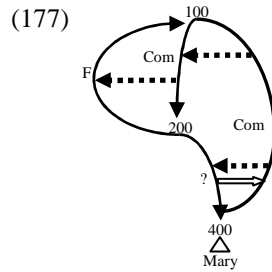
In (177), the closure *is* a branch of the flag, thereby violating the Flag Sponsor Law.
The next two important laws are formulated in (178) and (179).

(178) *The Flag UN Law*
      F-Arc (A) → ∀B (R-Branch (B,A) ∧ L-arc (B) → UN (Head,B))

(179) *The Flag Uniqueness Law*
      F-Arc (A) ∧ F-arc (B) ∧ Neighbor (A,B) → A = B

The first law states that F-arcs carry no inherent meaning, similar to D-arcs and
proforms. The other law says that a flagging structure contains at most one arc,
thereby excluding structures such as (164) and (165).
To complete the structure in (168), one needs to specify the label of the pioneer. In
previous APG analyses for flagging, it was assumed that pioneers bear a unique
label, viz. *Marq* (Johnson & Postal 1980, p. 603, 605) or *60* (Postal 2010, pp. 97-8).
I deviate from this assumption, however, and assume a more flexible labeling for the
pioneer. More specifically, I assume that the pioneer can bear any label of the set of
argumental R-signs. This is guaranteed by the following law.

(180) *The Pioneer Labeling Law*
      Pioneer (A) → Argument RS-Arc (A)

---

[60] This formulation is compatible with closure arcs lacking F-arc branches altogether, and therefore with
languages in which not every grammatical relation is related to a flag, as for example in isolating
languages.

Which label is chosen for which pioneer is then a language particular issue; I return to the consequences of this analysis presently, and for the time being, I simply use *Arg* as a cover symbol for any of the argumental R-signs permitted by the Pioneer Labeling Law. The modified complete version of the structure in (168) is (181).

(181)
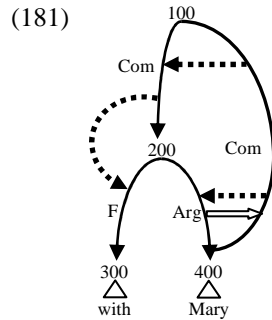
In connection to the Basic-Arc Branch Law, I pointed out that this law needs to be revised in order to guarantee compatibility with flagging structures. This is required because flagging structures so far violate this law, which is repeated in (182).

(182) *The Basic-Arc Branch Law (First Version)*
        Basic-Arc (A) → Branch (B,A) ∧ POS-Arc (B)

The reason why flagging structures violate this law is that closure arcs are basic-arcs, but do not support a POS-arc. Instead, they sponsor two arcs neither of which bears a POS R-sign but either an argumental R-sign (the pioneer) or a non-argumental R-sign (the flag). In order to achieve compatibility, the law needs to be given a revised formulation, as in (183).

(183) *The Basic-Arc Branch Law (Final Version)*
        Basic-Arc (A) ∧ ¬Closure Arc (A) →Branch (B,A) ∧ POS-Arc (B)

This revised version is compatible because it excludes closure arcs from its domain.

6.6.2.4 The Determination of Flagging Structures

The discussion so far has centered on general aspects of case and adpositional marking structures. A full account of such structures must however also deal with the specific instances of this structure as they are found in natural languages. More specifically, although case marking structures in German share the same overall structure with the prepositional marking structures, each specific flagging structure differs from the other in two respects. First, and most obviously, each specific instance of a flagging structure differs from the other with respect to the choice of the flag. For example, the two prepositional marking structures in (187) differ from

each other in that the one contains the preposition *an* as a flag, whereas the other contains the preposition *mit* as a flag. Secondly, the specific instances of flagging structures are not equivalent to each other. For example, the prepositions *an* und *mit* from example (163) cannot be used interchangeably, cf. (184).

(184) a. Maria tanzt   mit dem   Mann.
             Maria dances with the.DAT man
             Maria dances with the man.
         b.* Maria tanzt   an den   Mann.
             Maria dances on the.ACC man
             intended meaning: *Maria dances with the man.*
         c. Maria geht an den   Tisch.
             Maria goes on the.ACC table
             Maria goes to the table.
         d.* Maria geht mit dem   Tisch.
             Maria goes with the.DAT table
             intended meaning: *Maria goes to the table.*

Similarly, case marked constituents are not equivalent either; cf. (185).

(185) Ich habe dem   Direktor den   Schüler vorgestellt.
       I   have the.DAT director the.ACC student introduced
       √ *I have introduced the student to the director.*
       * *I have introduced the director to the student.*

The claim I want to make regarding the appropriate choice of a flagging structure is that *grammatical relations determine the shape of flagging structures*. The two differences between specific instances of flagging structures are then two sides of the same coin. The reason why flagging structures differ in their shape is because each grammatical relation specifies its own specific flag. And the reason why different flagging structures are not equivalent is because they bear different grammatical relations. The contrasts in (184) and (185) are then easily accounted for. The reason why (184b) is not equivalent to the one in (184a) is because directionals require marking by the preposition *an* in German, and not by the preposition *mit*. And that (184d) is not equivalent to (184c) is because comitatives require marking by the preposition *mit* in German, and not by the preposition *an*. Similarly, accusative case is reserved for direct and not for indirect objects, whereas dative case is reserved for indirect objects and not for direct objects, thereby accounting for the contrasts in (185).

The idea that grammatical relations determine the shape of flagging structures is formally encoded via language particular rules. Reference to language particular statements is needed because although grammatical relations generally determine specific instances of flagging structure, the actual shape of the flag in such a structure is of course ultimately a language particular issue. To put it differently, that directionals require a flagging structure is universal, but that directionals determine the flag *an* is certainly not universal, but a feature specific to German. The rules of

German specifying the presence of the preposition *an*, the preposition *mit*, and the case suffixes for accusative and dative look as follows.

(186) *German Directional Rule (First Version)*
       Dir-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ↔ F-Arc (B) ∧ PH-Headed (B,an)

(187) *German Comitative Rule (First Version)*
       Com-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ↔ F-Arc (B) ∧ PH-Headed (B,mit)

(188) *German 2-Arc Rule (First Version)*
       2-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ↔ F-Arc (B) ∧ PH-Headed (B,-en)

(189) *German 3-Arc Rule (First Version)*
       3-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ↔ F-Arc (B) ∧ PH-Headed (B,-em)

All rules mention a predicate undefined so far, viz. *PH-headed*. This predicate relates any basic-arc that is not a closure arc to the head of the PH-arc it R-supports. Or to put it informally, it specifies for any constituent the phonological content of the head of the constituent. The formal definition is provided in (190).

(190) Def.: *PH-Headed*
       PH-Headed (A, a) ↔ ∃B∃C∃D (Branch (B,A) ∧ POS-Arc (B) ∧ Branch (C,B) ∧
       Stem-Arc (C) ∧ Branch (D,C) ∧ PH-Arc (D) ∧ Phonological Node (a, D))

For example, in the structure (37), repeated here are (191), PH-headed relates the 2-arc to the phonological representation /biːə/.

(191)
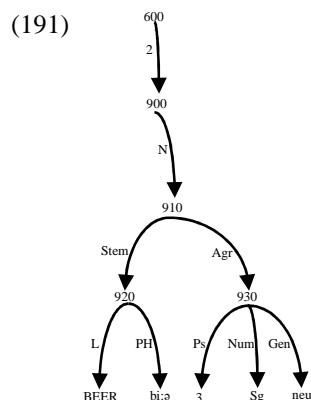
Returning to rules stated in (186)-(189), they determine that a closure arc bearing a specific label must have a flag that is PH-headed by some relevant phonological representation, and vice versa. The structures for the directional *an den Tisch* (Engl. to the table), the comitative *mit dem Mann* (Engl. with the man), the direct object *den Schüler* (Engl. the student), and the indirect object *dem Mann* (Engl. the man) are provided in (192)-(195).

(192)   Dir   (193)   Com   (194)   2   (195)   3

100   100   100   100

Dir   Com   2   3

200   200   200   200

F   Arg   F   Arg   F   Arg   F   Arg

300   400   300   400   300   400   300   400

Prt   den Tisch   Prt   dem Mann   Prt   d- Schüler   Prt   d- Mann

500   500   500   500

Ste   Stem   Stem   Ste

600   600   600   600

L   P   L   PH   L   PH   L   P

UN   /an/   UN   /mit/   UN   /-en/   UN   /-em/
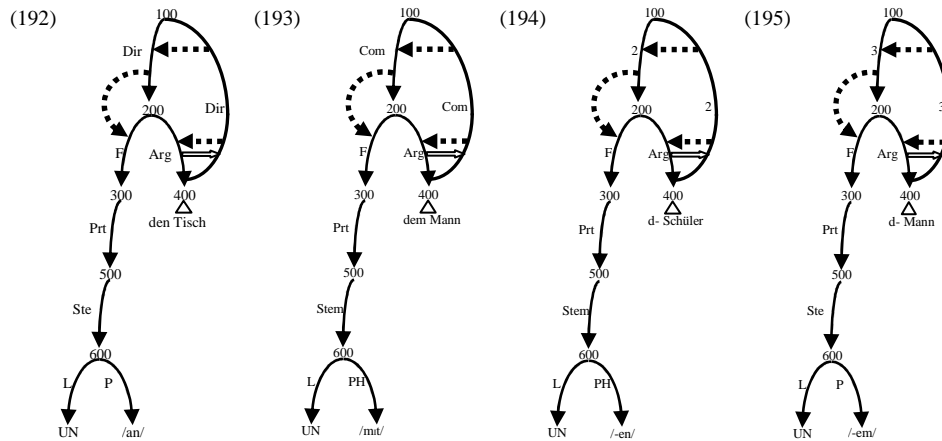
This analysis for the determination of flagging structures based on grammatical relations needs to be refined, however. For a constituent can bear more than one relation in sentence. Nevertheless, one does not want all the grammatical relations a constituent bears to ultimately determine a flagging structure. For example, in the case of unaccusatives, it is the subject relation borne by the argument selected by the unaccusative predicate that determines case marking and not the initial direct object relation, as illustrated in (196).

(196)   Der   Mann/* den   Mann stirbt.
        the.NOM man   the.ACC man   dies
        The man dies.

In order to guarantee that only one relation is relevant for the determination of a flagging structure, one has to define the relevant grammatical relation that counts for this determination. The easiest way to define this relation is to equate it with the *surface* relation a constituent bears. With respect to (196), since the subject relation is the surface relation borne by *Mann*, nominative marking and not accusative marking follows as desired. However, this approach is too simplistic because it fails for case and adpositional marking patterns in extraction contexts. Consider the constituent question corresponding to (196), shown in (197).

(197)   Welcher   Mann/*welchen   Mann t stirbt?
        which.NOM man   which.ACC man   dies
        Which man dies?

Under the approach to extraction presented in the previous section, extractions are modelled via special relations, that is, via special arcs, viz. overlay-arcs. This implies that the surface relation borne by the constituent *welcher Mann* in (221) is not the subject relation, but some overlay relation. This however doesn't affect case marking, that is, the extracted constituent still bears nominative case. But if the subject relation in (196) counts as the relation relevant for the determination of case

marking because it is the surface relation, why then does it still count as the relevant relation in (197), even though it is not the surface relation borne the constituent? Obviously then, case marking is not guided by the surface relation a constituent bears. This conclusion is valid for adpositional marking, too. Consider peculiar cases of subject-to-object raising, as described in Postal 2004, ch. 2, illustrated in (198).

(198)   You can depend on him/*he to do something decent.

In (198), the constituent corresponding to the subject of the embedded clause is raised to an object position in the matrix clause, which object relation Postal 2004, p. 107, coins '10' and which is marked by the preposition *on* in English. As expected, since the surface relation this constituent bears is '10', nominative case marking is no longer available, and marking by the preposition *on* occurs. However, also in this case, it is not the fact that the 10-relation is the surface relation borne by this constituent that is responsible for the prepositional marking. Because in the corresponding constituent question to (198), illustrated in (199), the prepositional marking is retained.

(199)   On whom can you depend t to do something decent?

Importantly, the 10-relation is not the surface relation the constituent bears. The surface relation it bears is again some overlay relation. Nevertheless, the marking of the constituent is again not affected by this and it is still marked by the preposition *on*. So again, if the 10-relation in (198) counts as the relation relevant for the determination of prepositional marking because it is the surface relation, why then does it still count as the relevant relation in (199), even though it is not the surface relation borne by the constituent? Again, flagging, in this case by an adposition, is not determined by the surface relation. The same behavior can be observed in sentence instantiating control.

(200)   a. Maria bat   den   Schüler/*der   Schüler zu gehen.
            Maria asked the.ACC student   the.NOM student to go
            Maria asked the student to leave.
        b. Maria verlangte von dem   Schüler/*der   Schüler zu gehen.
            Maria desired   of the.DAT student   the.NOM student to go
            Maria desired the student to leave.

These examples are instances of object control, that is, the object of the matrix verb is at the same time the subject of the verb of the embedded clause. As can be seen, case and adpositional marking seems to be determined by the surface relation the constituents bear, viz. by their relation in the matrix clause and not by their relation in the embedded clause. More specifically, the relevant constituent *Schüler* (Engl. student) surfaces with accusative marking in (200a) because it is a surface 2-object, whereas it surfaces with the preposition *von* in (200b) because it bears the relevant relation demanding this flag, which for the time being I dub '7'. However, similar to the raising cases, any such account relying exclusively on the surface relation of the

controller element in (200) fails, as revealed by the corresponding constituent questions.

(201) a. Welchen   Schüler bat   Maria t zu gehen?
           which.ACC student asked Maria   to go
           Which student did Maria ask to leave?
       b. Von welchem   Schüler verlangte Maria t zu gehen?
           of   which.DAT student desired   Maria   to go
           Which student did Maria desire to leave?

As in the raising cases discussed before, the surface relation borne by the controllers is some overlay relations. Despite this, flagging is retained although the relation determining flagging is no longer the surface relation. The question therefore is: what are the grammatical relations relevant for the determination of flagging structures? Informally, the answer is that the relation determining flagging of a constituent is the *surface object* relation this constituent bears, irrespective of whether this surface relation is established inside the clause the constituent originally started (as in the case of unaccusatives) or outside of it (as in the case of subject-to-object raising), or whether this surface relation is an initial relation (as in the cases of control) or not (as in the cases of unaccusatives and raising). Object relations include not only the many object relations, but also subjects and adverbial relations, but that, importantly, object relations do *not* include overlay relations. Therefore overlay relations do not interfere with flagging. In order to delimit the relations determining flagging, I propose the following law.

(202) *The Closure Law*[61]
       Object-Arc (A) ∧ Shallow Arc (A) ↔ Closure Arc (A)

The Closure Law guarantees that all constituents bearing an *object* R-sign have to be closure arcs. The reason why overlay relations don't matter and why only surface object relations matter is an effect of the restriction on shallow arcs, whose definition is repeated in (203).

---

[61] Postal 2010, chapter 3, section 3, identifies output arcs as the arcs that are relevant for the determination of flagging. This analysis faces two problems though when it comes to F-erased object-arcs, as present in control and raising structures. First, since output arcs are not L-erased, the F-erased arcs in both control and raising structures are predicted to be available for flagging, contrary to fact.
(i)   a. * You can depend on he to do something decent.
      b. * Maria bat   der   Schüler zu gehen.
           Maria asked the.NOM student to go
           Maria asked the student to leave.
Second, it even allows multiple flagging because the F-erasers themselves are also output arcs, resulting in both nominative and accusative marking for the relevant elements, again contrary to fact.
(ii) a. * You can depend on he-m to do something decent.
      b. * Maria bat   der-en   Schüler zu gehen.
           Maria asked the.NOM-ACC   student to go
           Maria asked the student to leave.
Identifying the arcs relevant for flagging as shallow arcs creates no such problems, because the shallow arcs put an additional restriction on their F-erasers, which condition excludes the unwanted flaggings in (i) and (ii), as the discussion that follows in the main text makes sufficiently clear.

(203) Def.: *Shallow Arc*
       Shallow Arc (A) ↔ Structural-Arc (A) ∧ Output Arc (A) ∧ ∀B (F-Erase
       (B,A) → Overlay-Arc (B))

Informally speaking, the definition of shallow arc picks out from the set of erased
arcs the subset of those erased arcs that are erased by an overlay-arc. By requiring
object-arcs that are shallow arcs to be closure arcs, the Closure Law therefore
guarantees secondly that only *surface object* relations matter for the determination
of flagging structures. Thirdly, since shallow arcs are defined solely with respect to
their erasure properties, the status of the surface relation as an initial or non-initial
one is irrelevant.
I now illustrate how the Closure Law correctly accounts for the distribution of case
and adpositional marking structures, as illustrated in (196)-(201), that is, how the
Closure Law picks out all and only surface object-arcs. Consider first the simplified
structure for (196), (198), and (200) without flagging on the relevant constituents,
viz. the A arcs.
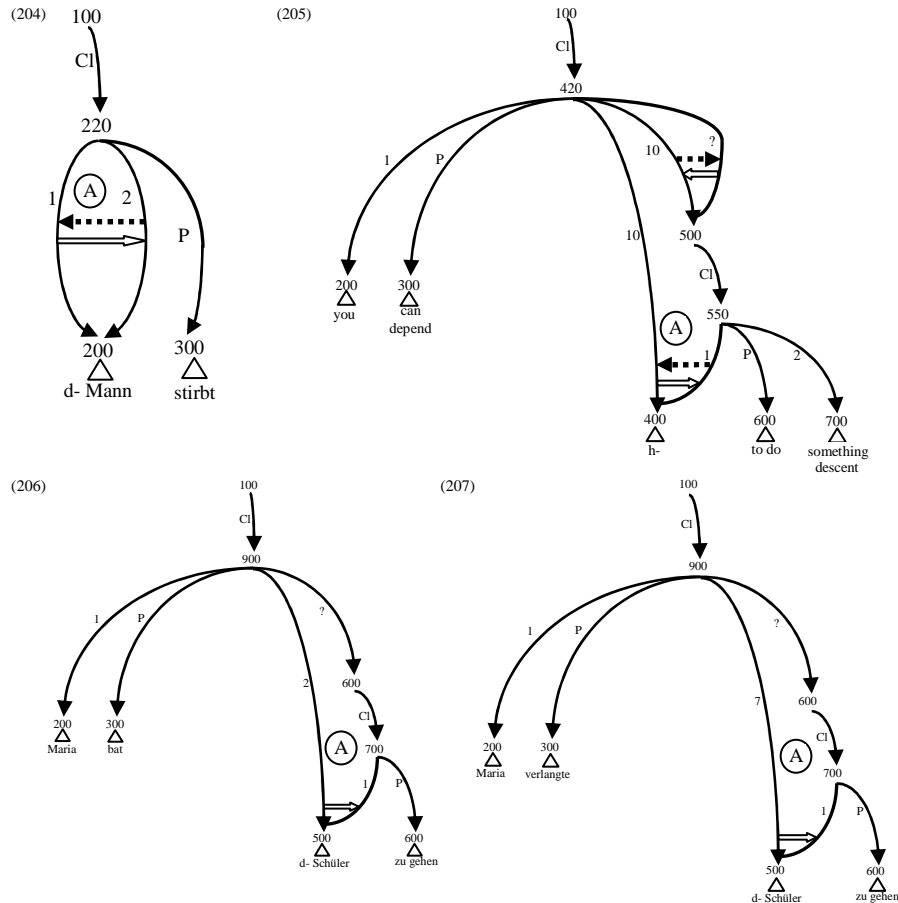
In all these structures, the A arcs violate the Closure Law: they are objects-arcs (qua R-sign), shallow arcs but not closure arcs. That they are shallow arcs follows from the definition of shallow arc: they are structural-arcs (again qua R-sign), they are output arcs (they are not L-erased), and they are not F-erased (thereby vacuously satisfying the condition on admitted F-erasers). The following structures, however, do satisfy the Closure Law.

Consider how the resulting structures satisfy the Closure Law. The A arcs now satisfy the Closure Law vacuously because although object-arcs, they are no longer shallow arcs. This is so because they violate the condition on admissible F-erasers stated in the definition of shallow arcs. This condition requires F-erasure of an overlay-arc. However, all the A arcs in (208)-(211) are erased by an argumental-arc. And these do not include overlay-arcs. Consequently, since these A arcs are not F-erased by an overlay-arc, they do not count as shallow arcs. The replacer-II versions of them, the B-arcs, however, are object-arcs, shallow arcs, and closure arcs, and therefore satisfy the Closure Law. Before turning to extraction, consider the following structures, which also satisfy the Closure Law.

(212)

100
Cl
220
1 2
A
B
210
1
300
stirbt
Arg
F
200
d- Mann
230
-er

(213)

100
Cl
420
1 P
10
?
200
you
300
can
depend
10
500
10 B
A Cl
550
1 P 2
410
600
to do
700
something
descent
Arg
F
400
him
390
on

(214)

100
Cl
900
1 P
?
200
Maria
300
bat
2
2
600
Cl
700
1 P
B A
500
600
zu
gehen
Ar
F
510
d- Schüler
511
-en

(215)

100
Cl
900
1 P
?
200
Maria
300
verlangte
7
7
600
Cl
700
1 P
B A
500
600
zu gehen
Arg
F
510
dem Schüler
509
von
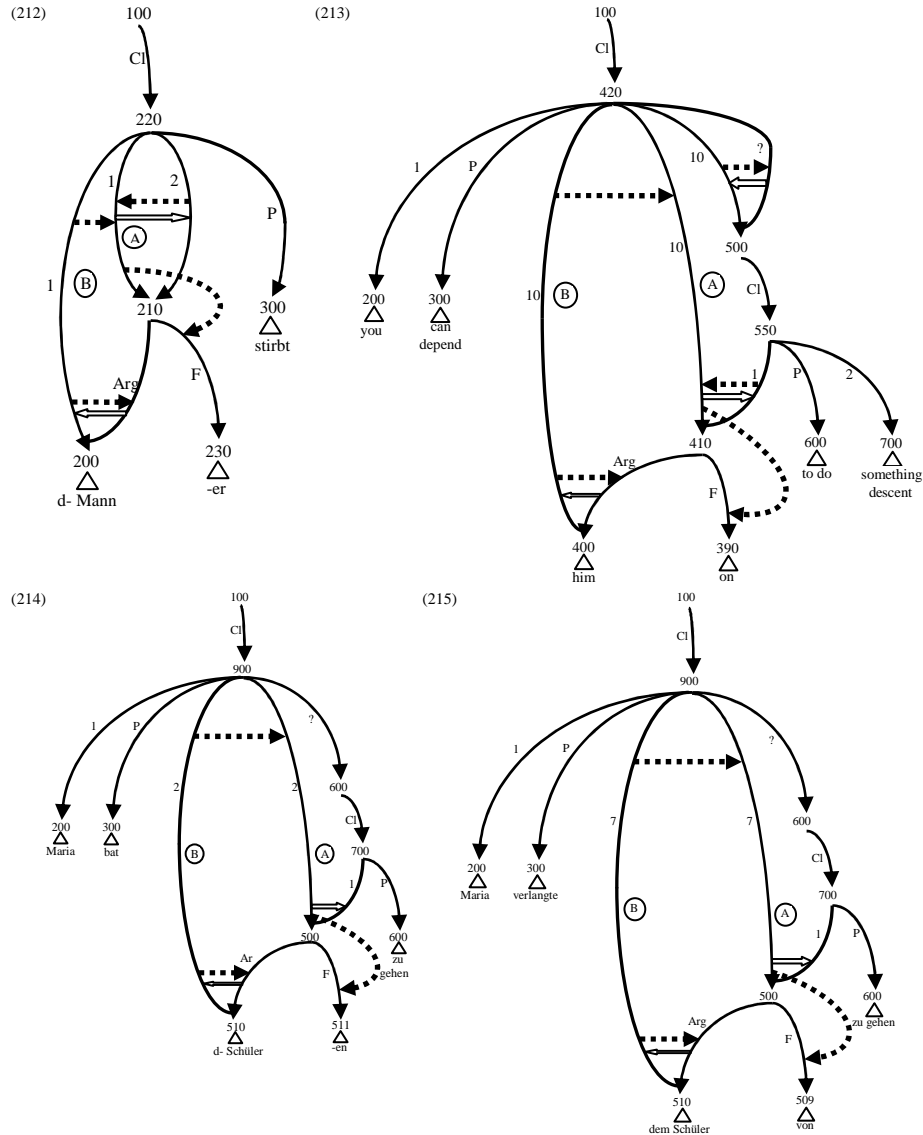
In these structures, the A arcs are not replaced-II, but rather define the output of Replace-II, that is, they are closure arcs themselves instead of being replaced by closure arcs. Importantly, the A arcs in this case satisfy the Closure Law because they are object-arcs (qua R-sign) and shallow arcs: they are structural-arcs (again qua R-sign), they are output arcs (because they are not L-erased), and they are not F-erased, thereby vacuously satisfying the condition on admissible F-erasers. Nevertheless, these structures violate independent laws. The structures in (212) and (213) are not well-formed because they have two sponsors. But the Sponsor Uniqueness Law demands every arc to have only one sponsor.

(216) *Sponsor Uniqueness*
       Sponsor (A,B) ∧ Sponsor (C,B) → A = C

The structures in (214) and (215) do not violate this law but another important one discussed in connection to the conditions regulating the presence of proforms. Closure arcs are replacers and therefore subject to the Replacer Overlap Law.

(217) *The Replacer Overlap Law*
       Replacer (A) ∧ Overlap (A,B) → R-Successor (B,A)

This law is violated in (214) and (215) because the closure arc, which is a replacer arc, overlaps an arc which is not an R-successor of it, viz. the initial 1-arc of the embedded clause. Consider now the structures for the extraction cases.

These structures still satisfy the Closure Law because the B-arcs are still shallow arcs. For although they are F-erased, they are F-erased by the right type of arcs, viz. by 30-arcs, which are overlay-arcs (cf. the previous section on extraction). For the same reason, if extraction structures were based on the unflagged versions shown in (204)-(207), the Closure Law would still be violated. Consider as an example the modified version for (218).

(222)

This structure, similar to the ones in (204)-(207), violates the Closure Law because the A arc is an object-arc (qua R-sign) and a shallow arc because it satisfies the condition on admitted F-erasers (it is F-erased by an overlay-arc, viz. a 30-arc) but the A arc does not determine a flagging structure. Or speaking more technically, it is not a closure arc.

Consider now how the Closure Law restricts flagging only to surface object relations. If this were not the case, then it would not be the A arcs that determine flagging but the arcs erased by the A arcs. But this option is immediately out. For if the erased arcs determined flagging, then the Closure Law would still be violated by the A arcs. In other words, if the erased arcs determined flagging, the resulting structures would be ungrammatical for the same reason that the structures in (204)-(207) are ungrammatical[62].

Before turning to structures with multiple flags, consider how the Closure Law determines the correct element for flagging in cases of *covert raisings*, that is, structures where some arc sponsors an overlapping arc and erases it. Or to put it technically: where some arcs has a successor-II. One such case is illustrated in (224) for (223), taken from Postal 2010, pp. 38-9[63].

---

[62] This still leaves open the possibility of having both the A arcs and the arcs they erase determine flagging. In other words, one would end up with a constituent marked by both its surface and its non-surface object relation. And although multiple flagging is not uncommon, this type of multiple is not only not attested, it is predicted to not occur by the Closure Law. I discuss this issue in more detail in section 4 of chapter 7.

[63] I return to such examples in section 2 of chapter 7, where they are called *reflexive unergatives*.

(223) Mike exerted himself.

(224) 100

The only arc available for case marking here is the 1-arc A because the 2-arc B is locally erased, is therefore not an output arc, consequently no shallow arc, and subsequently not licit as a closure arc. The resulting well-formed structure with 1-arc being replaced-II and therefore flagged is given in (225).

(225)

Like the cases discussed above, sentence (223) is at first glance also compatible with another structure satisfying the Closure Law, shown in (226).

(226)
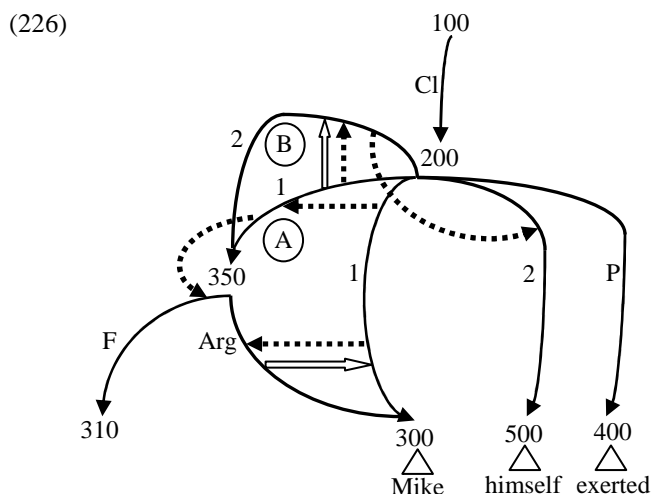
In this structure, the 1-arc is not replaced-II but rather defines the output of Replace-II. But similar to the other cases, an independent law excludes this structure, viz. the Replacer L-Successor Incompatibility Law from (78), repeated here as (227).

(227) *The Replacer L-Successor Incompatibility Law*
       Replacer (A) → ¬∃B (L-Successor (B,A))

In contrast to the well-formed structures in (218)-(221) where the replacers have foreign successors, this structure contains a replacer having a local successor. As this violates (227), the structure in (226) is excluded.

The Closure Law coupled with my idea about the labeling of pioneers eventually allows one to deal with the examples in (163), repeated here as (228), that is, instances of multiple flagging.

(228) a. Maria tanzt   mit dem   Mann.
           Maria dances with the.DAT man
           Maria dances with the man.
       b. Maria geht an den   Tisch.
           Maria goes on the.ACC table
           Maria goes to the table.

As pointed out, these examples might seem to be incompatible with the overall structure for case and adpositional marking because of the presence of two flags, viz. a preposition and a case suffix. However, they aren't. As already remarked earlier, I deviate from the assumption that pioneers bear a unique label (be it 'Marq' or '60'), and rather claim that the labels for pioneers belong to the set of argumental R-signs. Consequently, language particular rules determining flagging structures not only need to determine the shape of the flag, but also the label of the pioneer. The modified versions of the rules stated in (186)-(189) are given in (229)-(232)

(229) *German Directional Rule (Final Version)*
       Dir-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ↔ F-Arc (B) ∧
       PH-Headed (B,an) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 2-Arc (C)

(230) *German Comitative Rule (Final Version)*
       Com-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ↔ F-Arc (B) ∧
       PH-Headed (B,mit) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 3-Arc (C)

(231) *German 2-Arc Rule (Final Version)*
       2-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ↔ F-Arc (B) ∧
       PH-Headed (B,-n) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 60-Arc (C)

(232) *German 3-Arc Rule (Final Version)*
       3-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ↔ F-Arc (B) ∧
       PH-Headed (B,-m) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 60-Arc (C)

To understand the availability of multiple flags, consider the rules for directionals and comitatives. Both rules not only specify the properties of the flag, but also the label of the pioneer, which is required to be '2' for directionals, and '3' for comitatives. The structures incorporating this change for the directional *an den Tisch* from (228a) and the comitative from (228b) are provided in (233) and (234), respectively; PH-headedness is abbreviated as usually by the triangle notation.

(233)   (234)
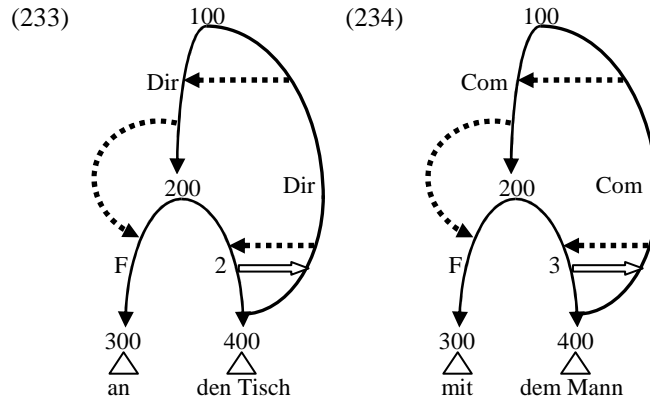
The key aspect for a unified treatment of such examples with multiple flags and examples with only one flag are the pioneers in (233) in (234). Consider their properties. They are object-arcs, qua R-sign. They are also shallow arcs: they are structural-arcs (again qua R-sign), they are output arcs (because they are not L-erased), and they are not F-erased either, thereby vacuously satisfying the condition on admitted F-erasers. Now the Closure Law demands that shallow arcs bearing an object R-sign be closure arcs as well. This is certainly not the case in both (233) and (234). Therefore, the 2-arc and the 3-arc in (233) and (234), respectively, have to be replaced-II as well, resulting in the following structures.

(235)

Dir
100
200
F
2
Dir
300
△
an
310
2
F
60
410
△
-en
400
△
d- Tisch

(236)

Com
100
200
F
3
Com
300
△
mit
310
3
F
60
410
△
-em
400
△
d- Mann
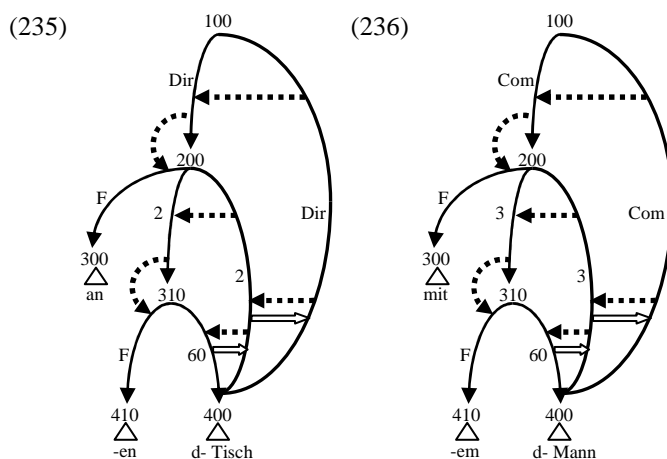
Since 2-arcs, that is, direct objects, require accusative marking, the structure in (235) now contains two flags, one headed by the preposition *an* and the other one headed by the appropriate accusative suffix. Similarly in (236): since 3-arcs, that is, indirect objects, require dative marking, this structure now contains two flags, one headed by the preposition *mit* and the other one headed by the appropriate dative suffix. Importantly, the availability of two flags as conceived of in (235) and (236) is compatible with the overall structure for flagging structure because it contains a *multiple satisfaction* of the condition regulating flagging structures, viz. a recursive satisfaction of Replace-II[64].

Both structures in (235) and (236) have in common is the label of the 'deepest' pioneer, viz. that this pioneer bears the R-sign '60'. This labeling follows from the rules for 2-arcs and 3-arcs in (231) and (232), respectively. What makes 60-arcs special is that as soon as they are 'reached', no further flagging structure is permitted. This is due to a[65] benefit of the biconditional formulation of the Closure Law. In order to see that the biconditional formulation of the Closure Law is at stake, consider the following structures in which the 60-arcs have replacers-II.

---

[64] Alternatively, one could stick to the idea that flags are always neighbors of 60-arcs but that their label is complex (cf. fn. 29 of chapter 5). For example, the successor of a Com-arc would bear the label <60,3>, whereas that of a Dir-arc would bear the label <60,2>, and the constituent heading the 60-arc either surfaces with dative or with accusative marking. Although a viable alternative for elements marked with two flags, it faces problems with elements marked by three or more flags. One language that employs triple marking is Dargwa, cf. (i).
(i) *žuz* (book)
    a. *žuz-li*, ergative
    b. *žuz-li-či*, allative
    c. *žuz-li-či-la*, thematic

(Mel'čuk 2006, p. 143)

As the data show, the ergative is built on the basis of the stem, the allative on the ergative, and the thematic on top of the allative.

[65] There are more benefits of the biconditional formulation of the Closure Law, viz. that it excludes unattested cases of multiple flagging structures, viz. cases of iterative flagging and cases where a constituent is marked not only the surface object it bears but also for non-surface object relations. I discuss these cases in section 4 of chapter 7.

(237)   (238)
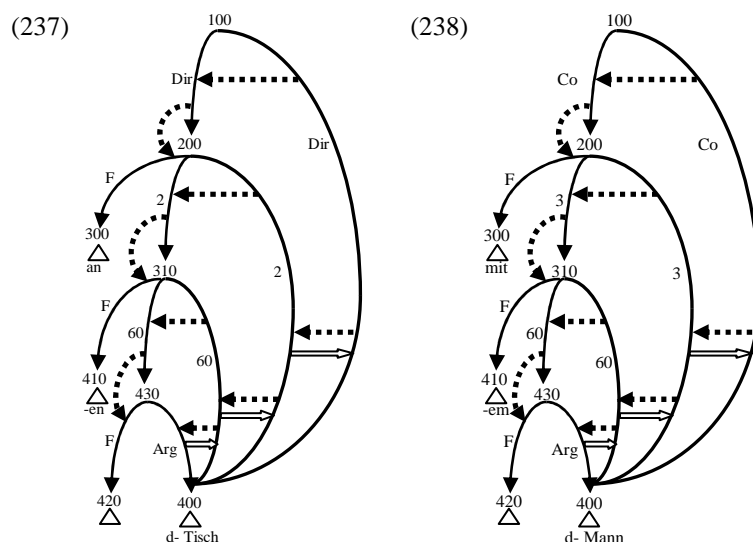
Now consider the following, faulty version of the Closure Law, which is not formulated as a biconditional but only as a material implication.

(239) *The Closure Law, faulty version*
       Object-Arc (A) ∧ Shallow Arc (A) → Closure Arc (A)

What is of importance is that a material implication can be true even when its antecedent clause is false. Now return to the structures in (237) and (238) and consider the closure arc labeled '60'. This arc satisfies the faulty version of the Closure Law because under this version nothing excludes arcs other than object-arcs that are shallow arcs as closure arcs. This is so because the faulty version only specifies a necessary condition for object-arcs that are also shallow arcs but it does not specify necessary conditions for closure arcs themselves. To put it informally, the faulty version only says under which conditions flagging *has* to occur but it doesn't say that it must *only* occur under these conditions. The biconditional formulation of the Closure Law guarantees both aspects because it also specifies necessary conditions for closure arcs, viz. that they are object-arcs and shallow arcs. For this reason, the structures in (237) and (238) are excluded: the 60-arc is a closure arc but, importantly, 60-arcs are not *object-arcs*, but *pseudo-object-arcs* (cf. chapter 5). Consequently, given the biconditional formulation of the Closure Law, no 60-arc can ever get replaced-II. The presence of 60-arcs therefore captures that flagging structures are not unboundedly available. Or to put informally: no constituent is ever marked by a never-ending sequence of flags.

I should mention two open issues in connection to the sanctioning of structures with multiple flags. The first relates to the claim that the presence of 60-arcs coupled with the biconditional formulation of the Closure Law is responsible for the fact that flagging of a constituent stops at some point. This is so because 60-arcs qua R-sign are excluded form the domain of Replace-II. This account however presupposes that

60-arcs *are* reached at some point, that is, that some 60-arc does occur as a pioneer. If 60-arcs didn't occur, unboundedly many recursively embedded flagging structures *are* permitted after all because apart from 60-arcs, the set of admissible pioneers contains only object-arcs, and these *have* to be replaced-II. There are two options to deal with this issue. Then first one is to set up a special law demanding that every closure arc must have an R-branch that is a 60-arc. This law is formulated in (240).

(240) *The Closure Arc R-Branch Law*
       Closure Arc (A) → ∃B (60-Arc (B) ∧ R-Branch (B,A))

The second option is to leave this aspect out of grammatical theory proper, and relocate it to the realm of performance factors that eventually filter out such a language as an attestable language, due to its unfitness. This account is similar to the suggestion made in Postal 1986 for the fact that no language possesses a morpheme of infinite length, cf. (241).

(241) *"For example, no doubt every attestable NL* [natural language, A.P.]*, like every attested NL, will have a maximum bound on attestable morpheme length of about a dozen or so phonemes. Certainly, none will contain a constrained morpheme of phoneme length nine billion. But this fact about attestable NLs will surely follow from a characterization of human nature, and is thus not strictly a linguistic universal in the sense of being a property of NLs per se; NLs involve no bound on morpheme length, just as they manifest none on sentence length."*

                                                                     (Postal 1986, p. 3)

At this moment, I have no clue which option to prefer, and since this issue is of no direct relevance for the general analysis of case and adpositional marking structures, I leave it unsettled. The second open issue is whether there any constraints on sequences of multiple closure arcs in general. For example, in (236), the closure arc labeled 'Com' has as one of its branches the closure arc labeled '3'. The question is whether this is lawful or not. If not, one expects also the opposite situation to occur in natural languages, viz. that a closure arc labeled '3' has as one of its branches a closure arc labeled 'Com'. Up to this point, I don't know whether such systems are attested or not. In case they don't, this would indicate that the situation in (236) is indeed lawful, and that natural languages *are* characterized by restrictions on the proper labeling of sequences of closure arcs. The formulation of such a law is technically a trivial matter, given the concept of *outrank* (cf. Johnson & Postal 1980, pp. 250-1), which defines a binary antisymmetric relation between R-signs. It would then be possible to state a restriction that inter alia excludes closure arcs labeled by an oblique R-sign as branches of a closure arc labeled by an object R-sign. Such a constraint would be satisfied by the sequence of closure arcs in (236), but importantly not by the reverse sequence, that is, one where the closure arc labeled '3' has a closure arc as its branch that is labeled 'Com'. I nevertheless refrain from formulating such a law because this requires a deeper understanding of the internal structure of both the set of oblique R-signs and the set of object R-signs, and I so far lack such an understanding.

6.6.3   Why the Resuming Element Agrees in Case and Preposition

Equipped with the analysis for case affixes and adpositions, one can now deal with the agreement effects for case and preposition between the resuming element and the extracted element. Consider again the structure in (145), repeated here as (242).

(242)
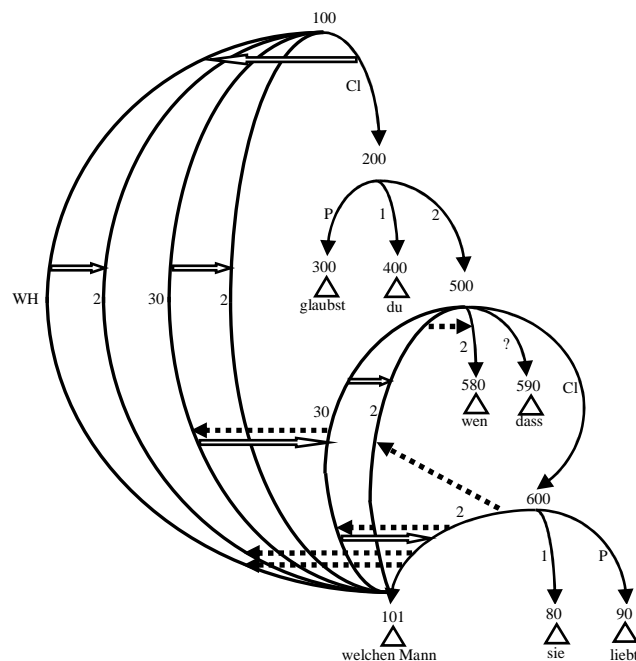
The reason why both the resuming element and the extracted element end up being flagged in the same way follows from an interaction of the Closure Law and the rules regulating the presence of flags. As for the first point, both the arc corresponding to the extracted element (arc G) and the arc corresponding to the resuming element (arc H) *are object-arcs and shallow arcs*; therefore they have to be closure arcs as well, that is, that they have to determine flagging. Regarding the second issue, the reason why they determine the same type of flagging is because arc G and arc H are *equivalent*, that is, the resuming element and the extracted element agree in their grammatical relation. Since grammatical relations determine the specific flagging structure, the resuming element and the extracted element end up being marked by the same flag.

I illustrate both issues in more detail. Consider first the status of both arcs as object-arcs and shallow arcs. That they are objects arcs is obvious, as they bear an object R-sign, viz. '2'. That they are shallow arcs is equally obvious: they are structural-arcs (qua R-sign), they are output arcs (because they are not L-erased), and they satisfy the condition on admissible F-erasers (arc G is F-erased by an overlay-arc, viz. by

the 30-arc E, and arc H is not F-erased). Consequently, they have to determine a flagging structure. Importantly, and this brings us to the second issue, both arcs bear the same label, viz. '2'. The reason why they agree in grammatical relation is because the resuming element is a replacer for the relational marker connected to the extracted element. Since the relational marker bears the same label as the extracted element and since the replacer bears the same label as replacee in general, both the resuming element and the extracted element bear the same grammatical relation. Consequently, the same flagging rule that has to be satisfied by the arc corresponding to the resuming element also has to be satisfied by the arc corresponding to the extracted element. Therefore, they require the same flagging structure, and the resuming element and the extracted element end up being marked identically. With respect to the structure in (242), the relevant rule is the one for 2-arcs, repeated here in (243).

(243) *German 2-Arc Rule (Final Version)*
       2-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ↔ F-Arc (B) ∧
       PH-Headed (B,-n) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 60-Arc (C)

As an effect, both the extracted element and the resuming element in (243) end up being marked by accusative case. The modified structure incorporating the satisfaction of the German 2-Arc Rule is shown in (244).

(244)

This line of reasoning carries over in the same way to structures with extracted constituents marked by prepositions. Consider the following structure with an extracted comitative.
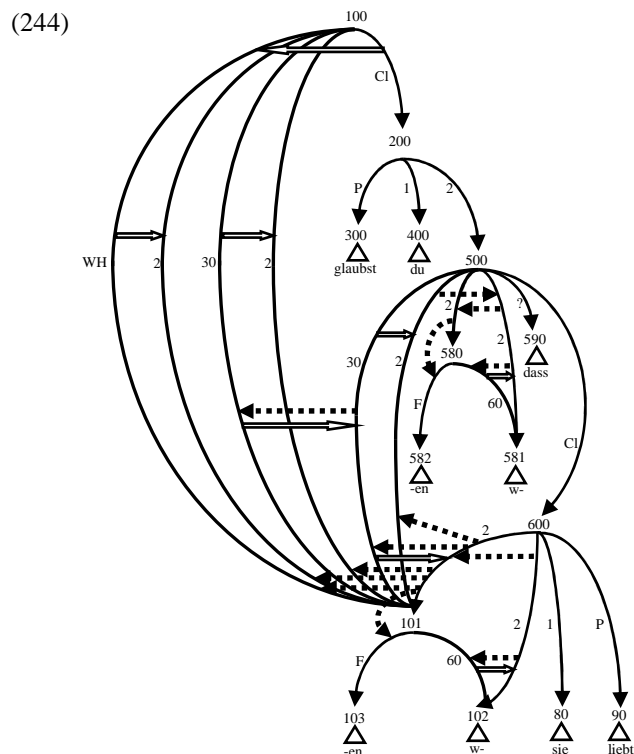
(245)
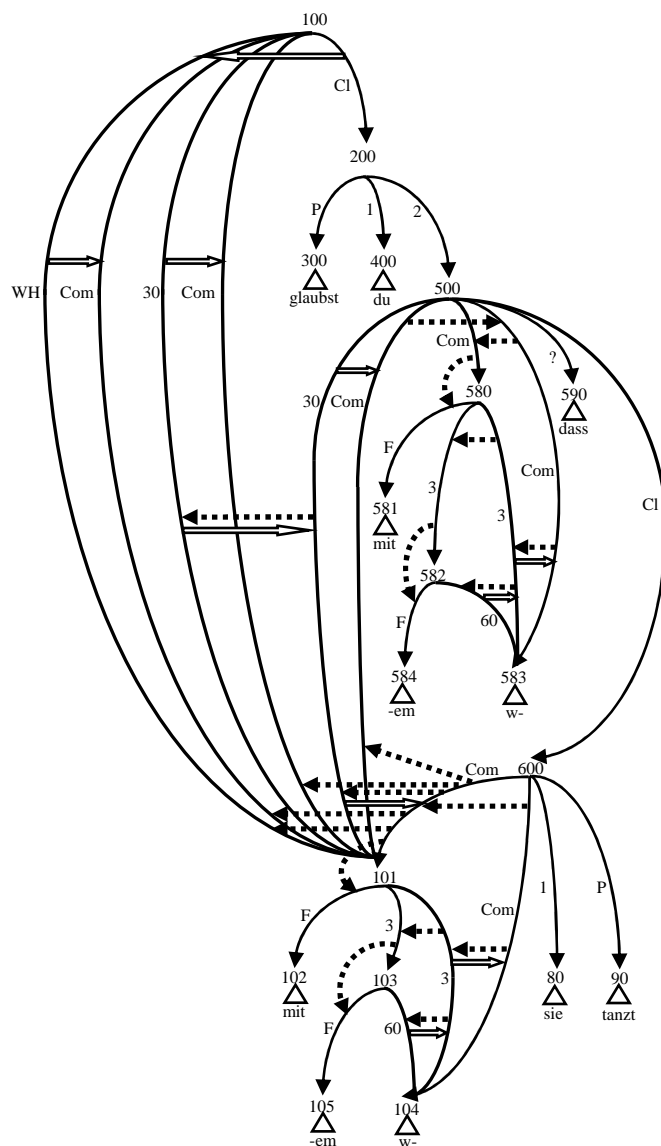
The flagging of the extracted element and the resuming element is obtained in the same way as in (244). The arcs corresponding to the extracted element and the resuming element both need to be closure arcs because they are object-arcs and shallow arcs. Therefore, the German Comitative Rule has to be satisfied.

(246) *German Comitative Rule (Final Version)*
       Com-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ↔ F-Arc (B) ∧
       PH-Headed (B,mit) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 3-Arc (C)

Since this rule requires a 3-arc as a pioneer, and since this pioneer is itself a shallow
arc, it itself has to determine a flagging structure.

Similar to the analysis for the availability of proforms, this analysis is insensitive to
the morphological complexity of the extracted element because flagging rules make
no reference to such factors. Consequently, the same structures are equally required
with the extracted element being a complex wh-phrase, as shown in (247) and (248).

(247)
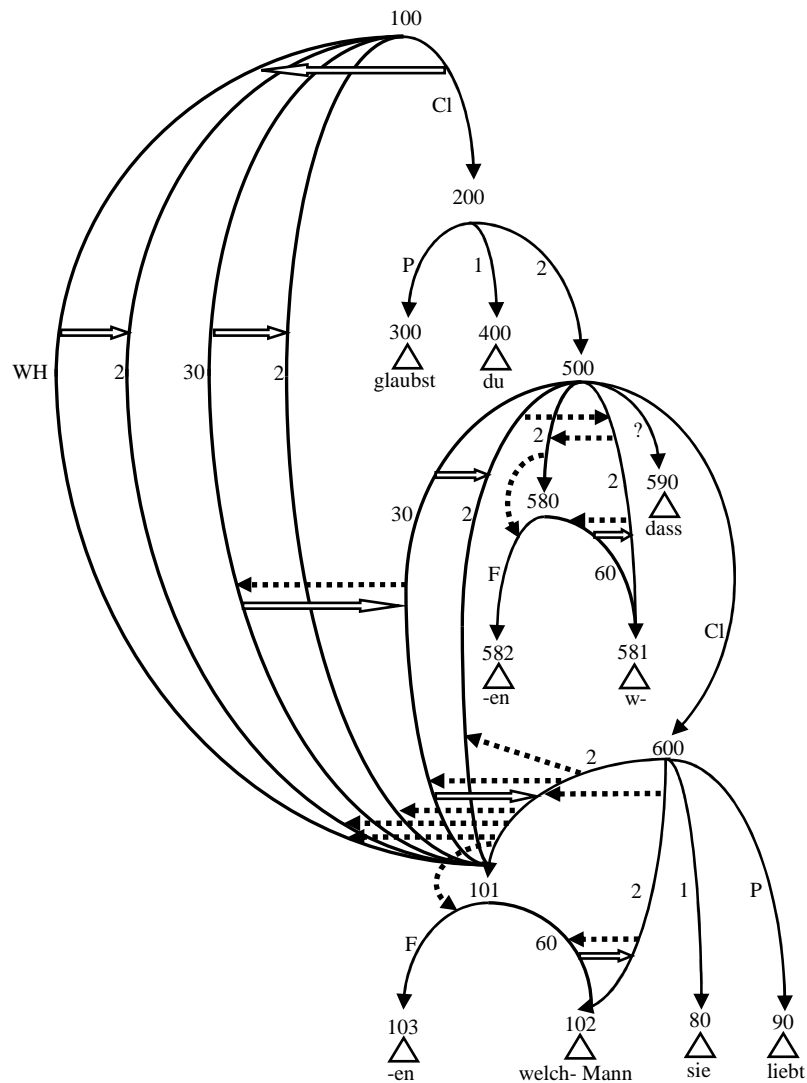
(248)
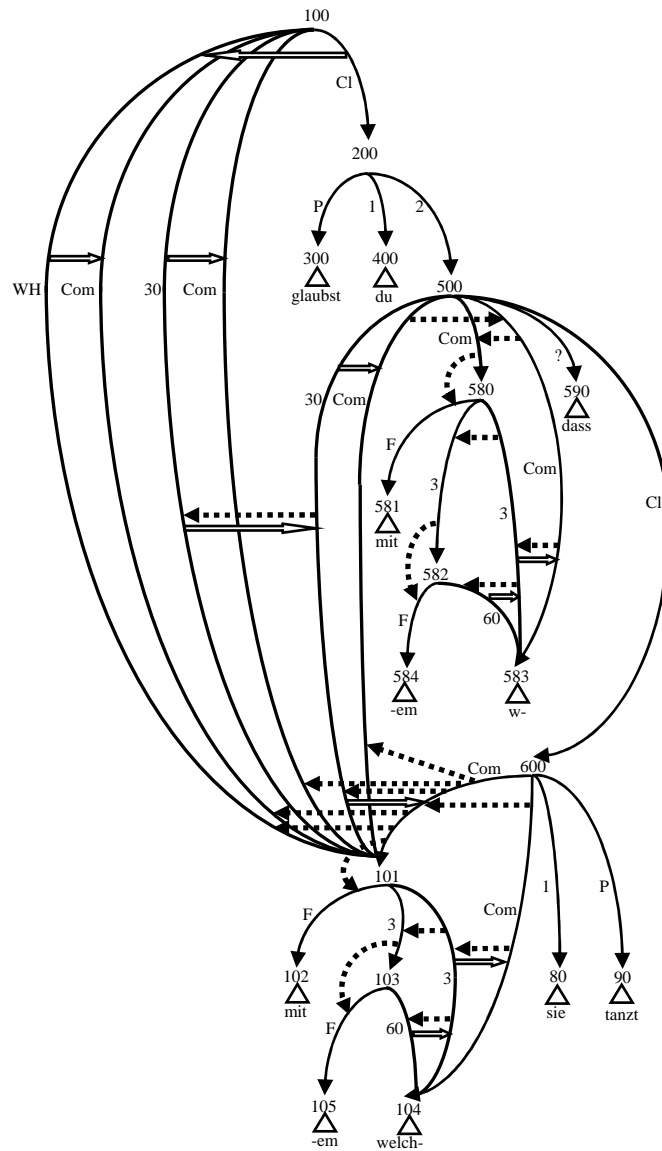
The analysis for the agreement effects for case and prepositional marking certainly gives the desired results for the examples considered so far, viz. those examples where the extracted element is characterized by a unique flagging pattern. But there are cases such as the ones in (249) and (250), already mentioned in chapter 3.

(249) a. Er lehrt ihm/   ihn   die lateinische Sprache.
       he teaches him.DAT/him.ACC the Latin   language
       He teaches him the Latin language.

b.* **Wen**   glaubst du <u>wem</u>   er t die lateinische Sprache   lehren wird?
   who.ACC believe you who.DAT he the Latin   language teach will
c.* **Wen**   glaubst du <u>wen</u>   er t die lateinische Sprache   lehren wird?
   who.DAT believe you who.ACC he the Latin   language teach will
d. **Wem**   glaubst du <u>wem</u>   er t die lateinische Sprache   lehren wird?
   who.DAT believe you who.DAT he the Latin   language teach will
e. **Wen**   glaubst du <u>wen</u>   er t die lateinische Sprache   lehren wird?
   who.ACC believe you who.ACC he the Latin   language teach will
Who do you believe he teaches the Latin language?

(250) a. Sie schreibt ihm/   an ihn   einen Brief.
   she writes   him.DAT/on him.ACC a   letter
She writes a letter to him.
b.* **An wen**   denkst du <u>wem</u>   sie t einen Brief schreibt?
   on who.ACC think you who.DAT she a   letter writes
c.* **Wem**   denkst du <u>an wen</u>   sie t einen Brief schreibt?
   who.DAT think you on who.ACC she a   letter writes
d. **Wem**   denkst du <u>wem</u>   sie t einen Brief schreibt?
   who.DAT think you who.DAT she a   letter writes
e. **An wen**   denkst du <u>an wen</u>   sie t einen Brief schreibt?
   on who.ACC think you on who.ACC she a   letter writes
Who do you think she writes a letter to?

In these examples, the two objects show different flagging possibilities. Whereas the first object in both (249a) and (250a) is uniquely marked by accusative, the second object is not characterized by a unique flagging but allows alternative flagging possibilities. Regarding (249a), the first object of *lehren* (Engl. to teach) is always marked by accusative, whereas the second object is compatible either with dative or with accusative marking. And with respect to (250), the first object of *schreiben* (Engl. to write) is also uniquely marked by accusative, whereas the second object can either surface with dative marking or with the preposition *an* (Engl. on). As pointed out in chapter 3, if the second object is the extracted element in a wh-copying sentence, then no matter which of the two markings the extracted elements bears, the resuming element has to bear the same marking as the extracted element, as the contrasts in (249b-d) and (250b-d) illustrate. It is these contrasts that require the constraint that the resuming element has to agree with the extracted element for flagging, and that the resuming element need not only satisfy connectivity. For if connectivity were at stake, the flagging of the resuming element could differ from that of the extracted element because the connectivity requirement would still be fulfilled. More specifically, as connectivity is fulfilled in the b- and c-examples (as demonstrated by the a-examples), connectivity is too weak a requirement, whereas agreement excludes these examples and permits only the d- and e-examples.

In order to account for such examples with the analysis developed so far, the alternation between different flagging structures for the second object must be taken as an indication for a alternation in the grammatical relation borne by the second object. This is so because since each grammatical relation determines a unique flagging structure, an alternation in the flagging possibilities of an element can only

be accommodated by positing an alternation between different grammatical relations of this element. And in fact, I argue that the alternations in (249) and (250) involve an alternation in the grammatical relation of the second object. More specifically, I argue that the alternation in (249a) involves an alternation of the second object of *lehren* between a 2- and a 3-object, and not simply an alternation between dative and accusative marking for the second object. Similarly, I argue that the alternation in (250a) involves an alternation of the second object of *schreiben* between a 3-object and an object-relation that for the time being I call 10-object[66], and not only an alternation between dative marking and marking by *an* for the second object. Granting the correctness of this account, for which I provide evidence presently, the contrasts between the wh-copying examples in (249) and (250) follow neatly from the analysis developed so far. The structure for the grammatical examples in (249d) and (249e) are given in (251) and (252), respectively.

(251)

---
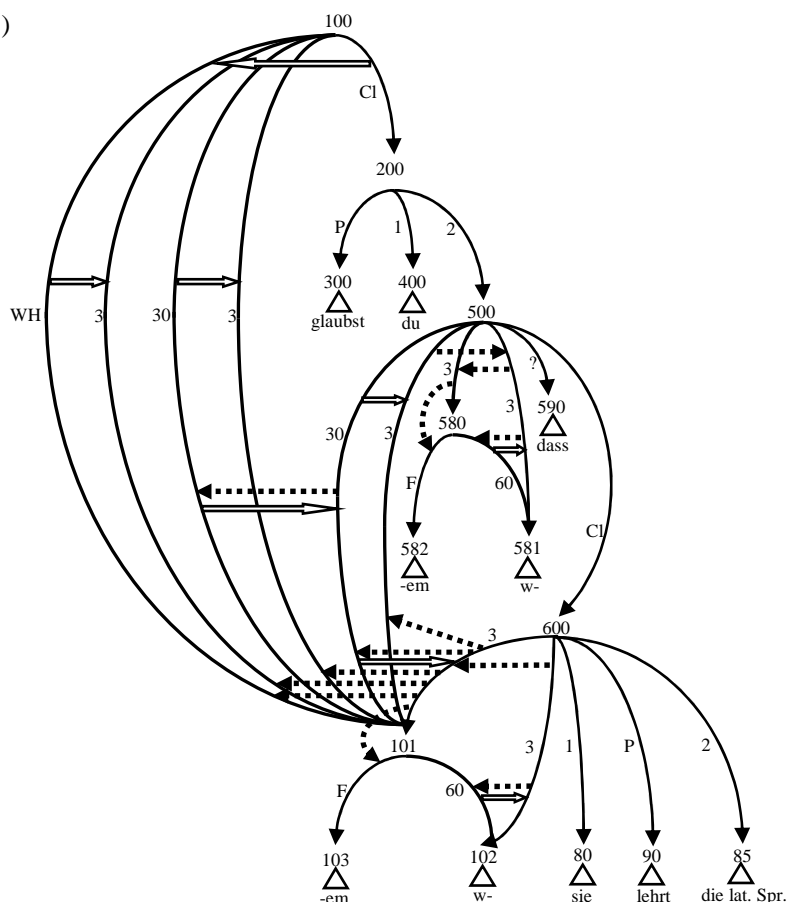
[66] This label is chosen purely for convenience and in fact doesn't matter much; all that matters is that this label is distinct from the ones for the object and adverbial relations used so far.

(252)
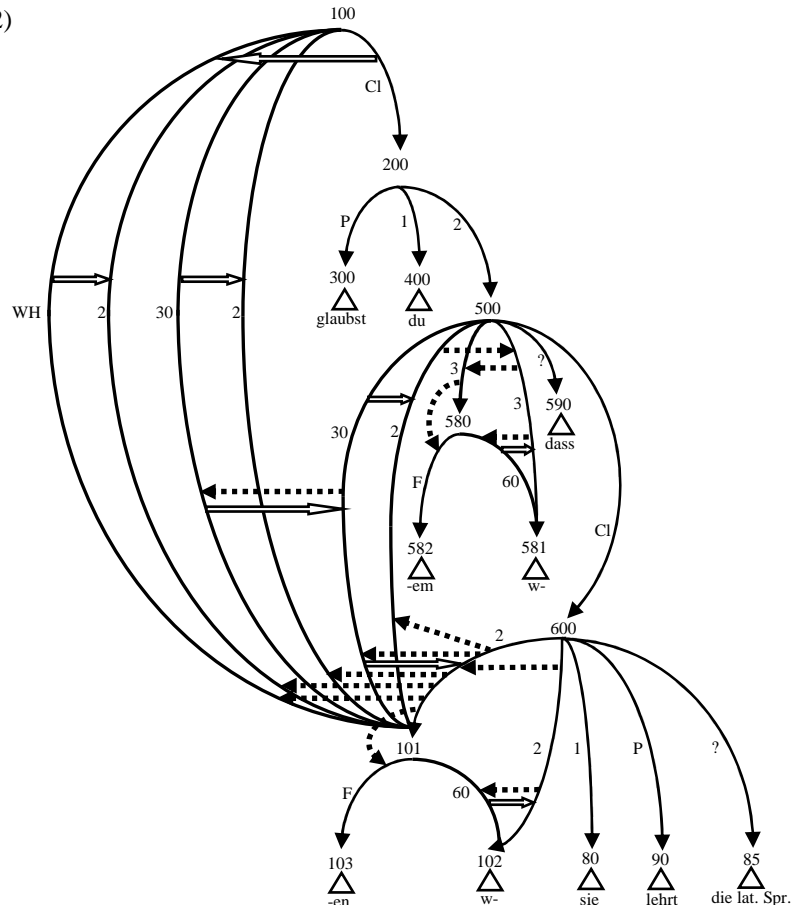
In these structures, both the arc corresponding to the extracted element and its relational marker as well as the relational marker and the replacer arc are equivalent, therefore the replacer arc is equivalent to the arc corresponding to the extracted element. Given their equivalence, both the extracted element and the resuming element end up being flagged identically. The structures for the ungrammatical examples in (249b) and (249c) are provided in (253) and (254), respectively.

(253)

100

Cl

200

P　1　2

300　400　500
glaubst　du

WH　2　30　2

30　2

2　2
?

580　2　590
dass

F　60

582　581
-en　w-

Cl

2　600

101

F　60

103　102　80　90　85
-en　w-　sie　lehrt　die lat. Spr.

2　1　P　?

(254)

100

Cl

200

P　1　2

300　400　500
glaubst　du

WH　3　30　3

30　3

2　2
?

580　2　590
dass

F　60

582　581
-en　w-

Cl

3　600

101

F　60

103　102　80　90　85
-em　w　sie　lehrt　die lat. Spr.

3　1　P　2
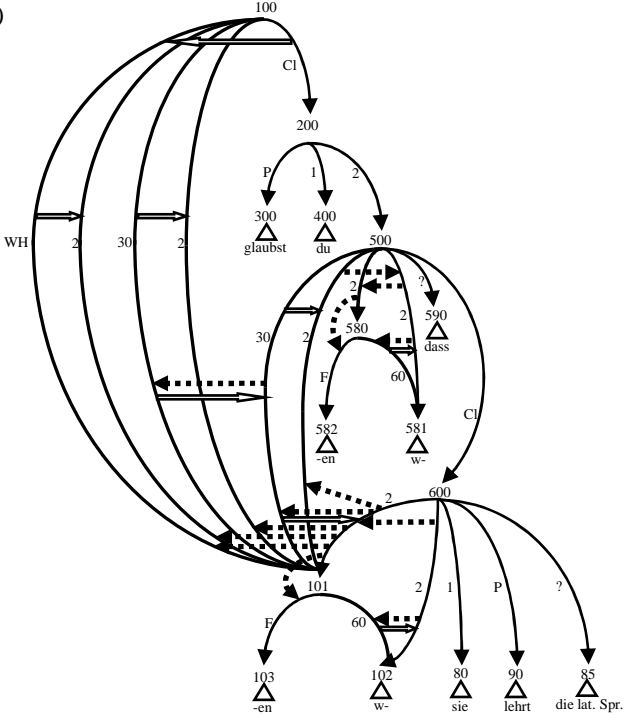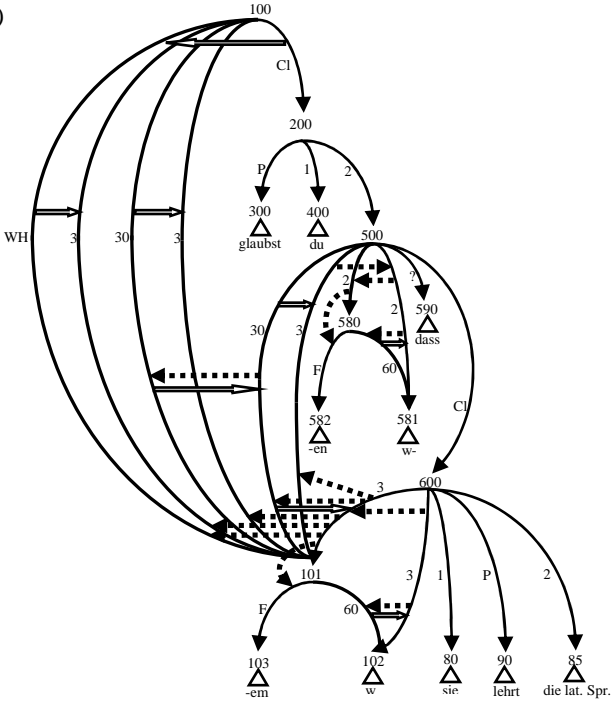
In (253), the resuming element bears the 3-object relation whereas the extracted element bears the 2-object relation; the opposite situation is instantiated in (254). However, such a mismatch in grammatical relation between the extracted element and the resuming element is impossible because any relational marker always bears the same grammatical relation as the extracted element. Since the resuming element is a replacer to the relational marker, and since replacers are always equivalent to the arcs they replace, the extracted element and the resuming element have to bear the same grammatical relation. There are however two other seemingly well-formed structures for the ungrammatical sentences in (249b) and (249c), which two structures are illustrated in (255) and (256), respectively.

(255)

(256)

100

Cl

200

P   1   2

300   400   500
glaubst   du

WH   3   30   3

30   3   2   ?
                             590
              580   2   3 dass

           F   60

           582   581
           -en   w-

                        3   600

           101   3   1   P   2

      F   60   80   90   85
                          sie lehrt die lat. Spr.
103   102
-em   w
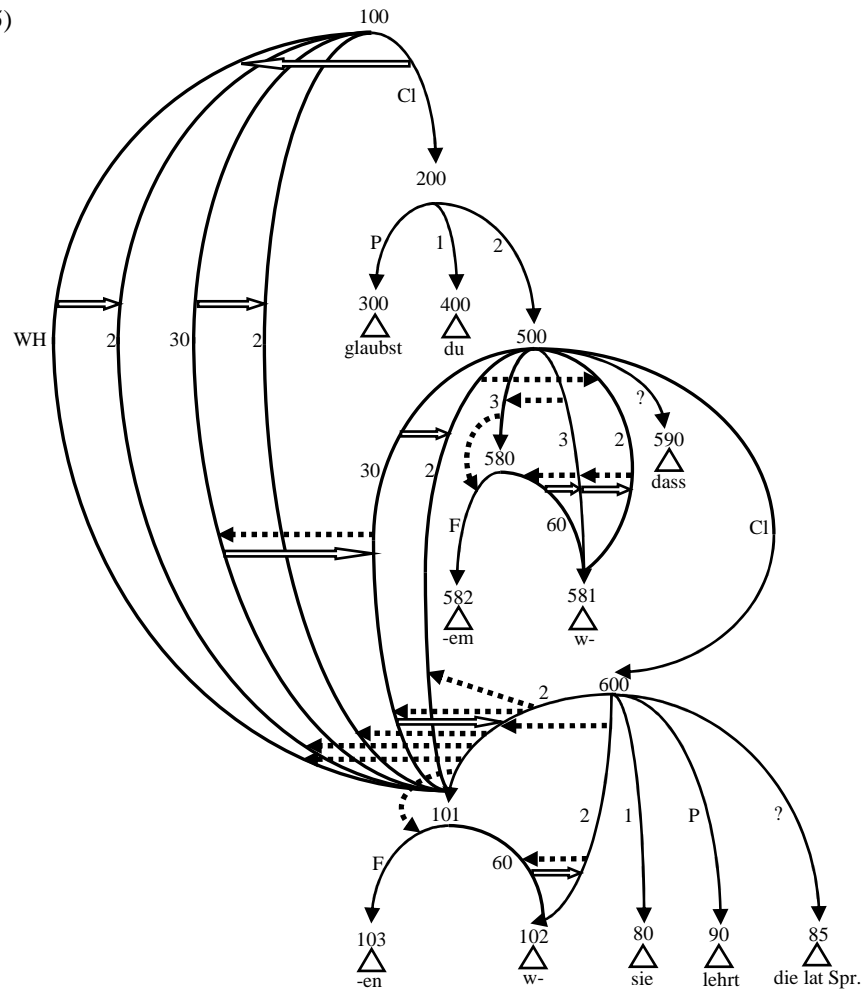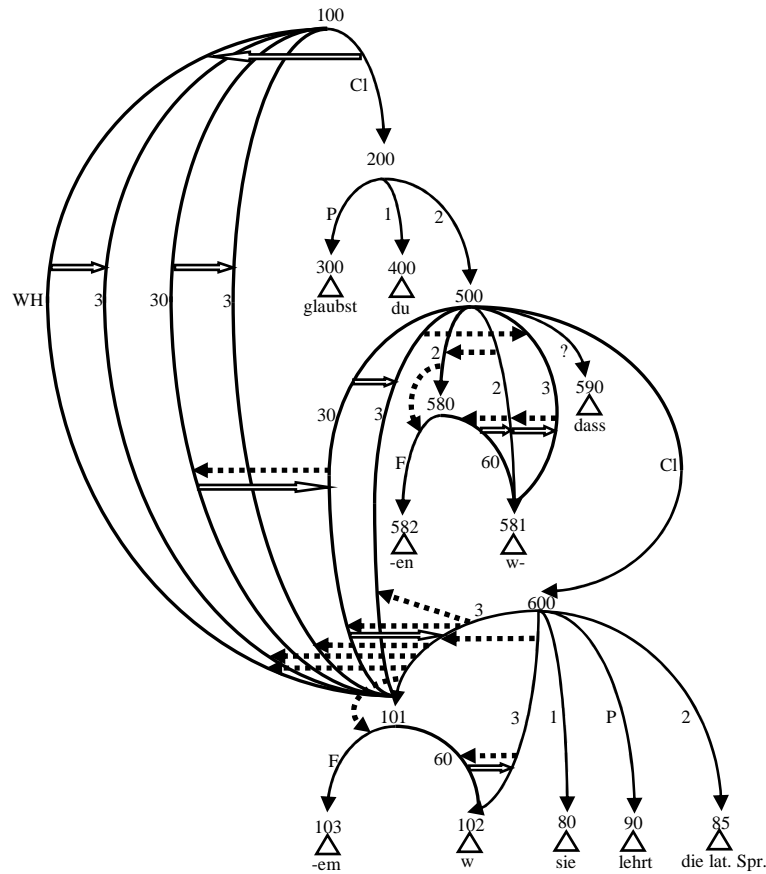
In both structures, the replacer is equivalent to the relational marker and subsequently sponsors a local successor bearing either the 3-relation as in (255), or the 2-relation, as in (256). The resulting structures are ones where the extracted element bears accusative marking and the resuming element dative marking, as in (255), or where the extracted element bears dative marking and the resuming element accusative marking, as in (256). Although no probem arises with respect to the label of the replacer arc (as was the case with the structures in (253) and (254)), these two structures are nevertheless ungrammatical. For they involve a replacer with a local successor. But the Replacer L-Successor Incompatibility Law from (78) repeated here as (257) forbids precisely such configurations.

(257) *The Replacer L-Successor Incompatibility Law*
         Replacer (A) → ¬∃B (L-Successor (B,A))

Consequently, no matter what grammatical relation the extracted element bears prior to extraction, the resuming element ends up bearing the same grammatical relation. This account carries over to the contrasts in (250).

I now turn to the evidence that the alternations in the flagging possibilities for the second objects in (249a) and (250a) involve an alternation between grammatical relations borne by them. The arguments I put forward are all of the same type. I first show that the different flagging possibilities associated with the second objects go hand in hand with syntactic differences of these second objects. And I then show that these syntactic differences cannot be reduced to the different flagging structures themselves but rather must be treated as a function of the different grammatical relations involved, thereby dismissing the alternative that the alternations in (249a) and (250a) are only an indication of exceptional flagging possibilities for the second objects. There are in total three arguments favoring the view that the alternations in (249a) and (250a) involve different grammatical relations and not identical grammatical relations with exceptional flagging properties. The first two concern the alternation in (249a), whereas the third one relates to the alternation in (250a).

The first argument comes from *passivization*. The second object allows two types of passives, one associated with the auxiliary *bekommen*, the other one with the auxiliary *werden*, illustrated in (258a) and (258b), respectively.

(258) a. Er   bekam den   Gartenbau gelehrt.
          he.NOM got   the.ACC horticulture taught
       b. Er   wurde den   Gartenbau gelehrt.
          he.NOM became the.ACC horticulture taught
          He was taught horticulture.

This optionality in the choice of the auxiliary is of no surprise for the account that the alternation in (249a) involves a second object that is either a 3-object marked by dative case or a 2-object marked by accusative case because passivization of 2-objects requires the auxiliary *werden*, whereas passivization of 3-objects requires the choice of the auxiliary *bekommen*, as illustrated in (259).

(259) a. Ich schenke dem   Mann einen Wagen.
          I   donate the.DAT man a.ACC car
          I donate a car to the man.
       b. Der   Wagen wurde dem   Mann geschenkt.
          the.NOM car   was the.DAT man donated.
          The car was donated to the man.
       c. Der   Mann bekam einen Wagen geschenkt.
          the.NOM man got   a.ACC car   donated
          The man was donated a car.

The optionality illustrated in (258) is then simply a function of the different grammatical relations the second object can bear: (258a) involves passivization of a 2-object, whereas (258b) involves passivization of a 3-object. Importantly, the two types of passive make reference to the grammatical relation previously borne by the derived subject and not simply to its previous flagging structure. For example, the *werden*-passive is associated with 2-objects and not with accusative marked elements, as (260) and (261) make clear, which show that accusative marking of an element is not sufficient for this element to be targeted by the *werden*-passive.

(260) a. Ich warte den   ganzen Tag auf ihn.
           I   wait   the.ACC whole   day upon him
           I wait for him all day long.
       b.* Der   ganze Tag wurde auf   ihn gewartet.
           the.NOM whole day was   upon him waited
           *All day was waited for him.
       c. Wir müssen den   nächsten Bahnhof umsteigen.
           we   must   the.ACC next   station change
           We have to change at the next station.
       d.* Der   nächste Bahnhof muss von uns umgestiegen werden.
           the.NOM next   station must of   us   changed   become
           *The next station must be changed by us.

(261) a. Peter hat den   Beweis vernommen.
           Peter has the.ACC proof   heard
           Peter has heard the proof.
       b.* Der   Beweis wurde von Peter vernommen.
           the.NOM proof   was   of   Peter heard
           *The proof was heard by Peter.
       c. Kühe geben Milch.
           Cows give milk.
       d.* Milch wird   von Kühen gegeben.
           milk   becomes of   cows   given
           *Milk is given by cows.

(260a) and (260c) illustrate adverbials marked by accusative, and as (260b) and
(260d) show, they resist *werden*-passivization. (261a) and (261c) contain objects
that, following Postal 2010, I call *4-objects*. (261b) and (261d) show that 4-objects
resist *werden*-passivization as well. Identifying the objects in (261) as 4-objects is
suggested by the fact that they behave similarly to 4-objects in English: not only are
they marked by accusative and resist passivization, they also resist middle formation
(cf. (262)), contrary to regular 2-objects (cf. (263)[67]).

(262) a.* Solche Beweise vernehmen sich mühelos.
           such   proofs   hear   SELF effortless
           * Such proofs hear themselves without any effort.
       b.* Milch gibt   sich quasi   von alleine.
           milk   gives SELF virtually of   alone
           * Milk gives itself virtually by itself.

---

[67] The examples in (263) show that thematic roles are of little help for the formulation of the constraints
governing passive structures. For they are nearly synonymous to the examples in (261), yet they show
different passivization possibilities. Similarly, that the status of the subject in (261b) as an experiencer is
irrelevant for the ungrammaticality of this sentence is revealed by the fact that such subjects don't block
passivization in general.
(i) Der Baum wurde   von Peter gesehen.
     the tree   became of Peter   seen
     The tree was seen by Peter.

(263) a. Ich verstehe diesen Beweis.
      I   understand this.ACC proof
      I understand this proof.

    b. Dieser Beweis wird von jedem verstanden.
      this.NOM proof became of everyone understood.
      This proof was understood by everyone.

    c. Dieser Beweis versteht sich quasi ohne jegliches Vorwissen.
      this.NOM proof understands SELF virtually without any foreknowledge
      This proof understands itself basically without any prior knowledge.

    d. Kühe produzieren Milch.
      Cows produce milk.

    d. Milch wird von Kühen produziert.
      milk becomes of cows produced
      Milk is produced by cows.

    e. Milch produziert sich quasi von alleine.
      milk produces SELF virtually of alone
      Milk produces itself basically by itself.

Similarly, the *bekommen*-passive is associated with 3-objects and not with dative marked elements, as is revealed by the contrasts in (264), showing that dative marking of an element is not sufficient for this element to be targeted by the *bekommen*-passive [68].

(264) a. Der Sklave dient seinem Herrn.
      the.NOM slave serves his.DAT master
      The slave serves his master.

    b.* Der Herr bekommt von seinem Sklaven gedient.[69]
      the.NOM master gets of his slave served
      The master is served by his slave.

    c. Der Herr misstraut seinem Sklaven.
      the.NOM master mistrusts his.DAT slave
      The master mistrusts his slave.

    d.* Der Sklave bekommt von seinem Herrn misstraut.
      the.NOM slave gets of his master mistrusted
      The slave is mistrusted by his master.

---

[68] The differing passivization properties of the objects in (260) and (261) suggests that that indirect objects divide into two types of dative-marked elements, similar to the division of what is traditionally called direct objects, which divide up into 2- and 4-objects.

[69] The ungrammaticality of this example shows that the traditional name for such passives in the German linguistic literature is deceptive, which calls them *Rezipientenpassiv* (recipient passive). As this example shows, being a recipient is not a necessary condition for the availability of such passives. Moreover, being a recipient is not a sufficient condition either, as revealed by the following grammatical examples.

(i) a. Peter stahl mir mein Fahrrad.
      Peter stole me.DAT my bike.
      Peter stole my bike.

    b. Ich bekam mein Fahrrad gestohlen.
      I got my bike stolen.

The dative marked constituent in (ia) is not a recipient, but is compatible with a recipient passive.

The second argument concerns the different predictions made by the proposals for the alternation in (249a) with respect to *the status of the first object*. If the alternation in (249a) were an effect of an alternation in the grammatical relation borne by the second object, then one expects the first object to lose its status as a 2-object as soon as the second object surfaces as a 2-object. This follows from *Stratal Uniqueness* (cf. Perlmutter & Postal 1983, p. 92). In a nutshell, Stratal Uniqueness guarantees that no sentence can contain multiple relationally equivalent constituents, for otherwise a sentence could contain multiple subjects, direct objects, etc. Such situations are excluded by Stratal Uniqueness. If however the alternative proposal is correct according to which the alternation in (249a) simply involves an exceptionally flagging possibility for a relationally constant second object, then the first object still shows all signs of being a 2-object. And again, it is the first proposal that makes the correct predictions. More specifically, the first object no longer behaves like a 2-object but rather like a 4-object, as suggested by the following two observations. First, when the second object shows up as a 2-object, then the first object all of the sudden loses its property to be passivized, similar to 4-objects (cf. 261).

(265)* Der   Gartenbau wurde   ihn   gelehrt[70].
          the.NOM horticulture became him.ACC taught
          Horticulture was taught to him.

This inability to be passivized is not an effect of a general impossibility to passivize the first object of *lehren* (Engl. to teach), as demonstrated by the grammaticality of (266), where the second object shows up as 3-object.

(266) Der   Gartenbau wurde   ihm   gelehrt.
          the.NOM horticulture became him.DAT taught
          Horticulture was taught to him.

Secondly, middle clauses based on the first object *lehren* are predicted to be possible if the second object is a 3-object but not if the second object is 2-object. This is so because only in the former case is the first object a 2-object, whereas it is a 4-object in the other case, and 4-objects resist middle formation, cf. (262). Interestingly, the prediction is borne out.

(267) a. Der   Stoff lehrt   sich diesem Schüler sehr einfach.
              the.NOM topic teaches SELF this.DAT student very easily
      b.* Der   Stoff lehrt   sich diesen   Schüler sehr einfach.
              the.NOM topic teaches SELF this.ACC student very easily
              The topic teaches itself easily to the student.

---

[70] The ungrammaticality of examples similar to the one in (265) has already been noticed in den Besten 1989, p. 215. However, there seems to idiolectal variation regarding the grammaticality of such sentences because Tappe 1984b judges a parallel structure grammatical (his ex. 32). Presumably the grammar of some speakers blocks passivization of 4-objects quite generally whereas the grammar others does so only when a 4-object is the single object of a precicate. This is reminiscint of English, where passivization of 4-objects is also only blocked when they are single objects of a predicate (cf. Postal 2010, p. 266).

Thirdly, there are two more constructions specific to German that are defined for 2-objects only. The first one involves a type of raising that creates subjects of the verb *sein* (Engl: to be) embedding a *zu*-infinitive. The second construction also involves a type of raising but one that creates subjects of the verb *gehören* (Engl. belong) embedding a participial infinitive. Both resulting structures bear a necessity-like meaning. Consider the examples in (268), where the a-example illustrates a bare active clause, the b-example raising to the subject position of *sein*, and the c-example raising to the subject position of *gehören*.

(268) a. Peter liest einen Aufatz.
        Peter reads a.ACC article
        Peter reads an article.
    b. Der   Aufsatz ist zu lesen.
       the.NOM article is to read.INF
    c. Der   Aufsatz gehört gelesen.
       the.NOM article belongs read.PRTCP
       The article needs to be read.

As the examples in (269) show, both types of raising are compatible with ditransitive verbs but only if the 2-object is raised; raising of the 3-object is illicit.

(269) a. Der   Mann schenkt ihm   den   Roman.
        the.NOM man   donates him.DAT the.ACC novel
        The man passes him the novel.
    b. Der   Roman ist ihm   zu schenken.
       the.NOM novel   is him.DAT to donate
    c. Der   Roman gehört ihm   geschenkt.
       the.NOM novel   belongs him.DAT donated
       The novel needs to be donated to him.
    d.* Er   ist den   Roman zu schenken.
       he.NOM is the.ACC novel   to donate
    e.* Er   gehört den   Roman geschenkt.
       he.NOM belongs the.ACC novel   donated
       He needs to be donated the novel.

In addition to this, consider the following data showing that the subject in both constructions can not correspond to a previous 4-object.

(270) a. Peter hat den   Plan vernommen.
        Peter has the.ACC plan heard
        Peter has heard the plan.
    b. Kühe geben Milch.
       Cows give milk.
    c.* Der   Plan ist zu vernehmen
       the.NOM plan is to hear
       The plan needs to be heard.

      d.* Milch ist zu geben.
          milk is to give
          Milk needs to be given.
      e.* Der   Plan gehört vernommen
          the.NOM plan belongs heard
          The plan needs to be heard.
      f.* Milch gehört gegeben.
          milk   belongs given
          Milk needs to be given.

In light of these observations, the proposal involving an alternation in the grammatical function of the second object makes two predictions. First, it predicts that the first object of *lehren* loses its ability to be the subject of *sein* or gehören if the second object surfaces as a 2-object. This is so because the first object is turned into a 4-object as soon as the second object is turned into a 2-object, and 4-objects cannot be raised to the subject position of either *sein* or *gehören*. Second, it predicts that the first object of *lehren* can be raised to the subject position of *sein* or *gehören* if the first object retains its 3-object status. This is so because if the second object retains its 3-object status, the first object also retains its 2-object status, and 2-objects can be raised to the subject position of both *sein* and *gehören*. The alternative proposal on the other hand predicts a uniform behavior of the first object irrespective of dative or accusative marking on the second object because this difference is of no relevance for the status of the first object. Crucially, it is the predictions of the first proposal that are borne out.

(271) a.* Der   Gartenbau ist ihn   zu lehren.
         the.NOM horticulture is him.ACC to teach
     b.* Der   Gartenbau gehört ihn   gelehrt.
         the.NOM horticulture belongs him.ACC taught
         Horticulture needs to be taught to him.

(272) a. Der   Gartenbau ist ihm   zu lehren.
         the.NOM horticulture is him.DAT to teach
     b. Der   Gartenbau gehört ihm   gelehrt.
         the.NOM horticulture belongs him.DAT taught
         Horticulture needs to be taught to him.

From the availability of the two types of passives, the contrasts between (265) and (266), and (271) and (272), I conclude that the first object is in fact not a 2-object when the second object is a 2-object, but that the first object is demoted to 4-object. Therefore the proposal according to which the alternation in (273a) is an effect of distinct grammatical relations borne by the second object is correct. Regarding the resulting status of the first object, I assume that it demotes to 4-object due the

advancement of the original 3-object to 2-object[71]. In sum, the two objects of the verb *lehren* (Engl. to teach) are permitted in the following structural contexts.

(273)

(274)
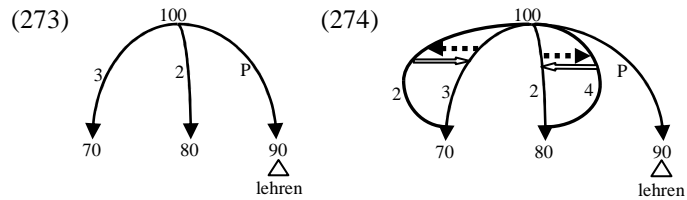
Consequently, the structure in (252) needs to be revised in the following way.
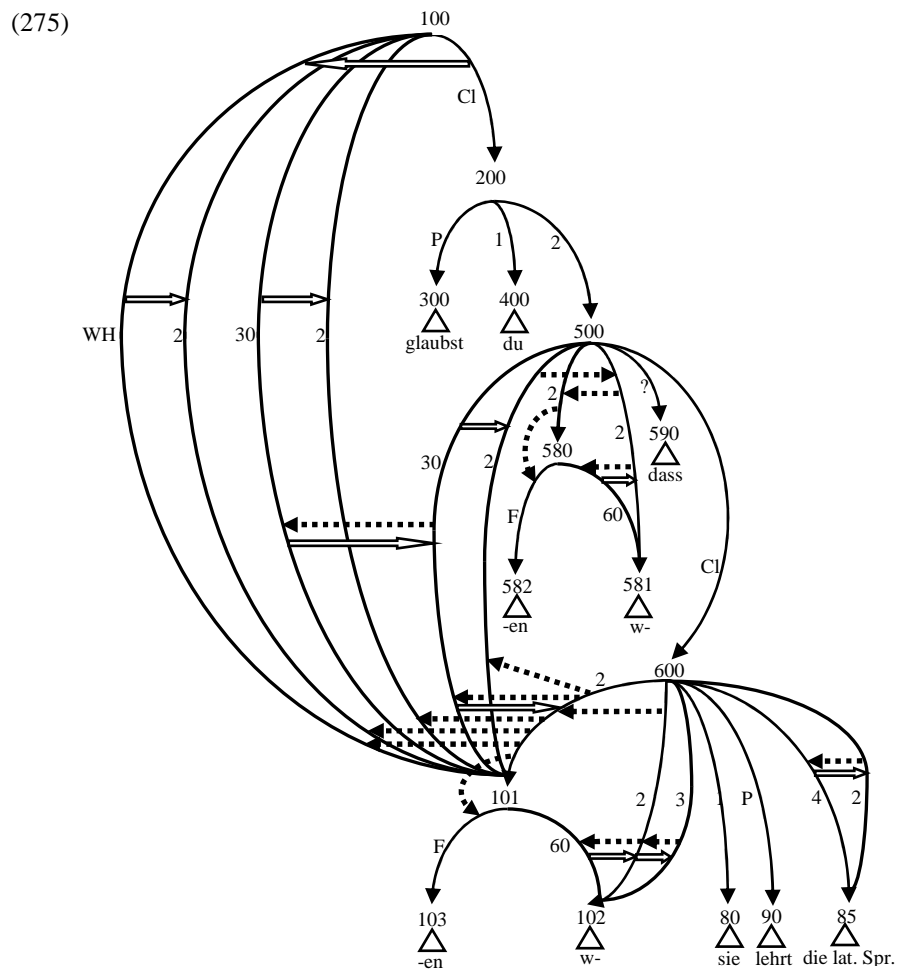
(275)

I finally turn to the alternation in (250a). Again, the question is whether this alternation is due to an alternation in the grammatical relation of the second object or whether it simply reflects an exceptional flagging possibility of this second object. The argument that allows one to distinguish between the two options that I want to put forward rests on *extraposition* data from German. By extraposition, I refer to the option that a constituent appears in a position that is to the right of its canonical position. In German, extraposition targets a dedicated position. This position (called the *Nachfeld* in traditional German grammar) is the position (i) to the right of an infinite verb in verb second clauses or (ii) the position to the right of finite verb in verb final clauses. (276a) illustrates the former option, (276b) the latter option; 'e' marks the canonical position of the extraposed constituents.

(276) a. Peter hat e geschlafen <u>gestern</u>.
           Peter has   slept   yesterday.
           Yesterday, Peter slept.
      b. (Ich weiß) dass Peter e geschlafen hat <u>gestern</u>.
            I   know that Peter   slept   has yesterday
           I know that Peter slept yesterday.

In the examples to follow, I restrict myself to extraposition in verb second clauses. With respect to the contrast in (250a), it turns out that the second object can be extraposed when marked by the preposition *an*, but that it cannot be extraposed when marked by dative case.

(277) a. Ich habe e Briefe geschrieben <u>an ihn</u>.
            I   have   letters written   on him.ACC
      b.* Ich habe e Briefe geschrieben <u>ihm</u>.
            I   have   letters written   him.DAT
           I have written letters to him.

Under the first proposal, the contrast in (277) is due to the different grammatical relations borne by the second object. More specifically, the contrast in (277) shows that 10-objects can be extraposed, whereas 3-objects cannot. Under the second proposal, however, the contrast in (277) would simply be related to the different phrasal status of the second objects. More specifically, the relevant constraint would be one that excludes NPs from extraposition but allows PPs. Taking a closer look at extraposition in German and the type of element that can undergo it, it turns out that the relational constraint is correct. Consider the following examples, which are compatible with both types of constraints.

(278) a.* Plötzlich hat e den Hund gesehen <u>der   Briefträger</u>.
            suddenly has   the dog   seen   the.NOM postman
           Suddenly, the postman saw the dog.
      b.* Ich habe e gesehen <u>den   Mann</u>.
            I   have   seen   the.ACC man
           I have seen the man.

    c.* Ich habe e das Buch gegeben <u>dem   Mann</u>.
       I   have   the book given   the.DAT Mann
       I gave the man the book.

    d. Ich hab e gedacht <u>an   dich</u>.
       I   have   thought upon you
       I have thought of you.

    e. Ich bin e eingeschlafen <u>in der Wartehalle</u>.
       I   am   fallen.asleep   in the waiting.room
       I have fallen asleep in the waiting room.

    f. Ich bin e eingeschlafen <u>während der Verhandlung</u>.
       I   am   fallen.asleep   while   the trial
       I have fallen asleep during the trial.

    g. Oft   wurde e schon   bezweifelt <u>dass Darwin Recht hat</u>.
       often became   already doubted   that Darwin right has
       It has often been doubted that Darwin is right.

    h. Peter hat gestern   e gesagt <u>dass Maria schnarcht</u>.
       Peter has yesterday   said   that Maria snores.
       Yesterday, Peter said that Maria snores.

Under the first proposal, these contrasts indicate that all object relations other than 1-, 2-, and 3-objects can be extraposed. This constraint *is* compatible with the grammatical extraposition of subject and object clauses in (278g) and (278h) because such clauses have recently been argued to not only bear the 1- or 2-relation but also a relation dubbed '9' (cf. Postal 2010, ch. 9). Alternatively, under the second proposal, the contrasts indicate that basically all constituents (PPs, clauses, and adverbs (cf. 276)) can be extraposed, except for one type of constituent, viz. NPs. However, that the first proposal is correct is revealed by the following data.

(279) a. Ich habe e gewartet <u>den   ganzen Tag</u>.
       I   have   waited   the.ACC whole day.
       I've been waiting the whole day.

      b. Viele haben euch e angeklagt <u>des   Mordes</u>.
       many have   you   accused   the.GEN murder
       Many have you accused of murder.

      c. Ich muss e aussteigen <u>nächsten Bahnhof</u>.
       I   must   exit   next.ACC station
       I have to leave at the next station.

These data show that NPs *can* be extraposed as long as they don't bear a 1-, 2-, or 3-object relation but an adverbial relation. Consequently, the relevant constraint on extraposition cannot be stated in terms of the phrasal status of the extraposed element but only in terms of the grammatical relation the extraposed element bore prior to extraposition. Therefore, the contrast in (277) cannot be due to a different phrasal status of the second object either but can only be due to a difference in the grammatical relation borne by the second object. I assume more specifically that the second object of *schreiben* (Engl. to write) is underlyingly a 3-object and either surfaces as such, or that it advances to 10-object, which relation requires the

preposition *an* (Engl. on), similar to the English 10-relation, demanding the preposition *on*.

(280)   (281)

schreiben   schreiben
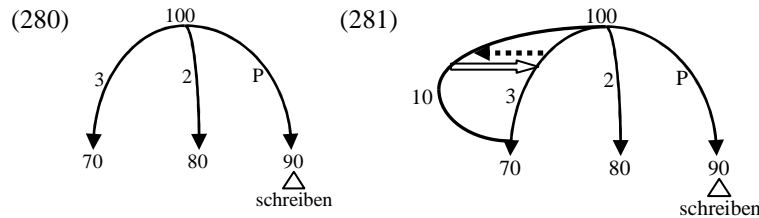
6.6.4   Adverbs as Resuming Elements

Equipped with the analysis for the agreement properties for case and prepositional marking in wh-copying structures, it becomes possible to deal with those wh-copying structures involving adverbs as resuming elements. Consider the following data involving adverbs as resuming elements.

(282) a. **Wann** glaubst du <u>wann</u> sie   sich t getroffen haben?
            when   believe you when they SELF met   have
       b.* **Wann** glaubst du <u>wo</u>   sie   sich t getroffen haben?
            when   believe you where they SELF met   have
            When do you think that they met?
       c. **Wo**   glaubst du <u>wo</u>   sie   sich t getroffen haben?
            where believe you where they SELF   met   have
       d.* **Wo**   glaubst du <u>wann</u> sie   sich t getroffen haben?
            where believe you when they SELF   met   have
            Where do you think that they met?

(283) a. **In welchem Haus** glaubst du   <u>wo</u>   er t wohnt?
            in which   house believe you where he   lives
       b. **In welchem Haus** glaubst du   <u>in dem</u>   er t wohnt?
            in which   house believe you in that.NEUT.SG.DAT he   lives
            In which house do you think he lives?

In order to grasp the distribution of adverbs as resuming elements, I invoked the constraint that an adverb functioning as a resuming element needs to be relationally equivalent to the extracted element. This captures the contrasts in (282) because *wann* bears a temporal relation, whereas *wo* bears a locative one. Therefore, they cannot be used interchangeably. Similarly, the availability of *wo* in (283) in addition to *in dem* follows because *wo* bears a locative relation, just like the extracted element *in welchem Haus* does. Since APG considers grammatical relations to be primitive grammatical relations, the distribution of adverbs as resuming elements follows from the same mechanism that regulates the distribution of case affixes and

adposition. What is involved in both cases is the *relational equivalence of the extracted element and the resuming element*. The reason why the distribution of adverbs as resuming elements is subsumed under the relational equivalence between the extracted element and the resuming element follows from the treatment of adverbs in chapter 5 and in section 5 of this chapter. As I pointed out there, adverbs are not treated as a separate part of speech category, but as particles. The relevance of this treatment becomes clear when one considers the special properties of particles corresponding to adverbs, of which there are two. First, such particles have a very restricted distribution in that they are permitted only as elements bearing an *adverbial* relation. For example, the particle *wo* (Engl. where) can only be used to express a locational relation, whereas the particle *wann* (Engl. when) can only express a temporal relation. None of them for example can be used to express a subject or direct object relation, cf. (284).

(284) a.* Wann/wo   liebt den   Peter?
              when where loves the.ACC Peter
              Intended: Which point of time/which point in space loves Peter?
        b.* Wann/wo   liebt der   Peter?
              when where loves the.NOM Peter
              Intended: Which point of time/which point in space does Peter love?

Secondly, the particles corresponding to adverbs are subject to idiosyncratic flagging restrictions, at least in German. For example, they generally resist case marking, and they can only be flagged with a proper subset of prepositions.

(285) a. Wo/ *in wo   habt ihr euch t getroffen?
              where in where have you you   met
              Where did you meet?
        b. *Wo/   von wo   seid ihr t?
               where from where are you
              Where are you from?

(286) a. Wann/*zu wann hast du   angefangen zu promovieren?
              when at when have you started   to do.a.PhD
        b. *Wann/ seit wann arbeitest du   an deiner Doktorarbeit?
               when since when work   you on your   PhD
              When did you start working on your PhD?

Both these special properties are easily treated within APG. The first special property is in fact not so special from an APG perspective because given the lack of a lexicon in APG, words in general have to be specified for the structural conditions in which they can appear. The particles corresponding to adverbs then need the specification that they are only permitted under arcs bearing an adverbial relation. For example, *wo* would then be specified as an element that can only appear under an arc bearing the Loc(ational)-relation, but not under an arc bearing a Temp(oral)-relation, whereas the specification for *wann* would be the other way round, as illustrated in (287)-(290).

(287)   100   (288) *   100   (289) *   100   (290)   100

Loc   Loc   Temp   Temp

200   200   200   200
wo   wann   wo   wann
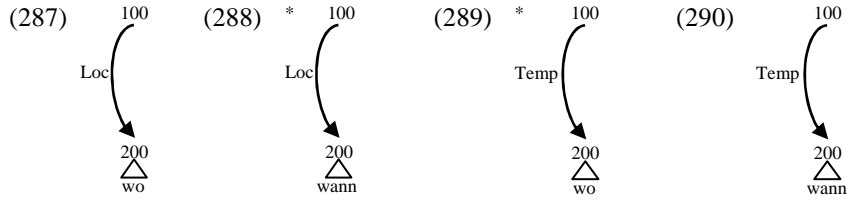
The second property can be easily captured by revising the flagging rules in such a way that these rules mention the POS-arc of the pioneer. For example, the German 2-Arc Rule and the German 3-Arc Rule need to be revised in the following way.

(291) *German 2-Arc Rule (Revised Version)*
    2-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ∧ Branch (D,C) ↔ F-Arc (B) ∧ PH-Headed (B,-n) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 60-Arc (C) ∧ N-Arc (D)

(292) *German 3-Arc Rule (Revised Version)*
    3-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ∧ Branch (D,C) ↔ F-Arc (B) ∧ PH-Headed (B,-m) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 60-Arc (C) ∧ N-Arc (D)

Both rules now restrict case marking to nouns because they can only be satisfied by those 2- and 3-arcs whose pioneer is headed by a noun. Similarly, in order to capture the distribution of *von* and *in* in (285), the following flagging rules are needed.

(293) *German Loc-Arc Rule*
    Loc-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ∧ Branch (D,C) ↔ F-Arc (B) ∧ PH-Headed (B,in) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 3-Arc (C) ∧ N-Arc (D)

(294) *German Source-Arc Rule*
    Source-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ↔ F-Arc (B) ∧ PH-Headed (B,von) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 3-Arc (C)

The difference between the two rules is that the rule for Loc-arcs is defined only for nouns, whereas the rule for Source-arcs is also defined for adverbs. This is so because the former rule can only be satisfied by those Loc-arcs whose pioneer is headed by a noun.
Return to the data in (282) and (283) illustrating adverbs as resuming elements. Basically, the particles corresponding to adverbs are available because nothing bars their presence, as long as they satisfy all constraints restricting their occurrence. In (282a), *wann* is permitted as a resuming element because the replacer arc defining the resuming element is a Temp-arc, and *wann* is allowed to head such an arc. The reason why the replacer is a Temp-arc is because the extracted element is a Temp-arc as well, and the resuming element and the extracted element always bear the

same grammatical relation, via relational markers. The same line of reasoning applies to (282c), the only difference being that this example involves Loc-arcs. The ungrammaticality of the examples in (282b) and (282d) is again a consequence of the agreement for grammatical relation between the resuming element and the extracted element. For as shown in (287)-(290), Temp-arcs cannot be headed by *wo*, and Loc-arcs cannot be headed by *wann*. Such a structure however would be instantiated in (282b) and (282d). More specifically, the structure in (282b) would involve a Temp-arc headed by *wo*, and the structure in (282d) would involve a Loc-arc headed by *wann*. As this violates the condition on admissible structural contexts for *wo* and *wann*, these structures are excluded as desired. The data in (283) also receive an easy treatment. Similar to (282c), the resuming element and the extracted element bear the same grammatical relation, viz. the Loc-relation. The extracted element is a complex wh-phrase that according to the German Loc-Arc Rule in (293) is flagged by the preposition *in*, and then via the German 3-Arc Rule by dative case. The replacer defining the resuming element is also a Loc-arc. In (283a), the replacer arc is headed by the particle *wo* that according to the condition regulating *wo*'s presence can only appear under a Loc-arc. Since this condition is satisfied, the structure, provided in (295), is well-formed.

(295)
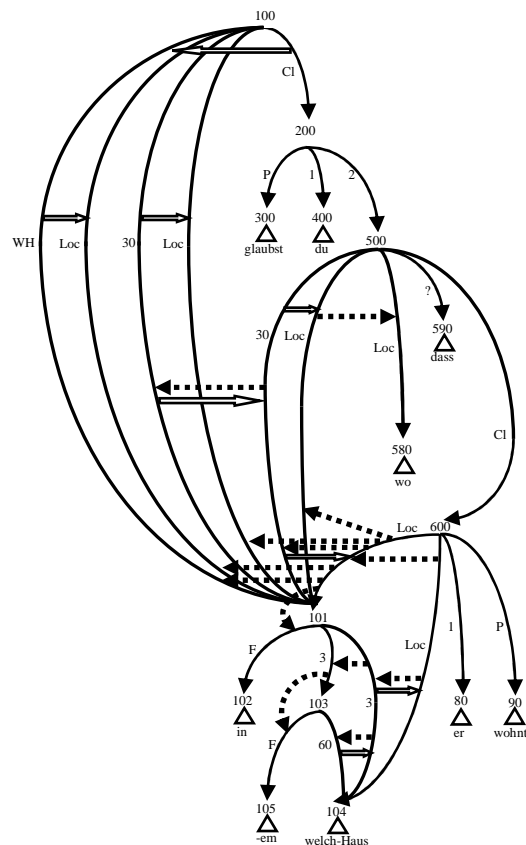
In addition, since both the German Loc-Arc Rule and the German 3-Arc Rule can only be satisfied in contexts where the respective pioneer is a noun, both rules cannot be satisfied, and neither case marking nor prepositional marking on *wo* is possible. In (283b) on the other hand, the replacer arc is headed by a nominal element, and therefore case and prepositional marking have to appear on it as well, as shown in the structure (296) for (283b).

(296)
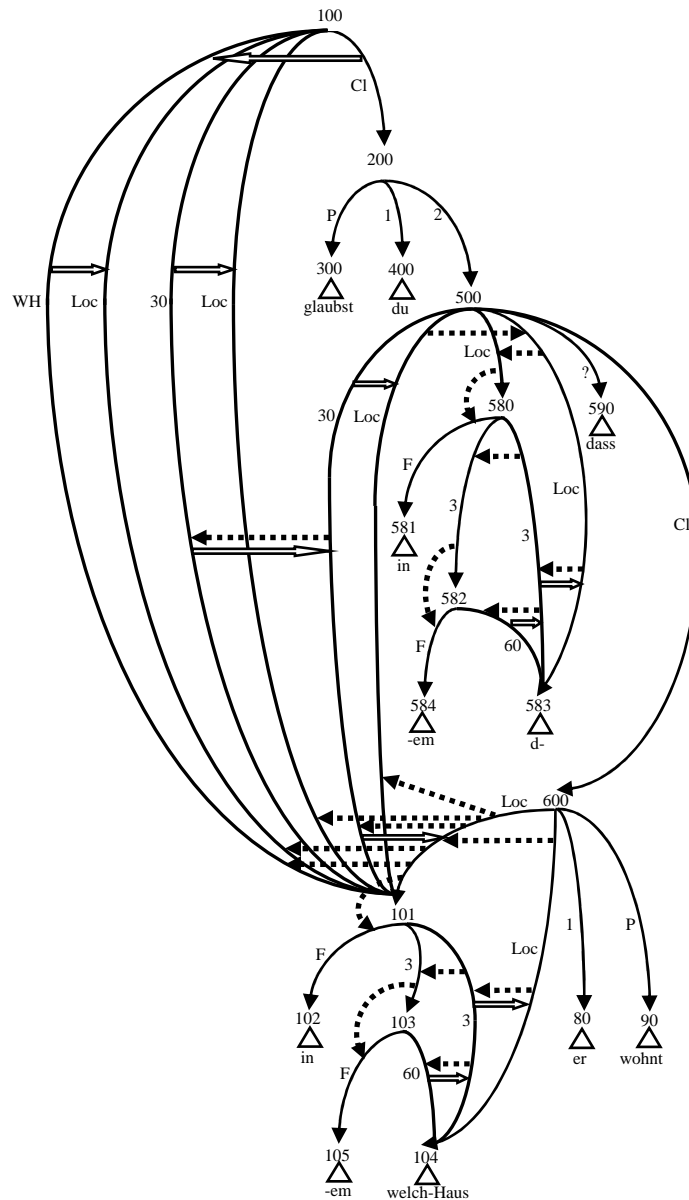
In sum, the optionality between an adverb as a resuming element or a nominal element is simply due to the fact that adverbial relations is compatible with either type of element.

To complete the treatment of adverbs as resuming elements, it has to be guaranteed that the right type of adverb occurs. For example, there are a number of locative adverbs, including inter alia *hoch* (Engl. high), *unten* (Engl. down), *rechts* (Engl. right), etc, but none of these are permitted. The reason why only *wo* is permitted has to with the fact that the resuming element also heads a Pro arc, as shown in the previous section. Pro arcs can only be headed by proforms because Pro arcs must not bear an inherent meaning, and only proforms satisfy this requirement. With respect to the choice of *wo*, I consider it to be a proform as well, in contrast to the adverbs mentioned a couple of lines ago, all of which do bear an inherent meaning. This line of reasoning extends to temporal adverbs as well, that is, I assume that *wann* is a proform in contrast to temporal adverbs such as *gestern* (Engl. yesterday), *frühs* (Engl, in the morning), *jährlich* (Engl. every year), all of which bear an inherent meaning. This analysis eventually makes it possible to state the relevant rules for the presence of *wann* and *wo*. Since they are proforms, they have to be D-arcs, because I assume proforms to head D-arcs in general. This means though that the previous statement needs to be revised according to which adverbs are particles that have to head adverbial relations. The reason this revision is necessary is because many particles are in fact restricted in that way, but not adverbial proforms. As a matter of fact, they must head D-arcs. Nevertheless, they are permitted only as D-arcs that are branches of arcs bearing an adverbial relation. In order to guarantee this, I propose the following rules.

(297) *German* wo *Rule (First Version)*
       PH-Headed (A,wo) → D-Arc (A) ∧ ∃B (Loc-Arc (B) ∧ Branch (A,B))

(298) *German* wann *Rule (First Version)*
       PH-Headed (A,wann) → D-Arc (A) ∧ ∃B (Temp-Arc (B) ∧ Branch (A,B))

The rule in (297) says that a D-arc headed by *wo* must be a branch of an arc bearing the Loc-relation, and the rule in (298) says that a D-arc headed by *wann* is a branch of an arc bearing the Temp-relation. Finally, in order to guarantee that they are D-arcs that only function as proforms, it has to be guaranteed that the D-arcs themselves bear no inherent meaning and that all their neighbors bear no inherent meaning either. This is guaranteed by the following revised versions of the rules.

(299) *German* wo *Rule (Revised Version)*
       PH-Headed (A,wo) → D-Arc (A) ∧ L-Headed (A, UN) ∧ ∃B (Loc-Arc (B) ∧ Branch (A,B) ∧ L-Headed (B, UN))

(300) *German* wann *Rule (Revised Version)*
       PH-Headed (A,wann) → D-Arc (A) ∧ L-Headed (A, UN) ∧ ∃B (Temp-Arc (B) ∧ Branch (A,B) ∧ L-Headed (B, UN))

These revised versions mention a predicate undefined so far, viz. L-headed. L-headed is similar to PH-headed, but it relates any basic-arc to the L-arc it R-supports. The definition is provided in (301).

(301) Def.: *L-Headed*

L-Headed (A, a) ↔ ∃B∃C∃D (Branch (B,A) ∧ POS-Arc (B) ∧ Branch (C,B)
∧ Stem-Arc (C) ∧ Branch (D,C) ∧ L-Arc (D) ∧ Logical Node (a, D))

Consequently, the rules sanctioning the presence of *wo* and *wann* state that they are permitted only internal to constituents that bear no inherent meaning, that is, only internal to Pro arcs. Graphically, the following structures are specified for *wo* and *wann*.
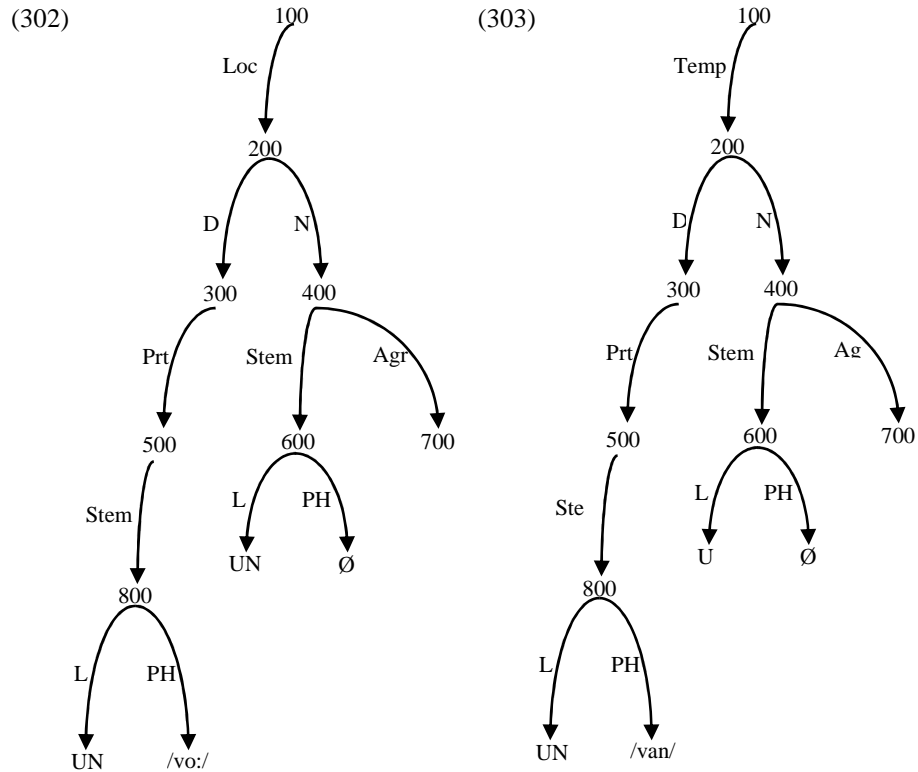
Therefore, only *wo* and *wann* are permitted as resuming elements bearing an adverbial relation because all the other adverbs mentioned above head neither D-arcs nor are they lacking inherent meaning. For example, the structure for *unten* and *gestern* is provided in (304) and (305).

(304)   100   (305)   100

                    Loc   Tem

                          200   200

                    Prt   Prt

                          300   300

                    Stem   Stem

                          400   400

              L   PH   L   PH

          DOWN   /ʊntʰən/   YESTERDAY   /ɡɛstʰɛʀn/
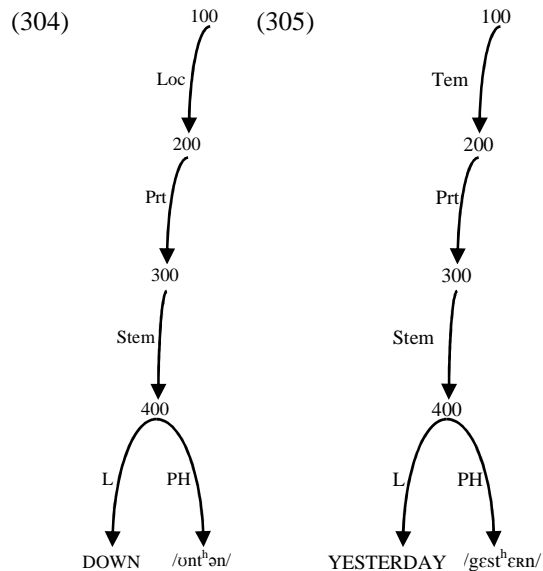
Analyzing *wo* and *wann* as particles heading D-arcs in German is equivalent to the claim that German possesses article-like elements that are particles. Although this claim sounds bizarre, it is crosslinguistically not uncommon for languages to possess particles functioning as articles, and therefore as D-arcs (cf. section 4). German is then not exceptional, but only restricts particles as articles to adverbial relations.

6.6.5   Conclusion

In this section, I have shown that also the second primary property of the resuming element, viz. the agreement restrictions regulating the distribution of case, prepositions, and adverbs, poses no problem under an APG analysis. That is a consequence of the fact that the resuming element and the extracted element are relationally equivalent, as guaranteed by independent factors, viz. the labeling of relational markers. Since it is grammatical relations that determine the distribution of case and adpositional marking, both the extracted element and the resuming element have to bear the same kind of marking, which means that they have to agree for this marking. Finally, the availability of adverbs as resuming elements to extracted elements that are not adverbs is also an effect of the relational equivalence between them. For adverbs are nothing but an alternative way of marking an element for some adverbial grammatical relation it bears, viz. by determining its full shape and by not requiring the presence of case affixes or adpositions. Importantly, since nothing bars structures where the adverbial grammatical relation of the extracted element is marked by a flagged constituent, whereas the same grammatical relation borne by the resuming element is marked by an adverb, such structures are permitted, as desired.

6.7   The APG Analysis for Agreement in Φ-Features

6.7.1   Introduction

The purpose of this section is to provide an analysis of the second secondary property of the resuming element, viz. that the resuming element has to agree with the extracted element in φ-features, that is, in number and gender features. I show in this section that φ-feature agreement is a function of a more general requirement. The connection between the extracted element and the resuming element is a specific instance of a general connection, viz. that holding between a proform and its antecedent, as argued for in section 6. This connection is in general characterized by the requirement that the proform agree with its antecedent in φ-features. Consequently, since the extracted element is an antecedent for the resuming element, both have to agree in φ-features. In the following subsection, I both formulate the relevant conditions regulating the φ-feature agreement between a proform and its antecedent in general and illustrate how these conditions have to be satisfied in the specific case of the connection between the resuming element and the extracted element.

6.7.2   Agreement between a Proform and its Antecedent

A proform has to agree with its antecedent in φ-features, as illustrated in (306).

(306)   Homer$_i$ says that he$_i$/she$_{*i}$/it$_{*i}$/they$_{*i}$ likes beer.

Only the proform *he* is licit in this example because only it agrees with its antecedent in all relevant φ-features: it is specified for singular (contrary to *they*) and for masculine gender (contrary to *she* and *it*). This requirement also holds for wh-copying, as shown in chapter 3, illustrated with two examples in (307).

(307)   a.* **Welchen Mann** glaubst du   <u>was</u>   sie t gesehen hat?
                which   man   believe you what she seen   has
                Which man do you think she has seen?
           b.* **Welchen Mann** glaubst du   <u>wen</u>   sie t gesehen hat?
                which   men   believe you who.MASC.SG she seen   has
                Which men do you think she has seen?

The ungrammaticality of these examples has the same basis as that of the sentence with *she*, *it*, and *they* in (306): the resuming element does not agree in φ-features with the extracted element. In (307a), the resuming element is marked for neuter gender, whereas the extracted element is marked for masculine gender. In (307b), the resuming element and the extracted element are both marked for masculine

gender, but they differ with respect to their number marking: the resuming element is marked singular, whereas the extracted element is marked plural.

The analysis I develop for φ-feature agreement analyzes it as an instance of overlapping arcs, and more specifically, of *overlapping Agr-arcs*[72]. This idea is illustrated in (308) for the simplified relevant substructure of the grammatical version of (306).

(308)
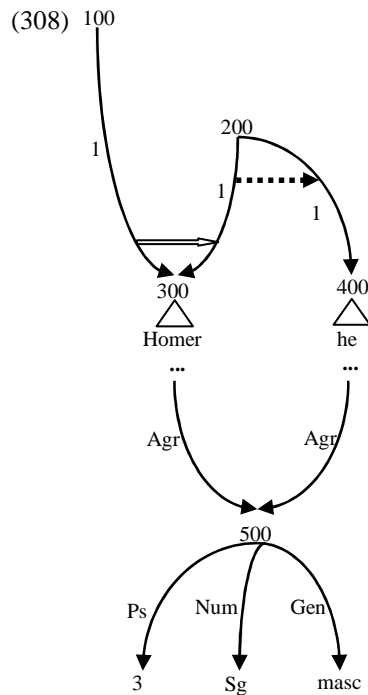
As can be seen, the Agr-arcs of *he* and *Homer* overlap; therefore, the two elements are specified for the same φ-features. Under this perspective, φ-feature agreement in general boils down to laws *requiring* overlapping Agr-arcs.

The exact formulation of these conditions for the connection between proforms and their antecedents is not so straightforward though. First, the law demanding φ-feature agreement between a proform and its antecedent cannot be one that simply demands that a proform *always* agree with its antecedent. What one has to demand is that a proform agrees with its antecedent if they *can* agree. In order to make this issue understandable, consider (309).

(309)   Homer geht oft   in Kneipen$_i$ weil   er da$_i$ gerne Bier trinkt.
        Homer goes often in pubs   because he there readily beer drinks
        Homer often goes to pubs because he likes drinking beer there.

---

[72] The analysis is similar to the analysis for agreement adopted in HPSG, which analyzes it in terms of feature sharing (cf. Pollard & Sag 1994, ch. 2).

In this sentence, *Kneipen* is the antecedent for the proform *da*. Consequently, *da* heads a replacer arc, and more specifically, one labeled 'Loc'. Importantly, *da* does not agree with any of the φ-features specified on *Kneipen*, which is specified for feminine gender and plural. Yet the sentence is grammatical. That *da* does not agree with *Kneipen* is not a surprise because it is a particle and particles are never specified for φ-features, and therefore can't agree either. So what has to be guaranteed is that φ-feature agreement has to obtain only when it can be obtained in the first place. Since particles are never specified for φ-features, their 'failure' to agree in φ-features must not count as a violation of the condition requiring φ-feature agreement. Second, the condition regulating the φ-feature agreement between proform and antecedent has to pick out the right set of φ-features. Consider the sentences in (310).

(310)   Homer geht am liebsten zu [Moe's Taverne]$_i$ weil   sie$_i$/er$_{*i}$ so sauber ist.
        Homer goes on nicest   to Moe's tavern   because she he so clean is
        Homer prefers going to Moe's tavern because it is so clean.

The sentence shows that if *Moe's Taverne* antecedes a proform that can agree, then this proform has to be *sie* and not *er*. Intuitively, this is straightforward because *Taverne* is marked for feminine gender and singular just like the proform *sie*. However, the relevant question is how to guarantee that it is the φ-features of *Taverne* that are targeted and not the φ-features specified on *Moe's*, viz. masculine and singular, resulting in the choice of *er*. Therefore, simply requiring that some φ-features of the antecedent are shared by the proform that replaces it is not sufficient, one has to ensure that it is the right set of φ-features.

In order to control both issues, the law demanding φ-feature agreement between a proform and its antecedent specifies an additional condition whose effect is to constrain φ-feature agreement to only those cases where it can be obtained. This condition I call *Agr(ee)-Control*, and its preliminary definition is provided in (311).

(311)   Def.: *Agr-Control (First Version)*
        Agr-Control (A,C) ↔ ∃B (Branch (B,A) ∧ Branch (C,B) ∧ Basic-Arc (A) ∧
        POS-Arc (B) ∧ Agr-Arc (C))

This condition relates a basic-arc A to the Agr-arc C of the basic-arc's POS-arc branch B, as shown in (312).

(312)
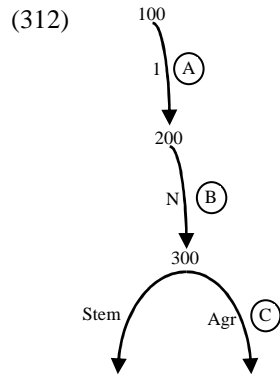
Equipped with this condition, the law ensuring φ-feature agreement between a proform and its antecedent can be formulated, as shown in (313).

(313) *The Pro Arc Overlap Law*
        Replace (A,B) $\land$ Agr-Control (A,C) $\land$ Agr-Control (B,D) $\rightarrow$ Overlap (C,D)

Informally speaking, this law says that a proform agrees with its antecedent in φ-features only if both the proform and the antecedent are specified for φ-features. Now consider how this law deals with the sentences in (309) and (310), whose partial structures are given in (314) and (315), respectively.

(314)

(315)

Consider first structure (314). The proform *da* corresponds to the replacer arc A mentioned in the Pro Arc Overlap Law, and the antecedent *Kneipen* counts as the replacee B specified in that law. The reason why the connection between the two elements is well-formed is that the Pro Arc Overlap Law only demands overlapping Agr-arcs, and therefore φ-feature agreement, between two arcs that are specified for φ-features in the first place. Since the particle *da* is not specified for such features, it does not satisfy the condition that it has to Agr-control an Agr-arc, and is therefore excluded from the scope of this law. Turning to the structure in (315), the antecedent *Moe's Taverne*, whose label is 'Dir', corresponds to the replacee B from (313), and the proform *sie* corresponds to the replacer arc A from (313). The reason why only the φ-features of *Taverne* are relevant for φ-feature agreement and not the ones of *Moe's* is an effect of the definition of Agr-Control. For Agr-Control connects a basic-arc to the φ-features specified under its POS-arc branch. The POS-arc branch of the Dir-arc corresponding to *Moe's Taverne* is the N-arc where the element *Taverne* is specified. Consequently, the φ-features of proform have to overlap those of the element *Taverne*, which is feminine singular. That the φ-features of *Moe's* are irrelevant is due to the fact that this element is not a POS-arc branch of the Dir-arc but a Mod-arc. Consequently, this arc is invisible for φ-feature agreement in this case, as desired.

Although the law in (313) gives the desired result in many cases, it is not yet fully sufficient. Consider the sentences in (316).

(316) a. Den   Professor$_i$, sie lobten ihn$_i$/ sie$_{*i}$.
          the.MASC professor, they praised him her
          The professor, they praised.

     b. Mit Peter$_i$, mit dem$_i$/der$_{*i}$ haben sie den ganzen Abend   getrunken.
          with Peter with him her   have they the whole   evening   drunk
          Peter, they drank all night with.

In both sentences, a flagged constituent is left dislocated, that is, an element is extracted and the extraction is accompanied by an extracted resumptive proform. Importantly, this proform has to agree in φ-features with the extracted constituent. This state of affairs is so far not covered by the condition of Agr-Control. To see why, consider the abstract partial structure underlying (316b).

(317)
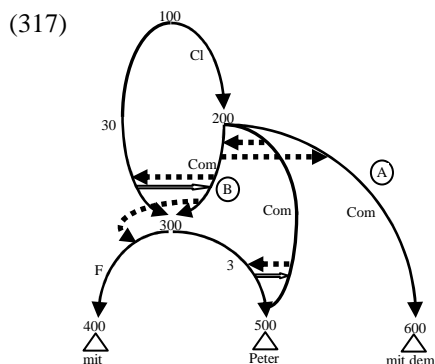
The replacee B mentioned in (313) is a closure arc in this structure, viz. one that is labeled 'Com'. The question is whether this closure arc satisfies the definition of Agr-Control and whether therefore the replacer B has to agree with A. The answer is no. For the branch of the closure arc is not a POS-arc but another basic-arc. Consequently, the closure arc does not satisfy the condition an Agr-Control and one expects that a proform connected to a flagged constituent can be specified for arbitrary φ-features. This is of course an undesired result. In order to achieve the right result, the definition of Agr-Control needs a slight revision, as shown in (318).

(318) Def.: *Agr-Control (Final Version)*
       Agr-Control (D,C) ↔ ∃A∃B (Branch (B,A) ∧ Branch (C,B) ∧ Basic-Arc (A)
       ∧ POS-Arc (B) ∧ Agr-Arc (C) ∧ R-Sponsor (A,D))

This definition is similar to the one in (311), but differs from it in that not only basic-arcs themselves are connected to their Agr-arcs but also all arcs sponsored by this basic-arc. So according to the new definition, all three arcs A, D, and E in (319) satisfy the new version of the definition of Agr-control, and are therefore connected to the Agr-arc C.

(319)
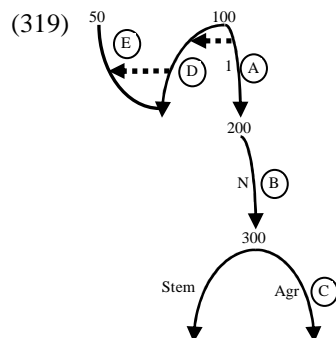
Arc D is connected to the Agr-arc C for obvious reasons: D is sponsored by A, which is a basic-arc, A has a POS-arc branch B, and B has as its branch the Agr-arc C. Arc A is still connected to the Agr-arc C because the new definition mentions 'R-sponsor'. As specified in chapter 5, any relation prefixed by 'R' is reflexive, which with respect to (318) means that the arc D R-sponsored by A is A itself. Moreover, any relation prefixed by 'R' is also transitive. Therefore, arc E is also connected to the Agr-arc C because it is sponsored by an arc, viz. arc D, that is sponsored by an arc, viz. arc A, that is connected to the Agr-arc C.

The analysis for φ-feature agreement obtaining between a proform and its antecedent is nearly complete. The final issue that needs to be taken into consideration is the structure of proforms. What has been achieved so far is that a replacer and a replacee agree. This means that the Agr-arcs specified as branches of the POS-arcs belonging to replacer and replacee overlap. However, proforms are analyzed as D-arcs internal to the replacer arc. And nothing so far guarantees that the Agr-arc internal to the D-arc overlaps the Agr-arc of the replacer itself. To make

this abstract discussion a bit more clear, consider first the more detailed version of the structure from (308), illustrated in (320).

(320)
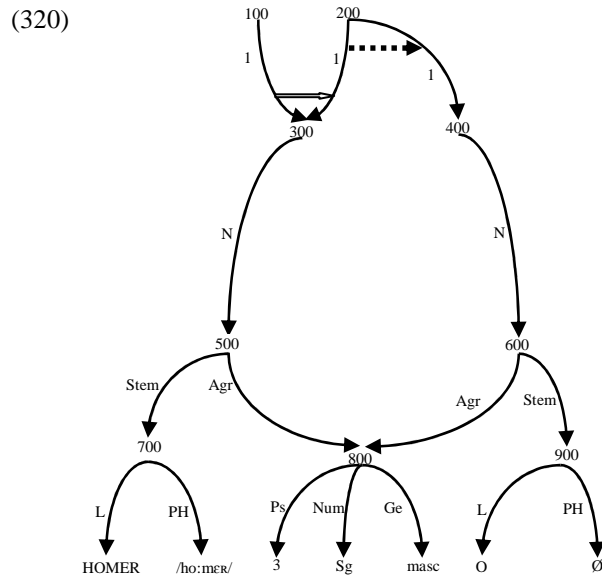
What has been achieved so far is the structure in (320); what needs to be guaranteed as well however is that this structure has to eventually look as in (321).

(321)
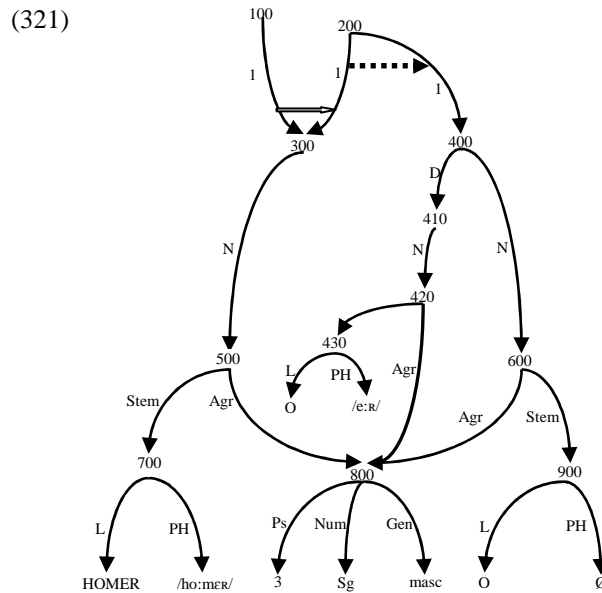
In this structure, three Agr-arcs overlap. The first one belongs to the antecedent. The other two belong to the proform. One of them belongs to the empty noun contained inside a proform; the other one belongs to the D-arc containing the proform *er* itself. Luckily, the agreement in φ-features obtaining between the D-arc and its supporting basic-arc can be guaranteed without recourse to some mechanism specific to the connection between a proform and its antecedent. For what is at stake in (321) is the effect of a general rule at work in German, viz. that an article has to agree with the nominal it belongs to. This rule is formulated in (322).

(322) *D-Arc Overlap Law*
  D-Arc (A) ∧ Branch (A,B) ∧ Basic-Arc (B) ∧ Agr-Control (A,C) ∧ Agr-Control (B,D) → Overlap (C,D)

This rule not only guarantees the overlapping of the two Agr-arcs, it guarantees that articles generally agree with the nominal they belong to, illustrated in (323).

(323) a. der   /*die   Mann
       the.MASC   the.FEM   man.MASC
       the man
   b. der   /*die   Frau
       the.MASC the.FEM   woman.FEM
       the woman

The structures for the grammatical versions of the nominal constituents in (323) are given in (324) and (325), respectively.
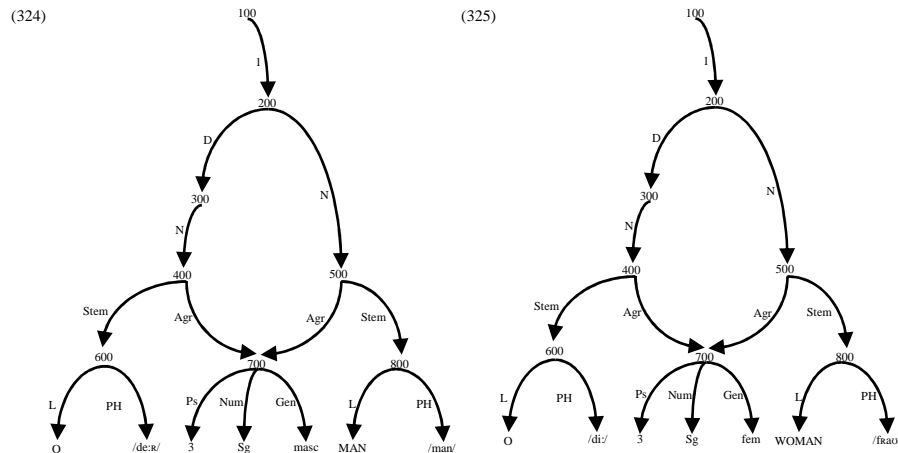
Equipped with the Pro Arc Overlap Law and the D-arc Rule Overlap Law, one can immediately account for φ-feature agreement obtaining between the resuming element and the extracted element in wh-copying. Consider the sentences in (326).

(326) a. **Welchen**　　**Mann** glaubst du <u>wen</u>　　　sie t liebt?
　　　　which.MASC.SG man　think　you who.MASC.SG she loves
　　　　Which man do you think she loves?
　　 b. **In welchem**　　**Haus** glaubst du <u>in dem</u>　　　er t wohnt?
　　　　in which.NEUT.SG house believe　you in that.NEUT.SG he　lives
　　 c. **In welchem Haus** glaubst du　<u>wo</u>　　er t wohnt?
　　　　in which　house believe you where he　lives
　　　　In which house do you think he lives?

The relevant task is to show that the two laws guarantee that the resuming element
has to agree in φ-features with the extracted element in (326a) and (326b), and that
the failure to agree in φ-features in (326c) is not fatal. And luckily, the two laws
guarantee this, for the wh-copying cases are basically identical to the cases already
discussed. Consider first the relevant substructure for (326a), shown in (327).

(327)
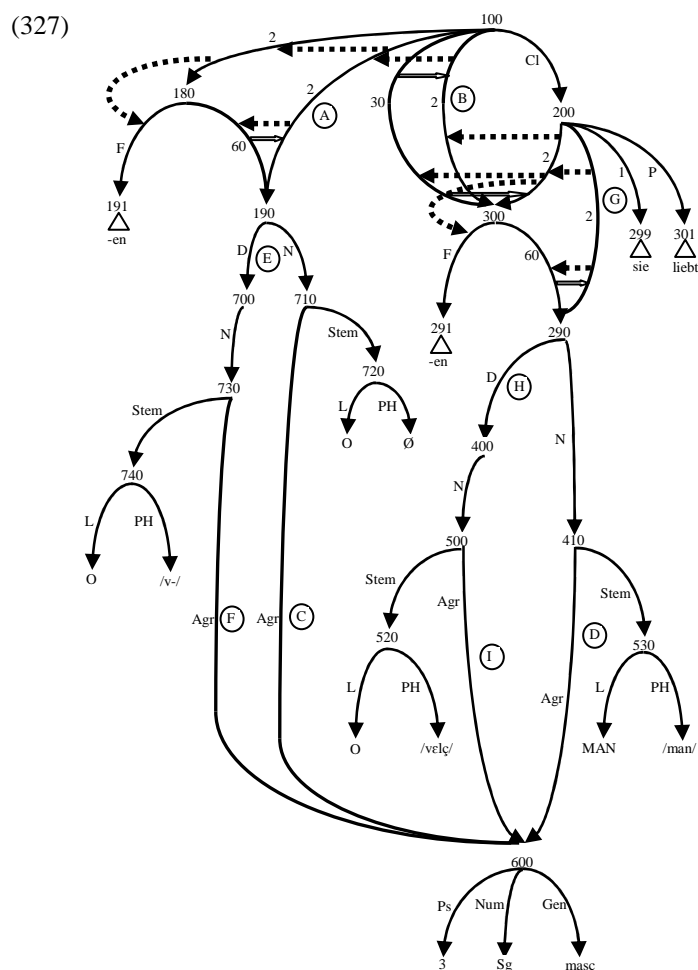
This structure represents only the substructure corresponding to the embedded clause. The reason why the resuming element (arc A) has to agree in φ-features with the extracted element (arc B) is because they fall in the scope Pro Arc Overlap Law. Arc A replaces B, arc A satisfies the definition of Agr-Control (it Agr-controls arc C), as does arc B (it Agr-controls arc D). Therefore, C and D have to overlap. Similarly, the reason why the D-arc E agrees with A is because they fall under the scope of the D-Arc Overlap Law. E is a D-arc, a branch of A, and both A and E satisfy the definition of Agr-control (A Agr-controls C, and E Agr-controls F). Consequently, C and F have to overlap, as is the case in (327). For the same reason, the D-arc H internal to the extracted element has to agree with it because H is a branch of G, both H and G satisfy the definition of Agr-Control (H Agr-controls I, and G Agr-controls D), so they have to overlap. This account carries over in a completely parallel way to the structure for (326b), shown in (328). The only difference are the associated flagging structures, which are of no relevance however.

(328)
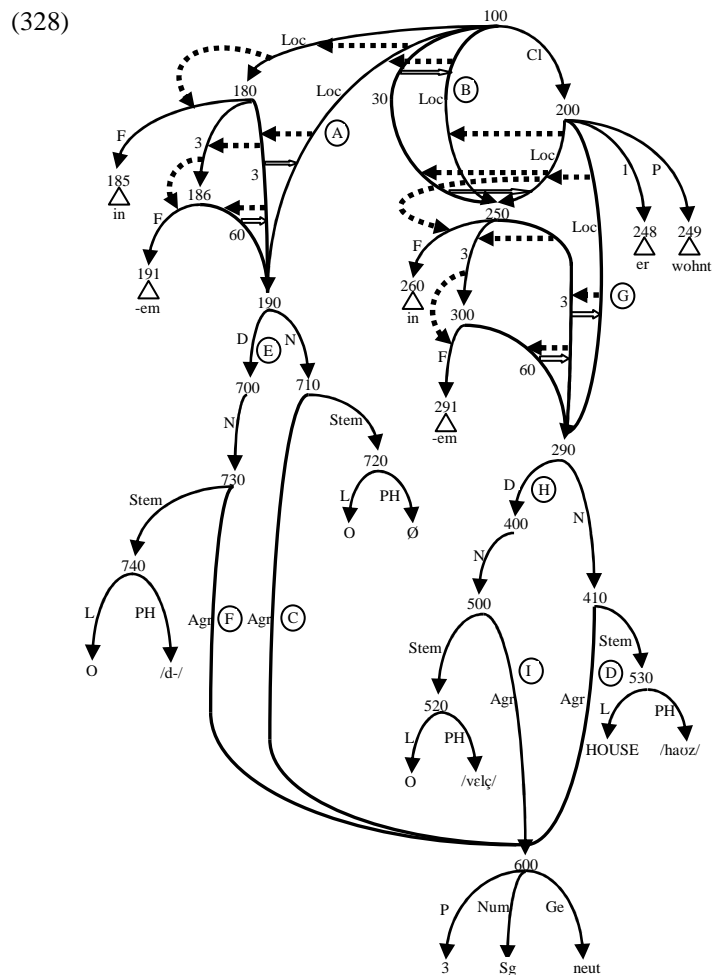
The more interesting case is the structure for (326c), provided in (329).

(329)
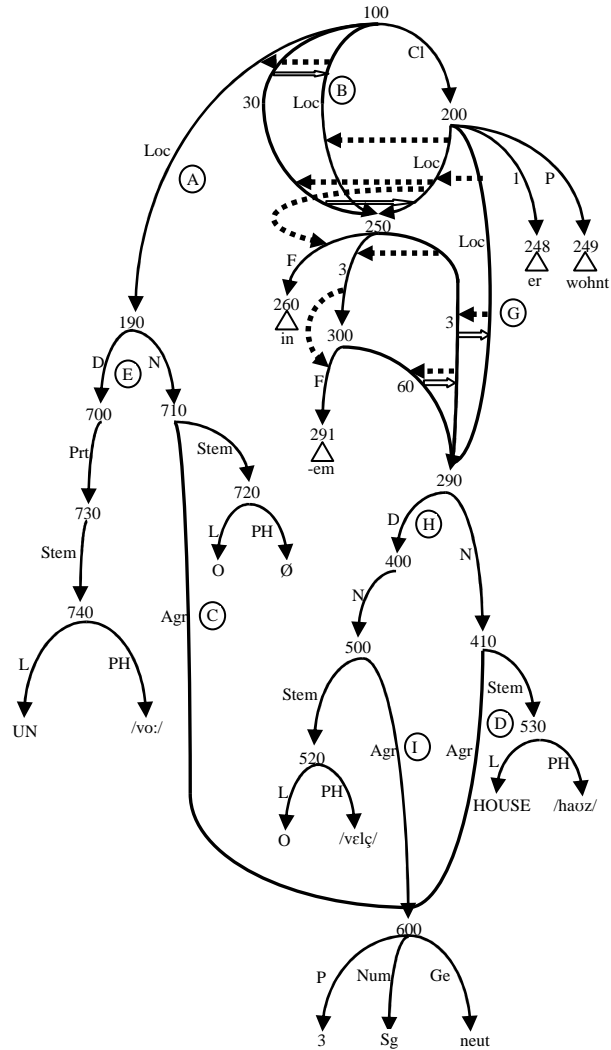
What makes this case interesting is that the resuming element and the extracted element superficially do not agree but still have overlapping Agr-arcs, as shown in (329), where the arcs C and D overlap, parallel to the structures in (327) and (328). The reason why this is no problem is because the Agr-arc internal to the resuming element overlapping the Agr-arc of the extracted element belongs to the empty, that is, unrealized nominal. Importantly, the element that is realized as the resuming element is the element specified internal to the D-arc of the resuming element. And this element is a particle. Since particles don't satisfy the definition of Agr-Control, the D-arc E need not agree with its supporting arc A because the D-Arc Overlap

Law is only relevant for those cases where the two arcs do satisfy the definition of Agr-Control. Consequently, (326c) is well-formed for the same reason that (309) is well-formed: φ-feature agreement can only obtain when it is possible in the first place. This is not the case in either (309) or (326c), therefore both are grammatical.

Before closing this section, I want to point to two specific benefits of this analysis for φ-feature agreement with respect to the analysis of wh-copying[73]. The first benefit has to do with the idea that φ-feature agreement in general is based on overlapping Agr-arcs. The benefit is that it can easily deal with the *ineffability* issue mentioned in chapter 3. The term ineffability refers to the fact that certain wh-copying structures are impossible to express, for example the ones in (330).

(330) a. **Welche Frau**   glaubst du ___ er t eingeladen hat?
           which   woman.MASC.SG believe you   he invited   has
           Which woman do you think he has invited?
       b. **Welche Männer/Frauen/Kinder** glaubst du ___ er t eingeladen hat?
           which   men/   women/ children believe you   he invited   has
           Which man/women/children do you think he has invited?

As shown in chapter 3, no wh-copying sentence based on a wh-proform as a resuming element is possible in (330) because no wh-proform exists that is specified for feminine gender (as required in (330a)) or plural (as required in (330b)), which is due to the defective paradigm for wh-pronouns, shown in table 2.

	SG			PL
	MASC	FEM	NEUT	
NOM	*wer*	-	*was*	-
ACC	*wen*	-	*was*	-
DAT	*wem*	-	*was*	-

Table 2: paradigm for wh-pronouns

This ineffability issue is of no problem for the approach to φ-feature agreement based on overlapping arcs. This is so because every wh-pronoun that occurs in the structure for (330) has to satisfy two requirements simultaneously. First, the wh-pronoun has to satisfy the Pro Arc Overlap Law and the D-Arc Overlap Law. And second, the wh-pronoun has to be a legal element in the first place. But no wh-

---

[73] Apart from these two specific benefits, there is a more general one which I would like to sketch very briefly. This benefit has to with Pro arcs that are connected to clauses as antecedents, as for example in cases of clausal extraposition. Since the antecedents is a clause, it lacks φ-features altogether, and parochial rules are needed to specify the φ-features of the proform heading the Pro arc. Consequently, it is expected that languages differ with respect to their choice of φ-features for this proform. And this is in fact what is found. For whereas Welsh choses a feminine marked proform (cf. ia), French choses a masculine marked one (cf. ib), and English a neuter marked one (cf. ic).

(i) a. Mae *e/√**hi** 'n   amlwg [s bod Mair wedi dod   yn ôl].
         is   he she PROG obvious   be Mair PERF come.INF back

                                                        (Borsley et al. 2007, p. 61, ex. 98)

     b. √**Il**/* **elle** est evident [s que Marie soit   rentrée].
         he she is obvious   that Marie was.SUBJ returned
     c. *He/*she/√it is obvious [s that Mary has come back].*

pronoun can satisfy both requirements at the same time. If one of the wh-pronouns from table 2 were present in the structures in (330), then the second requirement would be fulfilled, but the first one would not. But in order to satisfy the first requirement, a wh-pronoun would have to occur that is not a legal element, as no element with the relevant φ-feature specification exists in German. In sum, the ineffability effects observed in the case of wh-copying reduce to what is generally held responsible within the APG framework for the ungrammaticality of a structure, viz. the failure to satisfy all the laws and rules of a grammar.

The second benefit of this analysis is that it can easily account for the observation made in chapter 3 that it is the head noun of the extracted element that controls the φ-features on the resuming element. The relevant data supporting this claim are repeated in (331).

(331) a. **Wessen Mann**   glaubst du <u>den</u>   er t eingeladen hat?
           whose   man.MASC.SG believe you who.MASC.SG he invited   has
           Whose husband do you think he has invited?
       b. **Wessen Frau**   glaubst du <u>die</u>   er t eingeladen hat?
           whose   woman.FEM.SG believe you who.FEM.SG he invited   has
           Whose woman do you think he has invited?
       c. **Wessen Kind**   glaubst du <u>das</u>   sie t abgeholt   hat?
           whose   child.NEUT.SG believe you what.NEUT.SG she picked.up has
           Which child do you think she has picked up?
       d. **Wessen Männer/Frauen/Kinder** glaubst du <u>die</u>   er t eingeladen hat?
           which   men/   women/ children believe you who.PL he invited   has
           Whose husbands/wives/children do you think he has invited?

Importantly, the shape of the possessive wh-determiner *wessen* is fixed, indicating that it is a particle (cf. fn. 17 of chapter 3). Nevertheless, φ-feature agreement obtains between the extracted element and the resuming element. Since *wessen* cannot be the source for the φ-features on the resuming element (as *wessen* isn't specified for φ-features in the first place), only the head noun remains as the source for φ-feature agreement. Given the analysis I presented above, this follows without further saying, and importantly, without recourse to the idea that *wessen* contains unexpressed φ-features. This is so because φ-feature agreement between the extracted element and the resuming element is the result of two requirements. First, the nouns internal to both the extracted element and the resuming element have to agree in φ-features, and secondly, determiners have to agree in φ-features with their nouns in general, if they can. With respect to (331a) for example this means that *Mann* and the empty noun internal to *den* agree, and that then *den* has to agree in φ-features with this empty noun. If *den* agrees in φ-features with the empty noun, and if the empty noun agrees in φ-features with *Mann*, then *den* also agrees in φ-feartures with *Mann*, as desired. That *wessen* does not agree in φ-features with *Mann* is not fatal because φ-feature agreement is required only if it can obtain in the first place; and since *wessen* is a particle, φ-feature agreement between it and *Mann* cannot obtain and therefore need not obtain.

6.7.3   Conclusion

In sum, what I have shown in this section is that φ-feature agreement between the extracted element and the resuming element follows from general syntactic laws which require a proform to agree in φ-features with its antecedent, if they can. Since the connection between the extracted element and the resuming element is a special case of the connection between a proform and its antecedent, the connection between them is subject to this requirement as well. Moreover, I have also shown that the specific tool to express φ-feature agreement, viz. overlapping Agr-arcs, is also capable of dealing with the ineffability problem and the observation that it is the head noun of the extracted element that controls φ-feature agreement, and not its determiner.

6.8   The APG Analysis for the Choice of Proforms

6.8.1   Introduction

The analysis for the resuming element presented so far has already accomplished a number of things. Via the German Wh-Copying Rule, it is guaranteed that the resuming element is a proform and that it occupies a clause left peripheral position. Additionally, it is also ensured that the resuming element agrees with the extracted element in case and prepositional marking, and that it can be an adverb even when connected to a PP. Finally, I have shown in the previous section why the extracted element and the resuming element have to agree with each other in φ-features.

Despite this success, the analysis for the resuming element has a serious defect. The resuming element is a proform, and proforms are analyzed as article-like elements, that is, as elements appearing under D-arcs. Inspecting the inventory of elements that can appear under D-arcs, it turns out that German, similar to many other languages, possesses many such elements. Not only are there four different types of proforms (personal pronouns, adverbial proforms, reflexive pronouns, and wh-proforms), there are also many varieties of determiners (indefinite, quantificational, demonstrative, possessive, wh-, and definite determiners), as illustrated in (332).

(332) (i) proforms
            a. personal pronouns
                er/sie/es, *sie* (he/she/it, they)
            b. adverbial proforms
                da; *dann*; *damit*; *darauf*; etc. (there, then; with.it; on.it)
            c. reflexive pronouns
                sich (-self)
            d. wh-proforms
                wer/-/was, - ; *wo*; *wann*, etc. (who/what; where; when)

    (ii) determiners
        a. indefinite
            ein/eine/ein, - (a)
        b. quantificational determiners
            -/alle/alles, *alle*; *jeder/jede/jedes*, - ; etc. (all; every)
        c. demonstrative determiners
            dieser/diese/dieses, *diese*; *jener/jene/jenes*, *jene* (this; that)
        d. possessive determiner
            sein/ihr, *ihr* (his/her, their)
        e. wh-determiners
            welcher/welche/welches, *welche*; *was für ein/eine/ein*, *was für* (which, what (a))
        f. definite
            der/die/das, *die* (the)

The defect of the analysis for the resuming element as stated so far is that all the elements listed in (332) are permitted as resuming element, for all of them head D-arcs. This is a serious defect because as a matter of fact, only a proper subset of these elements is permitted. And as argued in chapter 3, this set is by and large[74] identical to the set that is used for free relative clauses. This set comprises (i) most wh-proforms[75], and (ii) some d-proforms, viz. the set of definite determiners. D-proforms are all proform-like elements starting with a *d-*, that is, definite determiners and adverbial proforms, but that out of this set adverbial proforms are *not* permitted as resuming elements.

Consequently, the question why only free relative proforms are permitted as resuming elements boils down to the question what picks out wh-proforms and definite determiners as the only elements that can appear as free relative proforms and as resuming elements[76]. The answer I give in this section is that only wh-proforms and definite determiners match the structural context in which resuming elements and free relative proforms appear, and that all the other candidates listed in (332) don't match the required contexts.

The remainder of this section is organized as follows. In section 8.2, I first explicate the notion 'structural context', repeat the structural context in which the resuming element has to appear and introduce the structure of free relative clauses in general and the structural context for the proform that has to be present there in particular. Given these two structural contexts, I then discuss in section 8.3 the structural contexts required by the elements listed in (332) and show that only the structural contexts required by wh-proforms and definite determiners match the structural

---

[74] See chapter 3, section 8, for the one exception to this generalization, viz. the wh-proform *weswegen* (Engl. why), which is permitted as free relative proform but not as a resuming element. Nevertheless, this does not affect the validity of the characterization of the resuming element as free relative proform. For this characterization only says that every resuming element has to be a free relative proform as well, but it crucially does not require the opposite. As this does not affect the main point I want to make in this section, I ignore this complication.

[75] Except for reason and conditional wh-proforms; cf. chapter 3, section 8, for details.

[76] Alternatively, one could analyze embedded clauses containing the resuming element as free relative clauses; then, the presence of a free relative poses no challenge. But as shown in chapter 3, section 6, the embedded clause containing the resuming element shows no sign of being a free relative clause.

contexts required by the resuming element and the proform required in free relative clauses.

A final caveat: I only deal with third person proforms here as only they are of interest for the analysis of the resuming element, which is always third person.

6.8.2 Structural Contexts

6.8.2.1 The Structural Context of Proforms

The general idea underlying the analysis I develop is that wh-proforms and definite determiners are used as both resuming elements and free relative proforms because only they match the structural contexts required by both. What I mean by structural context of a proform (or determiner) is the set of arcs 'surrounding' the D-arc under which a proform (or determiner) appears. This set includes (i) the neighboring N-arc, (ii) the support of the D-arc, (iii) and arcs R-sponsored by this support, as illustrated in (333).

(333)
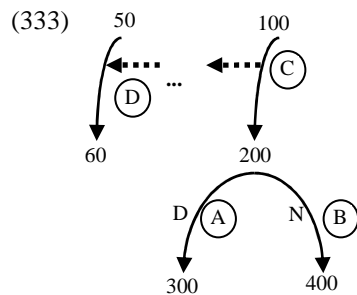
In (333), arcs B, C, and D are the D-arc A's structural context: B is A's neighboring N-arc, C is A's support, and D is an arc R-sponsored by C. I show in the remainder of this section that each type of proform (or determiner) puts restrictions on the context it requires, demanding for example a special type of support, a special type of neighboring N-arc, or putting restrictions on the set of possible R-sponsors of its support. Based on this investigation, I argue that only the structural context required by wh-proforms and definite determiners matches the structural context of the resuming element and that of a free relative proform. In order to show this, I need first specify these structural contexts required by a resuming element and a free relative proform, which I do in the following subsection.

6.8.2.2 The Structural Context of the Resuming Element

The structural context of the resuming element in (334) is defined by the arcs B and C, as illustrated in (335).

(334) **Welchen Mann** glaubst du   <u>wen/den</u> sie t eingeladen hat?
which   man   believe you who who she invited   has
Which man do you think she has invited?

(335)
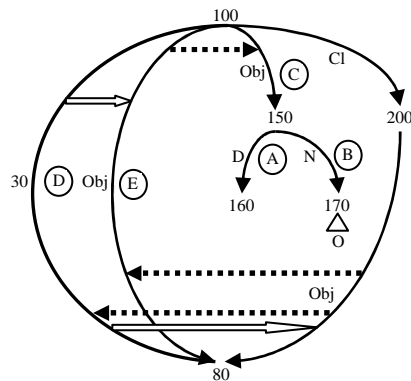
This structure should be familiar by now. The resuming element is defined by the
replacer arc C, which is a replacer to the relational marker E, and seconded by the
arc D, an overlay-arc labeled '30' that the relational marker C belongs to. The label
of the relational marker is specified for convenience as 'Obj', indicating that its label
belongs to the set of Object R-signs. Since a replacer is always equivalent to its
replacee, the replacer arc B is labeled 'Obj' as well. The resuming element proper
appears under the D-arc A, which is a neighbor of the N-arc B headed by a member
of Inexplicit (either O or UN).

6.8.2.3   The Structural Context of Free Relative Clause Proforms

What is more interesting for the analysis to follow is the structure of free relative
clauses. What I want to claim is that the structure of a free relative clause, such as
the one in (336a), is basically identical to the structure of a regular relative clause,
such as the one (336b).

(336) a. Ich küsse wen du t magst.
           I kiss who you like.
       b. Ich küsse den Mann den du t magst.
           I kiss the man who you like.

Before dealing with free relative clauses, I briefly discuss the structure of regular
relative clauses. Regular relative clauses involve a noun, the so-called *head noun*,
that is modified by a clause containing an extracted constituent, the so-called
relative proform. In addition to this, the head noun and the relative proform are
identical, in the sense that the referent of the head noun is identical to the element
referred to by the relative proform. In other words, in (336b), the man the speaker

kisses is the same man that the hearer knows. This identity requirement is captured structurally by having the N-arc of the head noun overlap the N-arc of the relative proform. This view entails that a relative proform contains a noun; as this noun is not visible in the relative proform, I assume that the N-arc of the head noun erases the head noun internal to the relative proform. The resulting analysis for the regular relative clause in (336b) is given in (337).

(337)
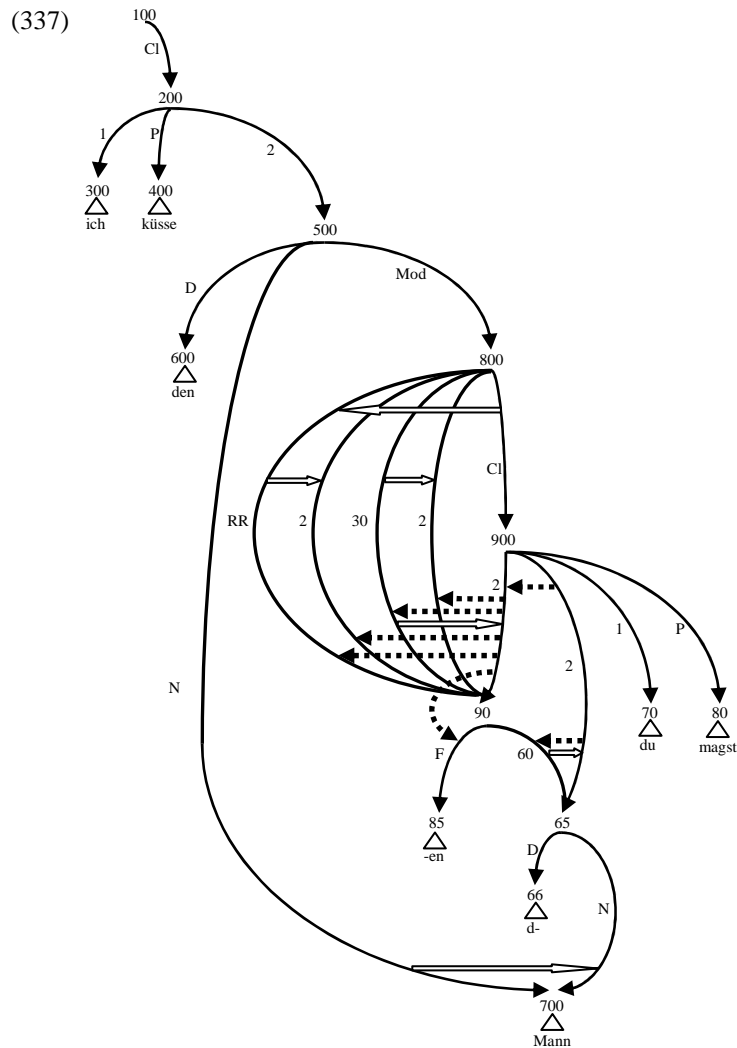
Let me briefly comment on this structure. Given the modifying function of relative clauses, I assume that relative clauses are clauses heading Mod-arcs, that is, arcs that bear some modifier-relation. This makes relative clauses functionally equivalent to attributive adjectives, the only difference between these two modifiers being their part-of-speech status. The N-arc neighboring the Mod-arc overlaps some N-arc

internal to the relative clause and erases it. The constituent to which the N-arc belongs (in 337, the 2-object) then undergoes extraction, which is modelled by letting it have an overlay-successor labeled 'RR', abbreviating 'restrictive relative'. I adopt a similar analysis for free relative clauses. What however distinguishes a free relative clause from a regular relative clause is the status of the head noun: it is a lexical noun in regular relative clauses, but one belonging to the set of Inexplicit in free relative clauses. In other words, the head noun in a free relative clause is either O or UN[77]. The structure for the free relative clause in (336a) is (338).

(338)

---
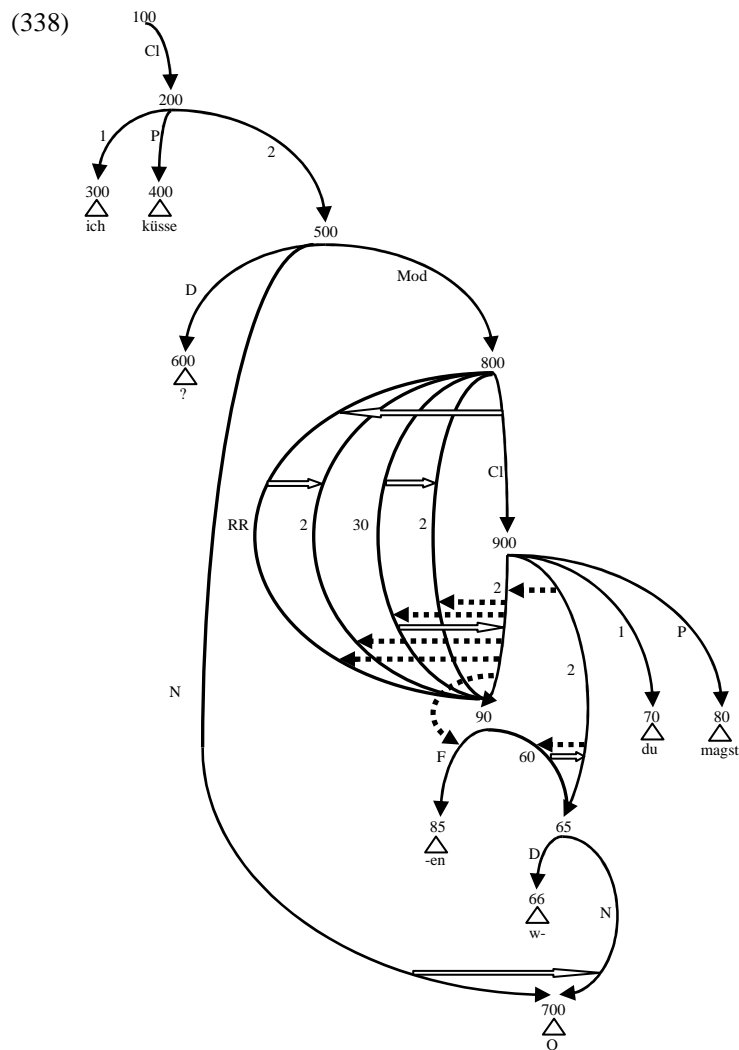
[77] There is another difference between regular relative clauses and free relative clauses that I however ignore in the remainder of this section, viz. the fact that the D-arc neighboring the Mod-arc is empty. I have so far no idea why this is the case.

This APG-analysis of relative clauses, which is similar to the so-called *matching analysis* in Generative Grammar (Chomsky 1965; Katz & Postal 1964; Salzmann 2006), embodies three claims. I first focus on the first two of these and then proceed to the third one, as the discussion of the third claim necessitates a discussion of the other two. The first one is that the relative proform in regular relative clauses is actually not a proform but a nominal constituent containing a lexical noun in disguise. The second one is that in free relative clauses, in contrast to regular relatives, the relative proform is in fact proform-like because the shared noun there is the same type of noun that is present in proforms, viz. either O or UN. I say 'proform-like' because the relative proform itself in free relatives is not a proform in the sense of section 6 because it does not head a replacer arc. This assumption is nevertheless compatible with the analysis of proforms from section 6 because although proforms are always headed by members of the set Inexplicit, the reverse does not hold: nothing bars these members to appear internal to initial arcs. Fortunately both claims are empirically supported by what Postal 1994a calls *antipronominal contexts*, hereafter ACs. Descriptively, ACs refer to contexts where a nominal constituent heading a lexical noun is required but not one heading a pronoun. Three cases of ACs from English are exemplified in (339) from English (cf. Postal 1994a).

(339) a. I painted my house √**that color**/***it**.
       b. There was √**a spider**/***it** in my soup.
       c. I fixed the car √**that way**/***it**.

The first case illustrates what Postal 1994a calls change of color contexts, the second case the well-known ban of definite pronouns from subject position in existential *there*-constructions, and the third case the prohibition of pronouns in environments for bare NP adverbials. German has a number of ACs too although they only partially overlap with the English cases. They are listed in (340) and documented in (341).

(340) (i)   idioms
       (ii)   inner objects
       (iii) manner adverbials
       (iv)   amount adverbials
       (v)   durational adverbials
       (vi)   locational adverbials

(341) (i)   idioms
       a. Er hat √**den Sack**/***ihn** zugemacht.   [den Sack zumachen]
           he has the bag   him closed.
           He put the lid on.
       b. Er hat mit √**seinen Pfunden**/***ihnen** gewuchert.   [mit seinen Pfunden wuchern]
           he has with his   pounds   them practiced.usury
           He showed off.

(ii)   inner objects
a.   Er geht √**den Weg**/***ihn**.
      he goes the way   him
      He takes that way.
b.   Er starb √**einen qualvollen Tod**/***ihn**.
      He died a painful death (*it).

(iii) manner adverbials
a.   Er spricht √**mit leiser Stimme**/***mit ihr**.
      he speaks   with quiet voice   with her
      He speaks quietly.
b.   Er läuft √**auf einer Hand**/***auf ihr**.
      He walks on one hand (*on her).
(iv)   amount adverbials
a.   Er misst   √**1,80m**/***sie**.
      he measures 1,80m   them
      He is 1,80m tall.
b.   Der Wagen erreicht √**200km/h**/***sie**.
      the vehicle reaches   200km/h   them.
      The car reaches 200km/h.
(v)   durational adverbials
a.   Es dauert √**ein Jahr**/***es**.
      It takes a year (*it).
b.   Er arbeitet √**ein Jahr**/***es** daran.
      He works a year (*it) on that.
(vi)   locational adverbials
a.   Er muss √**diese Straße**/***sie** abbiegen.
      he must this   street   her turn
      He has to turn at that street.
b.   Er wohnt √**in Berlin**/***darin**/***in ihm**.
      he lives   in Berlin it.in   in it
      He lives in Berlin.

Postal 1994a is silent about how to capture ACs theoretically. What I want to suggest is that ACs are characterized in the following way.

(342) *AC Characterization*
       An AC does not accept any arc A such that (i) one of A's R-branches labeled POS is headed by a member of Inexplicit and (ii) the D-arc branch of A has an N-arc branch[78].

For example, the sentences in (341va) have the simplified structures in (343) and (344).

---

[78] This second condition is inserted to guarantee that adverbial proforms do not create ACs, cf. (i).
(i) Er wohnt √**in Berlin**/√**da**.
     He lives in Berlin/there.

(343) and (344) diagrams:

```
(343)        100                      (344)        100
              |                                     |
             Cl                                    Cl
              ↓                                     ↓
             200                                   200
          1 / P | Dur                          1 / P | Dur
           ↓   ↓   ↓                            ↓   ↓   ↓
         300  400  500                        300  400  500
          △    △    △                          △    △    △
          es  dauert  D / N                    es  dauert  D / N
                     ↓   ↓                                ↓   ↓
                    600  700                              600  700
                     △    △                                △    △
                    ein  Jahr                              es   UN
```
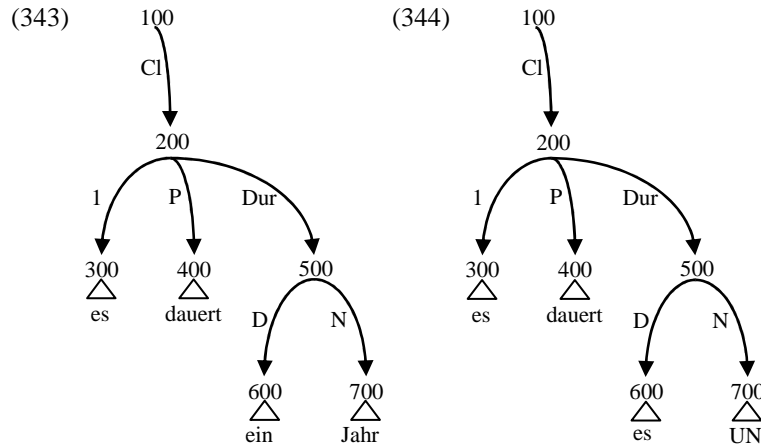
The predicate-arc *dauern* is constrained as to allow only for neighboring Dur(ation)-arcs whose POS-arc is not headed by UN or O, so it creates an AC. Given the diagnostics of ACs, and applying them to free and regular relative clauses, one makes the following prediction.

(345) *Free relative proforms are banned from ACs, regular relative proforms are not.*

This is so because regular relative clauses involve a relative proform that is in fact a nominal constituent with a lexical noun, whereas free relative clauses feature a relative proform that is proform-like. And in fact, this prediction is borne out, as the data in (346) and (347) reveal for free relative clauses and regular relative clauses, respectively.

(346) (i) idioms
   a. * Er hat zugemacht **wen** er t zumachen sollte.
        he has closed   what he close   should
        He put on what he was supposed to put on.
   b. * Er wuchert   **womit**/   **mit was** alle versuchen t zu wuchern.
        he practices.usury what.with with what all   try   to practice.usary
        He tries to show off with something that noone before tried to show off with.
   (ii) inner objects
   a. * Er ging **wen**/**was** die Schilder t auswiesen.
        he went what   the signs   demarcated
        He went what the signs demarcated.
   b. * Er starb **wen**/**was** der Arzt   ihm t prophezeit hatte.
        he died what   the doctor him predicted had
        He died what the doctor had predicted him.
   (iii) manner aderbials
   a. * Er spricht **mit was/ womit**   auch seine Brüder t sprechen.
        he speaks with what what.with also his   brothers spoke
        He speaks with what also his brothers speak.

b. * Er lief   **auf was**/ **worauf** eigentlich nicht viel   Gewicht t liegen darf.
        he walked on   what what.on actually   not   much weight   lie   should
        He walked on what must not be put weight onto.

(iv)   amount adverbials

a. * Ich messe   nun mal **was** ich t messe!
        I   measure now time what I   measure
        I am as tall I am!

b. * Der Wagen erreicht nicht **was** er t erreichen soll.
        the vehicle reaches not   what he reach   should
        The car doesn't reach what it is supposed to.

(v)   durational adverbials

a. * Das Stück dauert **was** ich auf das Essen warten musste.
        the play tooks what I   on the dish   wait   must
        The play lasted what I had to wait for my dinner..

b. * Ich arbeite **was** er t warten musste.
        I   work   what he wait   must
        I work what he has to wait for.

(vi)   locational adverbials

a. * Wir müssen abbiegen **was** t nach der Hauptstraße kommt.
        we   must   turn   what after the Hauptstraße comes
        We have get turn at the street which comes after Hauptstraße.

b. * Ich wohne **in was**/ **worin**   Hermann Paul t studierte.
        I   live   in what what.in Hermann Paul   studied
        I live where Hermann Paul studied.

(347) (i)   idioms

a.   Und Hermann mit dem weltberühmten Sack **den**   er hätte t zumachen können![79]
     and Hermann with the world-famous bag which he had   close   can
     And Hermann with the chance to decide the match!

b.   Man muss ja erstmal   Pfunde haben **mit denen** man t wuchern   kann[80].
     one must yes first.of.all pounds have   with which one   practice.usury can
     One needs something in the first place that one can show off.

(ii)   inner objects

a.   Der ganze Weg **den**   er t ging war falsch   ausgeschildert.
     the whole way which he went was wrongly signposted
     The whole route he took was wrongly signposted.

b.   Er starb einen Tod   **den**   ich nicht t sterben will.
     he died a   death which I   not   die   want
     He died a death that I don't want to die.

(iii)   manner aderbials

a.   Es ist anstrengend der leisen Stimme **mit der**   er t spricht zu folgen.
     it is exhausting   the quiet voice   with which he speaks to follow
     It's exhausting to follow the quiet voice with which he speaks.

b.   Die eine Hand, **auf der** er t lief, war sogar gebrochen!
     The one hand on which he walked was even broken!

---

[79] Heard on radio.
[80] Uttered by a colleague.

(iv) amount adverbials

a. Die 1,80m **die** er t misst   muss man erst einmal schaffen   mit 12 Jahren.
the 1,80 which he measures must one first.of.all accomplish with 12 years
The 1,80m he is tall is something hard to accomplish with 12 years.

b. Die 200km/h **die**   der Wagen t erreichen soll   schafft   er locker.
the 200km/h which the vehicle reach   should accomplishes he easily
The car reaches the 200km/h easily it is supposed to reach.

(v) durational adverbials

a. Das ganze Jahr **das** das t gedauert hat war ein verlorenes Jahr.
the whole year that it   took   has was a lost   year
The whole year that it took was a lost year.

b. Das Jahr **das** ich t daran gearbeitet habe ging schnell vorbei.
the year that I   on.it worked   have went quickly by
The year that I worked on it passed by quickly.

(vi) locational adverbials[81]

a. Die Straße **die**   wir t abbiegen müssen heißt   Poststraße.
the street which we turn   must   is.called Poststraße
The street at which we have to turn is called Poststraße

b. Die Stadt **in der**   ich t wohne heißt   Berlin.
the city in which I   live   is.called Berlin
The city where I live is called Berlin.

What these contrasts therefore show is that despite surface similarities, the relative proform in free relative clauses has a different status than the relative proform in regular relative clauses: it is a real proform in free relative clauses, whereas it is a full nominal constituent in disguise in regular relative clauses.

The idiom cases discussed in (347) allow us eventually to deal with the third claim of the analysis for relative clauses, which is that what is shared between the head noun and the relative proform is in fact only the noun and no other element, in particular no attributive adjective. In other words, in a sentence like (348), the adjective *schönen* (Engl. beautiful) is structurally represented only internal to the head noun, but not internal to the relative proform.

(348) Ich bemerkte einen schönen Mann **den** mir keiner t vorgestellt hatte.
I   noticed a   beautiful man who me no one introduced had
I noticed a beautiful man that no one had introduced me to.

---

[81] Groos & van Riemsdijk 1981, p. 176, note the following contrast.

(i) a. Das Buch liegt in der Schublade, **in der** auch die andern Bücher t liegen.
The book lies in the drawer in which also the other books lie.

b. * Das Buch liegt **in was**/ **worin** auch die andern Bücher t liegen.
the book lies in what what.in also the other books lie
The book lies in what also the other books lie.

They speculate that "German free relatives cannot, in general, be constructed with a PP in COMP" (p. 203), but they themselves note that this is too strong a claim (their fn. 25). Given the diagnostics of antipronominal contexts, the ungrammaticality of (ib) ceases to be a problem because *liegen* instantiates an antipronominal context as well.

(ii)*Das Buch liegt **in ihr**/**darin**.
the book lies in it   it.in
The book lies in there.

The argument supporting this claim comes again from idioms. Given the analysis that the adjective is not part of the relative proform, one makes two predictions. First, if an adjective is part of the head noun, and if only the real noun internal to the head noun allows an idiomatic interpretation internal to the relative clause, then this idiomatic reading internal to relative is expected to be retained. To make this arguably abstract prediction a bit more concrete, consider again the idiom in (349).

(349)   den Sack zumachen
        the bag close
        to put the lid on

The idiomatic interpretation of this constituent is lost if it is accompanied by an adjective.

(350)   den alten/grauen/weltberühmten   Sack zumachen
        the old   grey   world-famous   bag close
        to close the old/grey/world famous bag (NOT: to put the lid on)

Now consider again (347ia), repeated here as (351).

(351)   Und Hermann mit dem weltberühmten Sack **den**   er hätte t zumachen können!
        and Hermann with the world-famous bag which he had   close   can
        And Hermann with the chance to decide the match!

In this example, the idiomatic interpretation of this constituent internal to the relative clause is retained. Since the idiomatic interpretation of this constituent requires the absence of an adjective, the adjective *weltberühmt* is arguably not part the relative proform *den*, whereas the noun *Sack* is. The second prediction concerns constituents whose idiomatic interpretation is dependent on the presence of an adjective. One such example is given in (352).

(352)   zwei *(linke) Hände haben
        two   left   hands have
        to be all thumbs

If the NP of this constituent is relativized, one predicts that the idiomatic interpretation is lost internal to the relative clause because the adjective that makes this interpretation possible in the first place is lacking. This prediction is borne out.

(353)   Das sind die zwei linken Hände **die** ich habe t.
        that are the two left   hands who I   have
        Those are the two left hands that I have. (no idiomatic reading possible)

In sum, the APG analysis I adopt for relative and free relative clauses is well-supported both by antipronominal contexts and by idioms. Given this background, one can eventually deal with the question why the resuming element is a free relative proform.

6.8.3   Why the Resuming Element is a Free Relative Proform

In the previous subsection, I have shown the structural contexts in which the resuming element and free relative proforms occur; the relevant substructures are repeated for convenience in (354) and (355).

(354)

(355)
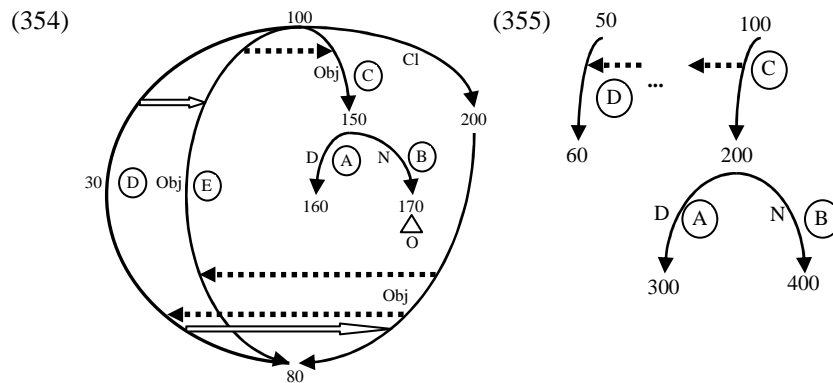
Equipped with both structures, the analysis of the third secondary property of the resuming element can be summarized as follows.

(356) *Only the structural context required by wh-proforms and definite determiners matches the structural contexts in (354) and (355).*

I proceed as follows in the remainder of this part. I first show why all elements other than wh-proforms and definite determiners are not permitted as resuming elements and free relative proforms. Inspecting their distribution, it turns out that they all require a structural context that is incompatible with (354) and (355). I then show why wh-proforms and definite determiners are permitted as resuming elements and free relative proforms. The reason is that they require a structural context that *is* compatible with the ones in (354) and (355), as I show by investigating their distribution in contexts other than free relative clauses or wh-copying.
I start by showing why *personal pronouns* are not permitted. The reason is relatively easy to specify. The core constraint regulating the distribution of personal pronouns in German is that they can't have an antecedent within the same clause, and if they have one outside their clause, then the pronoun must not be structurally higher than its antecedent. Translated into APG-terms, this means that personal pronouns put a restriction on their support. For what they require is that (i) this support is a replacer arc that must not have a neighboring seconder, and (ii) that the replacer must not arc-command the seconder. So, whereas the structure in (357) corresponding to (360a) is well-formed, the one in (358) corresponding to (360b) is not, because there the seconder *is* a neighbor of the replacer. Similarly, the structure in (359) corresponding to (360c) is ungrammatical because there the replacer does arc-command its seconder.

(357) ... (358) ... (359)
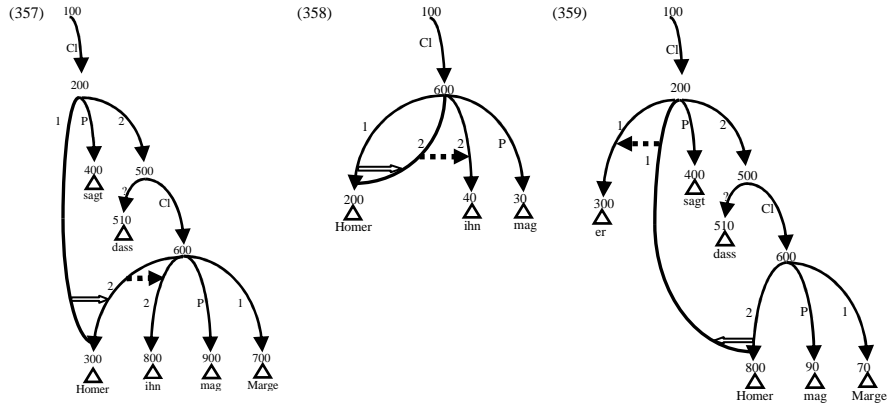
(360) a. Homer$_i$ sagt dass Marge **ihn$_i$** mag.
         Homer says that Marge him likes
         Homer says that Marge likes him.
      b.* Homer$_i$ mag **ihn$_i$**.
         Homer likes him
         Intended: *Homer likes himself.*
      c.* **Er$_i$** sagt dass Marge Homer$_i$ mag.
         he   says that Marge Homer likes
         Intended: *Homer says that Marge likes him.*

Expressed more formally, the rule sanctioning the occurrence of personal pronouns in German looks as in (361), where 'set 1' is a variable over the members of the set of personal pronouns. The general structure in which personal pronouns can appear is given in (362).

(361) *German Personal Pronoun Rule*[82,83]
      PH-Headed (A, Set 1) → ∃C∃E (D-Arc (A) ∧ Support (C,A) ∧ Replace (C,E)
      ∧ ∀D (Second (D,C) → ¬Arc-Command (C,D)))

---

[82] This rule and other ones to follow are vastly oversimplified because they only specify the structural contexts of proforms or determiners. This is an oversimplification insofar as each specific proform and determiner must also be specified for the flag with which it can co-occur, as well as the properties of the Agr-arc it belongs to. As this only complicates the formulation of the rules in an unnecessary way, I omit these specifications.

[83] Although this rule looks similar to Principle B of the Government and Binding framework, the rule differs from Principle B in that Principle B is a principle, that is, it is claimed to hold for all languages, whereas the German Personal Pronoun Rule is a rule, and therefore only specifies a language particular requirement. There are two arguments for rejecting the universal status of Principle B. First, there are languages where personal pronouns can have a clause-internal antecedent, viz. Frisian (cf. Reuland 2011). Second, as Postal & Ross 2009, fn. 2, point out, notions such as 'pronoun' or 'anaphor' have never been given any definitions; but then, it becomes impossible to define universal constraints for a set of elements whose members cannot be identified. This is not to deny that there are universal constraints on coreferential proforms; there are, for example the requirement that every such proform heads a replacer arc. But which proform is chosen in which context is determined by language particular rules, simply because each language has its own pronominal system.

(362)
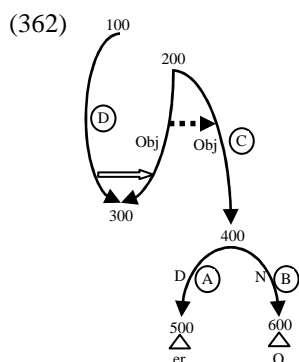
Given this rule, the non-availability of personal pronouns as resuming elements follows from the fact that personal pronouns require their support to be a replacer whose seconder is *not* a neighbor, as shown in (362), where the seconder D is not a neighbor of the personal pronoun's supporting arc C. However, the support of the D-arc containing the resuming element proper is a replacer that has to have a neighboring seconder, as the arc D in (354) shows, because a relational marker is always parallel to the overlay-arc it accompanies. As the two requirements are mutually incompatible, they can't be satisfied. Consequently, a personal pronoun can not function as a resuming element. The reason why personal pronouns cannot be free relative proforms either is equally easy to specify. The support of a personal pronoun is always a replacer, that is, the support is *never* an initial arc (cf. arc C in (362)), whereas a free relative proform *always* heads some initial arc (cf. arc C in (355)). Or to put it more technically: a personal pronoun is always a Pro arc and therefore always heads a replacer arc, whereas a free relative proform is never a Pro arc and therefore never heads a replacer arc.

This account for the exclusion of personal pronouns carries over in a parallel way to *adverbial proforms*. For they obey the same constraints as personal pronouns. They cannot have an antecedent internal to the clause they appear in, but only one outside of their clause, as exemplified in (363) and (364) for the adverbial proform *da* and the adverbial proform *darauf.*

(363) a.* Das Programm_i fand   **da**_i   einen Fehler.
          the programme found there a   mistake
          Intended: *The programme discovered a bug in itself.*
     b. Das Programm_i bestätigt dass Stefan **da**_i   einen Fehler   gefunden hat.
          the programme confirms that Stefan there a   mistake found   had
          The programme confirms that Stefan discovered a bug in it.

(364) a.* Das Gesetz_i kann auch **darauf**_i angewandt werden.
          the law   can also it.on   applied   become
          Intended: *The law can also be applied to itself.*
     b. Das Gesetz_i besagt dass alles   **darauf**_i angewandt werden kann.
          the law   states that everything it.on   applied   become can
          The law states that everything can be applied to it.

In addition, they can only have an antecedent that they don't arc-commanded.

(365) a. Stan sagte in [Langley Falls]ᵢ dass es **da**ᵢ am schönsten   ist.
           Stan said in Langley Falls   that it there at most.beautiful is
           Stan said in Langley Falls that it is the best place.
       b.* Stan sagte **da**ᵢ   dass es in [Langley Falls]ᵢ am schönsten   ist.
           Stan said there that it in Langley Falls   at   most.beautiful is
           Stan said there that Langley Falls is the best place.

(366) a. Stan sagte beim [CIA-Treffen]ᵢ dass keiner **damit**ᵢ zufrieden sein kann.
           Stan said at.the CIA meeting that no one it.with satisfied be   can
           Stan said during the CIA meeting that noone can possibly like it.
       b.* Stan sagte **dabei**ᵢ dass keiner mit   dem [CIA-Treffen]ᵢ zufrieden sein kann.
           Stan said it.at   that no one with the   CIA meeting   satisfied be   can
           Stan said during it that noone can possibly like the CIA meeting.

So the rule in (361) is at work also in the case of adverbial proforms, the only difference between personal pronouns and adverbials proforms being the grammatical relation their supports bear: the label of the support of a personal pronoun is restricted to central R-signs, whereas the label of the support of adverbial proforms is restricted to oblique R-signs. Consequently, the variable 'set 1' in (361) is a variable over both personal pronouns and adverbials proforms.

The exclusion of *reflexive pronouns* as resuming elements and free relative proforms is equally easy to explain. The basic constraint regulating the distribution of the reflexive pronoun *sich* in German is that it can only have an antecedent internal to the clause it appears in. Translated into APG terms, this means that the D-arc headed by *sich* must have as a support a replacer arc that (i) appears within some clause, and (ii) that is seconded by a neighboring arc. In other words, whereas the structure in (367) corresponding to (369a) is well-formed, the one in (368) corresponding to (369b) is not.

(367)

100
Cl
600
1 2 2 P
200 400 300
Homer sich mag

(368)

100
Cl
200
1 P 2
400 500
sagt ?
510 Cl
dass 600
2 2 P 1
300 800 900 700
Homer sich mag Marge
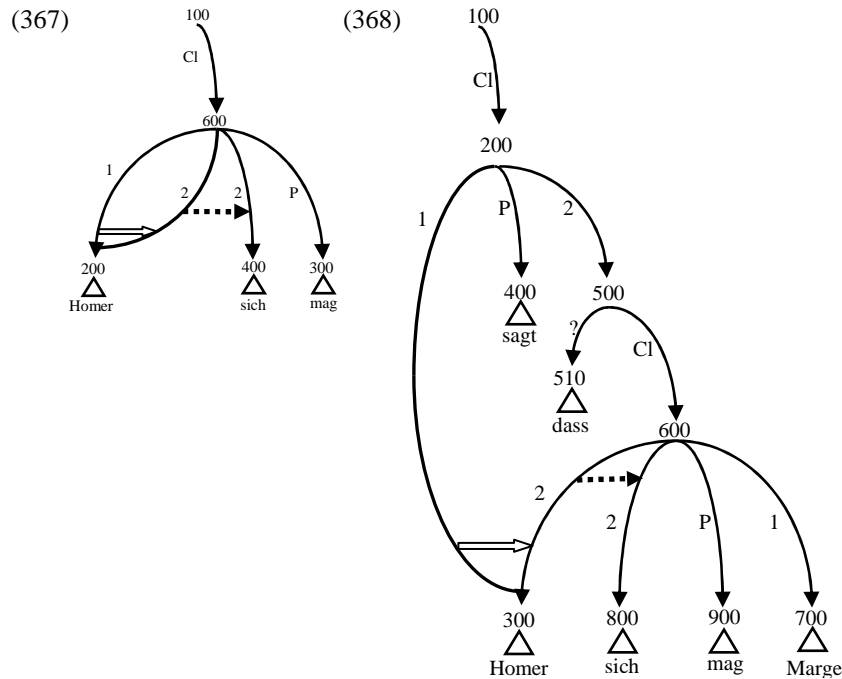
(369) a. Homer$_i$ mag **sich**$_i$.
Homer likes SELF
Intended: *Homer likes himself.*

b.* Homer$_i$ sagt dass Marge **sich**$_i$ mag.
Homer says that Marge SELF likes
Homer says that Marge likes him.

The contrasts in (363) and (364) illustrated for personal pronouns also hold for adverbial proforms, which further supports the view that adverbial proforms are similar to personal pronouns in their distribution.

(370) a. Das Programm$_i$ fand einen Fehler in **sich**$_i$.
the programme found a mistake in SELF
The programme discovered a bug in itself.

b.* Das Programm$_i$ bestätigt dass Stefan einen Fehler in **sich**$_i$ gefunden hat.
the programme confirms that Stefan a mistake in SELF found had
Intended: *The programme confirms that Stefan discovered a bug in it.*

(371) a. Das Gesetz$_i$ kann auch auf **sich**$_i$ angewandt werden.
the law can also on SELF applied become
The law can also be applied to itself.

b.* Das Gesetz$_i$ besagt dass alles auf **sich**$_i$ angewandt werden kann.
the law states that everything on SELF applied become can
Intended: *The law states that everything can be applied to it.*

The rule regulating the occurrence of the reflexive pronoun *sich* is given in (372), and the general structure in which it can appear is given in (373).

(372) *German Reflexive Pronoun Rule*
PH-Headed (A, sich) $\rightarrow$ $\exists C \exists E$ (D-Arc (A) $\wedge$ Support (C,A) $\wedge$ Replace (C,E)
$\wedge$ $\forall D$ (Second (D,C) $\rightarrow$ Neighbor (C,D) $\wedge$ Object-Arc (D)))

(373)
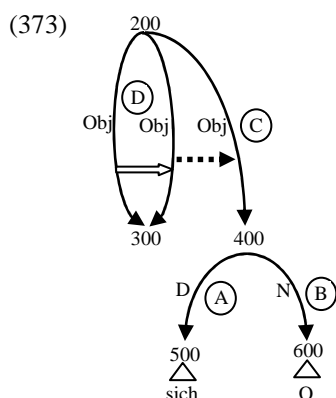
The reason that *sich* is not permitted as a resuming element follows from the requirement that the D-arc headed by *sich* has to be a replacer whose seconder is labeled by an Object R-sign, cf. arc D in (373). However, the seconder of the arc supporting the D-arc headed by the resuming element is never labeled by an Object R-sign, but by an overlay R-sign, viz. '30'. Therefore, since the requirement of *sich* on the seconder of its support is not satisfied in the structure in which the resuming element appears, *sich* is not permitted as a resuming element. The reason why *sich* is not permitted as a free relative proform is similar to the reason why personal pronouns and adverbial proforms are not permitted as free relative proforms: the D-arc headed by *sich* must be supported by a replacer arc (cf. C in (373)), whereas the D-arc headed by the free relative proform must not be supported by a replacer arc (cf. C in (355)).

I now turn to four types of determiners at the same time, viz. to *indefinite*, *quantificational*, *demonstrative*, and *possessive* determiners. The reason why these elements are excluded as resuming elements and as free relative proforms is only partially related to the restrictions they put on their supports. The other part has to do with restrictions put on the arcs that can be R-sponsored by their supports. Regarding the first part, all these four types of elements have in common that they specify some semantically relevant information. Indefinite determiners either introduce new referents, contrary to definite determiner, which simply mark a referent as pre-established, or they have quantificational force, similar to the existential quantifier *some* in English. Quantificational determiners (including the quantificational use of the indefinite determiner) specify which referents or how many referents have the property specified by a clause. And both demonstrative and possessive determiners restrict the set of referents specified by the nominal they

belong to. In order to guarantee the semantic visibility of D-arcs headed by these four types of elements, the supports of these D-arcs themselves have to be semantically visible. Translated into APG-terms, this means that all four types of determiners have to be visible in the L-Graph, and in particular, the D-arcs these determiners head have to have at least one support that is an initial arc. Regarding the second part, as a matter of fact, constituents containing these determiners have restricted extraction properties. Apart from some exceptions, they can be topicalized[84], left dislocated[85], and right dislocated, cf. (374).

(374) a. topicalization
           Einen/**jeden**/**diesen**/**meinen** Mann kenne ich t.
           a   every this   my   man   know I
           I know a/every/this/my man.
       b. left dislocation
           Einen/**jeden**[86]/**diesen**/**meinen** Mann, den kenne ich t.
           a   every this   my   man   who know I
           I know a/every/this/my man.
       c. right dislocation
           Ich kenne ihn, ***einen**/***jeden**/**diesen**/**meinen** Mann.
           I   know him, a   every this   my   man
           I know him, a/every/this/my man.

However, under no circumstances can such constituents undergo wh-question extraction or relativization, cf. (375).

(375) a. wh-question extraction
           * **Einen**/**jeden**/**diesen**/**meinen** Mann kennst du t.
           a   every this   my   man   know you
           Intended: *Which x is such that you know x and x is a/every/this/my man.*
       b. relativization
           * Peter sieht einen Mann, **einen**/**jeden**/**diesen**/**meinen** du auch t kennst.
           Peter sees a   man   a   every this   my   you also know
           **Peter sees a man a/every/this/my you also know.*

---

[84] By topicalization, I refer to the type of extraction that puts some constituent out of the middle field. I ignore that the information structural status this constituent is not necessarily that of a topic.

[85] By left dislocation, I refer to the extraction that puts some constituent out of the middle field and requires some resumptive pronoun, either in the middle field or outside of the middle field. Again, I ignore information structural impacts of this extraction, which marks the constituent either as topic or as a contrastive element.

[86] *jeden* can only be left dislocated if it is assigned a contrastive interpretation, cf. (i).

(i) A: Du hast doch nur zwei von den Männern gesehen!
         you have PRT only two of the men   seen
         You have seen only two of the men!
     B: Das stimmt nicht! **JEDEN** Mann, DEN hab ich gesehen.
         that sounds not   every man who have I seen
         That's not true! I have seen EVERY man.

Translated into APG terms, this means that these determiners must head D-arcs whose supports *never* R-sponsor an overlay-arc labeled 'WH' or 'RR'. Both requirements can be incorporated in the following way into the rule that sanctions the occurrence of the four types of determiners, as shown in (476), where 'set 2' is a variable over the members of the set of all the four types of determiners under discussion.

(376)   *German Indefinite/Quantificational/Demonstrative/Possessive Determiner Rule*
        PH-Headed (A, Set 2) → D-Arc (A) ∧ ∃C (Support (C,A) ∧ Initial Arc (C) ∧ ¬∃D
        (R-Sponsor (C,D) ∧ (WH-Arc (D) ∨ RR-Arc (D))))

This rule says that indefinite, quantificational, demonstrative, and possessive determiners are restricted to D-arcs that are supported by at least one initial arc. The restriction to only one initial branch is needed to guarantee that the constituents containing such determiners can alternate in their grammatical relation, as in passives or extraction contexts. In addition, the rule also restricts the set of possible overlay-arcs that these supports can R-sponsor, viz. by excluding WH- and RR-overlay-arcs. So in sum, all four types of determiners are excluded in the following two structural contexts.

Comparing these structural contexts with the ones of the resuming element and free relative proforms, it is easy to see why these four types of determiners are excluded as resuming elements and free relative proforms. In order to be permitted as resuming elements, these types of determiners would have to head D-arcs that are supported by replacer arcs. Replacer arcs are always sponsored and therefore *never* head initial arcs. However, the rule for the four types of determiners requires the D-arcs they head to *always* be supported by some initial arc. As these requirements are mutually incompatible, these four types of determiners are excluded as resuming elements. The reason why they are excluded as free relative proforms as well follows from the analysis of free relative clauses as regular relative clauses with a special type of head noun. For under this analysis, the free relative proform heads a D-arc whose support R-sponsors an overlay-arc labeled 'RR'. However, these four determiners must not head D-arcs whose support R-sponsors an overlay-arc labeled

'RR'. Again, as these requirements are mutually incompatible, none of these four determiners can appear inside a constituent functioning as free relative proform.

I now turn to *wh-determiners*. The reason why they are excluded as resuming elements and free relative proforms is completely different from the ones encountered so far. For what excludes wh-determiners is a requirement put on the neighboring N-arc. More specifically, it can be shown that a D-arc headed by a wh-determiner requires that its neighboring N-arc is *always* headed by a lexical noun. Importantly, this noun can be *invisible*. In other words, even when a wh-determiner occurs naked as in (379), it is in fact accompanied by a lexical noun, but one that is deleted, or, to put in APG-terms, erased.

(379) **Welchen/was für einen** magst du   t?
       which   what for a   like   you
       Which/what one do you like?

Support for this claim comes again from ACs; for one can show that the generalization in (380) holds.

(380) *Naked wh-determiners are not sensitive to ACs.*

The validity of this generalization can be argued for on the basis of data involving wh-question extraction with naked wh-determiners from ACs, cf. (381).

(381) a. idioms
           Er hat einige Pfunde mit denen er t wuchern   kann.
           he has some pounds with which he practice.usury can
           Mit welchen/mit was für welchen kannst du   t wuchern?
           with which   with what for which   can   you   practice.usuary
           He has all reasons to show off. Can you show off as well?
       b. inner objects
           Ich möchte diesen Tod sterben. **Welchen/was für einen** möchtest du t sterben?
           I   want   this   death die   which   what for a   want   you die
           I want to die this kind of death. What about you?
       c. manner aderbials
           Peter läuft auf der linken Hand. **Auf welcher/auf was für einer** läufst du   t?
           Peter walks on his left   hand. On which   on what for a   walk   you?
           Peter walks on his left hand. Which one do you walk on?
       d. amount adverbials
           A: Der Wagen erreicht nicht mehr seine normale Geschwindigkeit.
              the vehicle reaches not   more his   normal speed
              The car doesn't reach its regular speed.
           B: Und **welche/was für eine** erreicht er noch t?
              and which what for a   reaches he still
              And which speed does it still reach?
       e. locational adverbials
           Wir müssen diese Straße abbiegen. **Welche/was für eine** müsst ihr t abbiegen?
           we must   this street turn.   which what for a   must you   turn
           We have turn at the street. At which street do you have to turn?

As the grammaticality of all these examples show, naked wh-determiners are not sensitive to ACs. Accepting the analysis of ACs as contexts that disallow constituents headed by O or UN, these data show that even naked wh-determiners are accompanied by lexical nouns, and not by O or UN. Importantly, in order for this argument to go through, one can show that the grammaticality of the sentences in (381) cannot be reduced to the effect that some lexical noun is close enough, so that some sort of pragmatic control is involved. For the same closeness is not sufficient in contexts where a pronoun appears, cf. (382).

(382) a. idioms

    A: Es gab einige Pfunde mit denen er t gewuchert hat.
        it gave some pounds with which he practiced.usury has
        He had good reasons to show off.

    *B: Ja, ich habe auch **mit ihnen** gewuchert.
        yes I have also with them practiced.usuary
        Yes, I had the same reasons.

  b. inner objects

    A: Ich möchte diesen Tod sterben.
        I want this death die
        I want to die this kind of death.

    *B: Also ich möchte **ihn** sicherlich nicht sterben.
        well I want him certainly not die
        Well, I don't want to die that way.

  c. manner aderbials

    A: Peter läuft auf der linken Hand.
        Peter walks on the left hand.
        Peter walks on his left hand.

    *B: Ich laufe auch **auf ihr**.
        I walk also on her
        I walk on it as well.

  d. amount adverbials

    A: Mein Wagen erreicht nicht mehr seine normale Geschwindigkeit.
        my vehicle reaches not more his normal speed
        My car doesn't reach its regular speed.

    *B: Mein Wagen erreicht **sie** schon.
        my vehicle reaches her already
        My car does.

  e. locational adverbials

    A: Wir müssen diese Straße abbiegen.
        we must this street turn.
        We have to turn at the street.

    *B: Wir müssen **sie** auch abbiegen.
        we must her also turn
        We must also turn at that street.

In order to capture the behavior of wh-determiners, I suggest the following rule, where 'set 3' is a variable over members of the set of wh-determiners.

(383) *German Wh-Determiner Rule*[87]
PH-Headed (A, Set 3) → D-Arc (A) ∧ ¬∃B (Neighbor (A,B) ∧ Pseudo-L-Headed (B, O ∨ UN))

This rule mentions a predicate undefined so far, viz. *Pseudo-L-Headed*; similarly to L-Headed, this predicate relates some arc to its branch labeled 'L', but not a basic-arc – as in the case of L-Headed – but a POS-arc. The formal definition is provided in (384).

(384) Def.: *Pseudo-L-Headed*
Pseudo-L-Headed (A, a) ↔ ∃B∃C (Branch (B,A) ∧ Stem-Arc (B) ∧ Branch (C,B) ∧ L-Arc (C) ∧ Logical Node (a, C))

Given this rule, wh-determiners are banned from the following context.

(385)
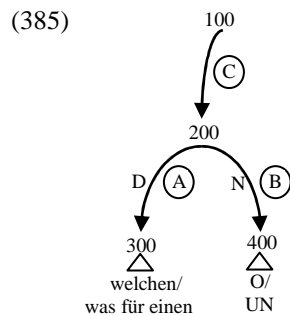
Given that wh-determiners are required to head D-arcs whose neighboring N-arcs are *never* headed by O or UN, their exclusion as resuming elements and free relative proforms is easy to explain because a resuming element and a free relative proform must head D-arcs whose neighboring N-arc is *always* headed by O or UN. Again, since both requirements are mutually incompatible, wh-determiners are excluded.

I now turn to the first set of elements that is permitted as resuming elements and free relative proforms, viz. to the set of elements that I classified as *wh-proforms*. It turns

---

[87] This rule oversimplifies because wh-determiners such as *welchen* differ from wh-determiners such as *was für ein* in an important respect: the former are permitted in non-interrogative uses, for example as an indefinite or as a relative proform, whereas the latter can only be used interrogatively.
(i) (speaking about milk)
    Ich möchte auch **welche**/***was für eine**!
    I want also which what for a
    I also want some!
(ii) Die eine Hand **auf welcher**/***auf was für einer** er t lief war sogar gebrochen!
    the one hand on which on what for a he walked was even broken
    The one hand on which he walked was even broken!
(ii) shows that wh-determiners such as *welchen* when used as a relative proform are still subject to the generalization in (392), that is, they are not sensitive to ACs. In any event, in order to capture the partially different behavior of the two types of wh-determiners, each would require a separate rule. However, as the relevant point for the exclusion of wh-determiners is their requirement to always be accompanied by a lexical noun, I ignore this complication.

out that given the distribution of the elements contained in this set, it actually be split into three disjoint subsets, viz the ones specified in (386).

(386) (i)   *wer* (Engl. who), *was* (Engl. what)
         (ii)   *wo* (Engl. where), *wann* (Engl. when), *wo*-adverbials
         (iii) reason *wh*-adverbs: *weshalb*/*warum*/*wozu*/*wieso* (Engl. why)

Of these three, only the members of the first two are available as resuming elements and free relative proforms, whereas the ones from the third set are not, as already documented in chapter 3, section 8.
Starting with the first subset, the reason why members of this subset are permitted as resuming elements and free relative proforms has to with the fact that the D-arcs headed by *wer* or *was* require their neighboring N-arcs to always be headed by O or UN. More specifically, it can be shown that the following generalization holds.

(387) *If* wer *and* was *head at least one initial arc then they are sensitive to ACs.*

That *wer* and *was* are sensitive to ACs has already been documented for free relative clauses. But these two wh-proforms can also be used as interrogatives and as indefinites, which two contexts involve initial arcs headed by them[88].

(388) a. **Wen**/**was** hast du t gesehen
              Who/what have you seen?
         b. Ich schreibe **wem was**/ **was an wen**.
              I   write   who what what on whom
              I write something to someone.

Importantly, the sensitivity to ACs extends to these uses.

(389) a. idioms
              * **Wer** hat ihn t geritten?   [der Teufel reitet X = X has the devil in him]
              who has him ridden
              Who does he have in him?
         b. inner objects
              * **Wen**/**was** möchtest du t sterben?
              who what want   you die
              What do you want to die?

---

[88] With one exception: *wer* is not fine as an indefinite when it bears the subject function.
(i) * **Wer** hat Maria gesehen.
      who has Maria seen
      Someone has seen Maria.
That subjecthood is responsible for the ungrammaticality of (i) is suggested by the observation that predicate nominals are fine with *wer* as an indefinite although predicate nominals are marked by nominative as well.
(ii) Wir sind wieder **wer**!
      we are   again who
      We are again someone!

    c. manner adverbials
       * **Auf wem/ auf was** läufst du t?
       on   whom on what walk you
       With what do you walk?
    d. amount adverbials
       * **Wen**/**was** erreicht dein Wagen t?
       who what reaches your vehicle
       What does you vehicle reach?
    e. locational adverbials
       * **Wen**/**was** müsst ihr t abbiegen?
       who what must you turn
       Where do you have to turn?

(390) a. idioms
       Er hat √**mit irgendwelchen Pfunden**/***mit   wem**/ ***mit was** gewuchert.
       he has   with some   pounds   with whom with what practiced.usury
       He showed off somehow.
    b. inner objects
       Ich möchte √**irgendeinen Tod**/***wen**/***was** sterben.
       I   want   some   death who what die
       I want to die some death/something.
    c. manner adverbials
       Ich laufe auf √**irgendeiner Hand**/***auf wem**/***auf was**.
       I   walk on some   hand   on whom on what
       I walk on some hand/something.
    d. amount adverbials
       Mein Wagen erreicht √**irgendeine Geschwindigkeit**/***wen**/***was**.
       my   vehicle reaches some   speed   who what
       My vehicle reaches some speed/something.
    e. locational adverbials
       Ihr müsst √**irgendeinen Weg**/***wen**/***was** abbiegen.
       you must   some   way   who what turn
       You have to turn some way/what.

Regarding the generalization about the structural context of these two wh-proforms,
the examples in (388b) show that the D-arcs headed by the two wh-proforms can
have supports that are either initial or sponsored arcs. This is so because as argued in
the previous section, the verb *schreiben* (Engl. to write) permits demotion of its
initial 3-object to 10-object, which means that *wen* in *an wen* in (389b) appears
internal to the constituent heading a sponsored 10-arc. Second, the examples in
(389) and (390) show that these two wh-proforms require the N-arc that is the
neighbor of the D-arc that they head to always be headed by O or UN. This latter
finding is supported by the observation that the availability of some controller noun
doesn't eliminate the sensitivity to ACs, as exemplified in (391).

(391) A: Also ich werde definitiv   diesen Weg abbiegen. Und du?
           well I   will   definitely this   way turn   and you
           Well, I will definitely turn that way. What about you?
      *B: Jaja,   ich werde auch **wen**/**was** abbiegen.
           yesyes, I   will   also   who what turn
           Yeah, I will also turn some way.

In order to capture both properties, I suggest the following rule, where 'set 4a' is a variable over members of the set of these two wh-proforms, including their case marked variants.

(392) *German Wh-Proform Rule 1*
       PH-Headed (A, Set 4a) → D-Arc (A) ∧ ∀B (Neighbor (A,B) → Pseudo-L-Headed (B, O ∨ UN)

According to this rule, wh-proforms of the first set can appear in the following context.

(393)
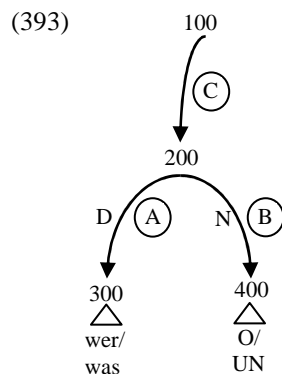
So in fact, all that this rule restricts is the neighboring N-arc to the D-arc headed by a member of this set of wh-proforms. As this is the only requirement, it becomes clear why these two wh-proforms are permitted as resuming elements and free relative proforms. For they satisfy the requirement that the D-arcs headed by a resuming element or a free relative proforms must neighbor an N-arc headed by O or UN. Consequently, they are permitted. Importantly, although the support of the D-arc headed by the resuming element is always sponsored, whereas the support of the D-arc headed by the free relative is not, this difference is of no relevance because the rule for these two wh-proforms doesn't put any restrictions on the support of the D-arc at all. An important side effect of this rule is that it captures that neither *wer* nor *was* are available in regular relative clauses, as demonstrated in (394).

(394) a.* Der Mann **wer** t Maria liebt   kam   zu Besuch.
            the man   who Maria loves came to visit
            The man who loves Maria came for a visit.

b.* Das Regal   **was** ich t gekauft habe war aus Vollholz.
    the bookshelf what I   bought have was out solid-wood
    The bookshelf I bought was made of solid wood.

The reason that *wer* and *was* are excluded in regular relative clauses is that regular relative clauses involve a D-arc whose neighboring N-arc is headed by a lexical noun; but as the rule in (392) specifies, *wer* and *was* must not head D-arcs whose neighboring N-arcs are headed by a lexical noun.

The rule for the second set of wh-proforms is nearly identical to the one for the first set, as the distribution of the two sets partially overlaps. For example, the members of the second set are available as interrogatives and indefinites, as well, with the exception of *wann* (Engl. when) though.

(395) a. **Wann** ist Peter t angekommen?
        when is Peter arrived
        When has Peter arrived.
    b.* Peter ist **wann** angekommen.
        Peter is when arrived
        Peter has arrived at some point.
    c. **Wo**   haben wir uns schon   mal   gesehen?
        where have   we us   already time   seen
        Where did we already meet?
    d. Wir haben uns schon   mal **wo**   gesehen.
        we have   us   already time where seen
        We already met somewhere.
    e. **Womit**   beschäftigt Peter sich gerade.
        what.with occupies   Peter SELF even
        What is Peter busy with right now?
    f. Peter beschäftigt sich gerade **womit**.
        Peter occupies   SELF even   what.with
        Peter is busy with something.

Concerning their sensitivity to ACs, *wann* and *wo* are not sensitive to ACs, whereas all *wo*-adverbials are, as shown by (396) and (397), respectively.

(396) locational adverbials
    a. **Wo**   musst du t abbiegen?
        where must you turn
        Where do you have to turn?
    b. Ich muss erst noch **wo**   abbiegen dann sind wir da.
        I   must first still where turn   then are   we there
        I first have to turn somewhere, then we have reached our destination.

(397) (i) manner adverbials
    a.* **Womit**   sprichst du t?
        what.with speak   you
        How do you talk?

b.* Ich spreche **womit**.
   I   speak   what.with
   I speak somehow.

c.* **Worauf** läufst du t?
   what.on walk you
   How do you walk?
d.* Ich laufe **worauf**.
   I   walk what.on
   I walk somehow.
(ii) locational adverbials
a.* **Worin** hast du t studiert?
   what.in have you studied
   Where did you study?
b.* Ich studiere **worin**.
   I   study   what.in
   I study somewhere.

This split is nevertheless expected if *wann* and *wo* are analyzed as particles heading D-arcs, and proforms containing D-arcs headed by particles are generally outside the scope of ACs, which are defined for nominal proforms only; cf. the characterization for ACs from (342), repeated here as (398).

(398) *AC Characterization*
     An AC does not accept any arc A such that (i) one of A's R-branches labeled POS is headed by members of Inexplicit and (ii) the D-arc branch of A has an N-arc branch.

The sensitivity of *wo*-adverbials to ACs is also not unexpected because the *wo-* part is generally assumed to be a variety of *was*, having undergone some kind of fusion with the preposition (cf. Müller 2000), and *was* is sensitive to ACs as well.
However, this set of wh-proforms differs from the first set of wh-proforms in one important respect: its members are permitted as relative proforms even in regular relative clauses.

(399) a. Der Tag **wann** ich t Geburtstag habe ist der erste März.
        the day when I   birthday   have is the first march
        My birthday is the first of March.
    b. Die Stadt **wo**   ich t wohne heißt   Berlin.
        the city   where I   live   is.called Berlin
        The city where I live is Berlin.
    c. Das Ereignis **womit**   sich alle t beschäftigen ist der Papstrücktritt.
        the event   what.with SELF all   occupy   is the pope.resignation
        The event that keeps everyone busy is the resignation of the pope.

The split regarding the sensitivity to ACs carries over to regular relative clauses: *wo* is not sensitive to ACs in regular relative clauses (cf. (400)), whereas *wo*-adverbials are (cf. (401))[89].

(400) locational adverbial
Die Stadt **wo** ich t wohne heißt Berlin.
the city where I live is.called Berlin
The city where I live is Berlin.

(401)[90](i) idioms
a.* Man muss ja erstmal Pfunde haben **womit** man t wuchern kann.
one must yes first.of.all pounds have what.with one practice.usury can
One needs something in the first place that one can show off.
(ii) manner adverbials
a.* Es ist anstrengend der leisen Stimme **womit** er t spricht zu folgen.
it is exhausting the quiet voice what.with he speaks to follow
It's exhausting to follow the quiet voice with which he speaks.
b.* Die eine Hand **worauf** er t lief war sogar gebrochen!
the one hand what.on he walked was even broken
The one hand on which he walked was even broken!
(ii) locational adverbials
c.* Die Stadt **worin** ich t wohne heißt Berlin.
the city what.in I live is.called Berlin
The city where I live is called Berlin.

In order to capture the behavior of this set of wh-proforms, I suggest that it differs from the first set in that the second set requires *at least one* N-arc headed by O or UN as a neighbor of the D-arc headed by some member of that set. This contrast with the first set, which requires *all* N-arcs that are a neighbor of the D-arc headed by the some member of that set to be headed by O or UN. The rule is given a more fomalized version in (402), where 'set 4b' is a variable over the second set of wh-proforms.

(402) *German Wh-Proform Rule 2*
PH-Headed (A, Set 4b) $\rightarrow$ D-Arc (A) $\land$ $\exists$B (Neighbor (A,B) $\rightarrow$ Pseudo-L-Headed (B, O $\lor$ UN)

This rule is compatible with two types of structures, viz. the ones in (403) and (404), but not with a third one, viz. the one shown in (405); in these examples and the ones to follow, 'LN' abbreviates 'lexical noun'.

---

[89] As I haven't came across antipronominal contexts with temporal adverbials, *wann* is impossible to illustrate.
[90] Compare these bad cases with the good cases not involving *wo*-adverbials; cf. (371ib), (371iii), and (371vib).

(403)　　　100　　　(404)　　　100　　　　(405)　　　100
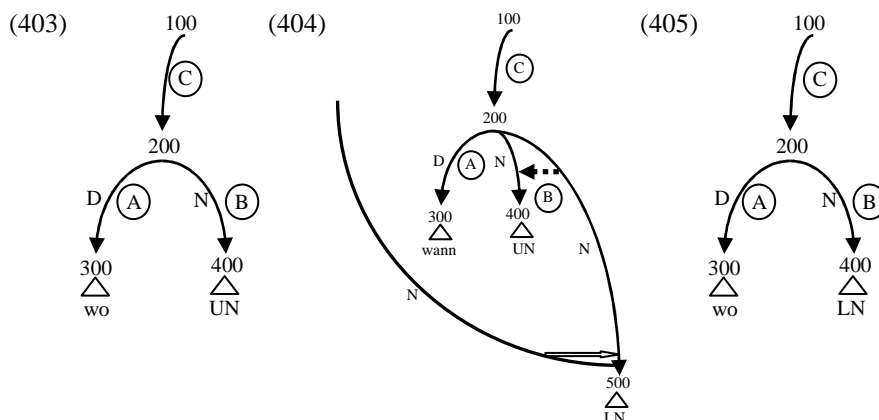
The structure in (403) is identical to the one in (393), capturing why the wh-proforms of the second set are permitted as both resuming elements and free relative proforms. The second structure in (404) is at work in regular relative clauses: there is a lexical noun that is erased[91] and given the definition Replace-I, a Pro arc occurs. As Pro arcs must terminate in O or UN, this arc is headed by one of these two elements. Therefore, arc B satisfies the restriction of the rule in (402) that there is at least one N-arc headed by O or UN. The structure in (405), however, is excluded because there is no N-arc that is headed by O or UN, thereby capturing the ungrammaticality of sentences such as (406) where *wo* and *wann* are accompanied by an overtly realized noun.

(406)　a.* Ich wohne **wo** 　　Stadt.
　　　　　 I 　 live 　where city
　　　　　 I live in the city.
　　　 b.* I komme **wann** Zeit.
　　　　　 I come 　when time.
　　　　　 I come at that time.

I finally want to speculate how to describe the third set of wh-proforms, that is, the one containing reason wh-proforms. The reason why these wh-proforms are treated separately is because they show a very particular behavior: they are not permitted as indefinites, they are not possible as either resuming elements or free relative proforms, but they are permitted as relative proforms in regular relatives.

(407)* Ich rufe sie **weshalb/warum/wozu/wieso** an.
　　　　 I 　 call 　her why 　　　　　　　　　　 on
　　　　 I call her for some reason.

---

[91] Guaranteeing that two N-arcs can be present requires modifying the POS Exclusiveness Law from section 4 as shown in (i); this modification also captures that if two N-arcs are present, then one is erased.
(i) 　*The POS Exclusiveness Law (Modified Version)*
　　　 POS-Arc (A) ∧ POS-Arc (B) ∧ Colimb (A,B) → Replace (A,B)

(408) a. $^?$**Weshalb** glaubst du weshalb sie t weint?
     b.$^{??}$**Warum** glaubst du warum sie t weint?
     c.* **Wozu** glaubst du wozu   sie t weint?
     d.* **Wieso** glaubst du wieso sie t weint?
      why   believe you why   she cries
      Why do you think she cries?

(409) a. $^?$Ich komme weshalb man mich t gerufen hat.
     b.$^{??}$Ich komme warum man mich t gerufen hat.
     c.* Ich komme wozu   man mich t gerufen hat.
     d.* Ich komme wieso man mich t gerufen hat.
      I   come   why   one me   called has
      I come for the reason for which I was called.

(410) Der Grund **weshalb**/**warum**/**wozu**/**wieso** sie mich t anruft ist offensichtlich.
      The reason why she calls me is obvious.

The suggestion I want to offer for these cases is that these wh-proforms head D-arcs (i) whose support necessarily R-sponsors an overlay-arc labeled either 'WH' or 'RR', and (ii) whose neighboring N-arc is necessarily headed by an erased lexical noun. The first condition captures that they are restricted extracted positions only (cf. (407)), the second one that they are restricted to regular relative clauses only, and not to free relative clauses. The rule for this third set of wh-proforms is given in (411), where 'set 4c' is a variable over members of this third set of wh-proforms.

(411) *German Wh-Proform Rule 3*
     PH-Headed (A, Set 4c) → D-Arc (A) ∧ ∃B (Neighbor (A,B) ∧ ¬Pseudo-L-Headed (B, O ∨ UN) ∧ ∃E (Erase (E,B)) ∧ ∃C∃D (Support (C,A) ∧ Overlay-Arc (D) ∧ R-Sponsor (C,D) ∧ (WH-Arc (D) ∨ RR-Arc (D))

The structural context required by this rule is shown in (412).

(412)
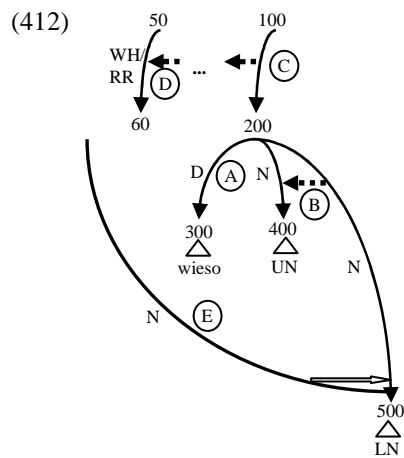
Regardless of whether the formulation of the rule in (411) is correct, it captures why wh-proforms of that set are permitted as neither resuming elements nor free relative proforms. For these require D-arcs headed by elements that can appear as neighbors to N-arcs headed by O or UN; however, the members form the third set of wh-proforms can only head D-arcs that are neighbors of N-arcs not headed by O or UN. Finally, I turn to *definite determiners*. The reason why these are available as resuming elements and free relative proforms has to with one of their peculiarities, viz. that they put no restriction on the N-arc that is a neighbor of the D-arc definite determiners head. In other words, the N-arc can either be headed by a lexical noun or by either O or UN. The first option is instantiated in all cases where definite determiners function as determiners.

(413) **der** Mann/**die** Frau/**das** Kind/**die** Leute
       the man/the woman/the child/die people

The second option amounts to the claim that definite determiners can be used anaphorically, similar to personal pronouns. This view seems problematic because normally definite determiners cannot be used anaphorically (Wiltschko 1998).

(414)* Peter$_i$ hat geglaubt dass **der**$_i$ dumm ist.
       Peter has believed that he   stupid is
       Peter believes that he is stupid.

Although true that this example is ungrammatical, as was pointed out by Bosch et al. 2003, Geyer 2007, and Hinterwimmer (to appear), definite determiners *can* be used anaphorically.

(415) Paul wollte mit Peter$_i$ laufen gehen, doch **der**$_i$ war leider   erkältet.
       Paul wanted with Peter run   go   but he   was unfortunetly had.a.cold
       Paul wanted to go running with Peter, but he had a cold.

The reason why the definite determiner is fine in (415) but not in (414) has to do with pragmatic factors. More specifically, as pointed out in the works cited above, definite determiner can only be used anaphorically if the antecedent is not the aboutness topic (Hinterwimmer, to appear, p. 31). This condition is violated in (414) because 'Peter' is the aboutness topic; in (415), on the other hand, 'Peter' is not the aboutness topic, but 'Paul', so 'Peter' is available as antecedent. When used anaphorically, (most[92]) definite determiners are sensitive to antipronominal contexts.

---

[92] I deliberately say 'most' because in some antipronominal contexts, definite determiners sound acceptable to my ear, cf. (i) and (ii).
(i) amount adverbials
     A: Ich bin **2,50m** groß.
         I   am 2,50m big
         I stand 2,50 metres tall.
     B: ?**Die** bist du   niemals groß!
         them are you never   big
         You certainly don't stand them tall!

(416) (i) inner objects
    A: Ich möchte **so einen Tod** nicht sterben.
       I   want   so a   death not die
      I don't want to die such a death.
    *B: Ich möchte **den** schon   sterben.
       I   want   that already die
      I however want to die such a death.

  (ii) manner adverbials
    * Peter hat mit großem Vergnügen Klavier gespielt, und dann **mit dem** auch Cello
      Peter has with big   joy   piano   played   and then with that also cello
      Peter played piano with great pleasure, and then he played also cello with it.

  (iii) durational adverbial
    a.* Maria hatte vor   dem Konzert noch 3 Stunden um   zu
       Maria had before the concert still 3 hours   in.order to
       üben,   und sie hat **die** tatsächlich alles nochmal geübt.
       practice and she has them indeed   all   again   practiced
      Maria had another three hours to practive before the concert started
      and she really has practiced everything in them again.

    b. A: Ich saß das Jahr als   Kennedy starb im Gefängnis.
       I   sat the year when Kennedy died in prison
      The year Kennedy died I was in prison.
     *B: Echt, ich saß **das** auch im Gefängnis.
      really I   sat that also in prison
      Really, I sat that in prison, too.

So in sum, definite determiners can be used anaphorically, that is, the N-arc neighboring the D-arc headed by a definite determiner can be headed by O or UN, even if only under certain pragmatic conditions. I will not attempt to express this condition in the rule for definite determiners though, simply because I have no idea at this point how to incorporate pragmatic factors into a grammar quite generally. Nevertheless, the use of definite determiners as resuming elements and free relative proforms is compatible with this condition, no matter how eventually formulated. Despite this general freedom of definite determiners, they are subject to one constraint that regulates what the D-arc's support can R-sponsor. More specifically, if this support R-sponsors an overlay-arc, then this overlay-arc must not be a WH-arc. This condition accounts for the observation that constituents containing definite determiners heading the constituent's D-arc can undergo topicalization, left dislocation, right dislocation, but not wh-question extraction.

(ii) locational adverbials
  ?? Peter sagt, er muss die nächste Station aussteigen, dabei muss er **die** doch nur umsteigen.
    Peter says he must the next   station leave   thereby must he them PRT only change.trains
    Peter says that he has to leave at the next station, but in fact he only has to change trains there.
I have at this point no idea why definite determiners are not sensitive to antipronominal contexts across the board. Possibly, the acceptable examples involve some sort of noun-ellipsis.

(417) a. topicalization
       Den Mann kenne ich t.
       the man   know I
       I know the man.
   b. left dislocation
       Den Mann, den kenne ich t.
       the man   who know I
       I know the man.
   c. right dislocation
       Ich kenne ihn, **den** Mann.
       I   know him, the man
       I know him, the man.
   d. wh-question extraction
     ***Den** Mann kennst du t?
       the man   know you
       Which x is such that x is a man and you know x?

The rule for definite determiners is given in (418), where 'set 5' is a variable over members of the set of definite determiners.

(418) *German Definite Determiner Rule*
      PH-Headed (A, Set 5) → D-Arc (A) ∧ ∀C¬∃D (Support (C,A) ∧ R-Sponsor (C,D) ∧ WH-Arc (D))

So, definite determiners are compatible with the contexts shown in (443) and (444), but not in with the one illustrated in (445).
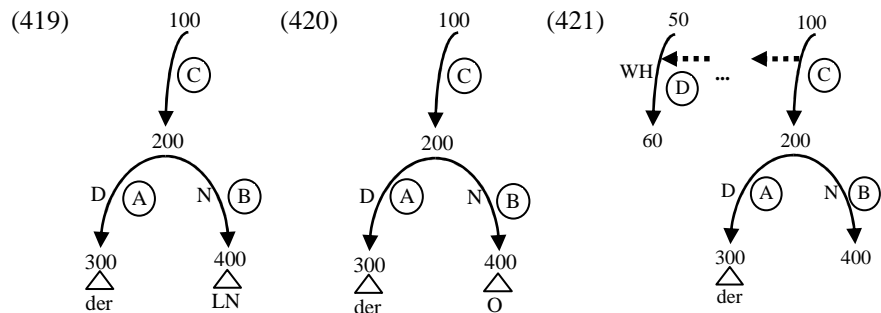
The structure in (419) is present in the examples (413) and regular relative clauses, the only difference being that in the latter case the N-arc is erased. The structure in (420) is instantiated in (415) and (416), and the ungrammaticality of the structure in (421) excludes examples similar to the one in (417d).
Given the rule in (418), the availability of definite determiners as resuming elements follows from the fact that definite determiners heading D-arcs are compatible with neighboring N-arcs headed by O or UN, as required by the D-arc of the resuming element. In addition, the pragmatic condition on admissible antecedents is satisfied

by definite determiners function as resuming elements because the antecedent would correspond to the 30-arc, and this arc does certainly not specify an aboutness topic. That they are also permitted as free relative proforms follows from the same reason: they are compatible with the requirement that the N-arc neighboring the D-arc of the free relative proform has to be headed by O or UN. The pragmatic condition is again not violated because free relative proforms lack an antecedent altogether, so that the condition is vacuously satisfied.

6.8.4 Summary

In this section, I have argued that it is not an arbitrary feature of wh-copying that the resuming element is spelled out by the same set of elements that appear in free relative clauses, viz. by the set comprising some wh-proforms and definite determiners. For as I have argued, the elements contained in this set are the only ones that can appear in the structural context required by the resuming element and the relative proform in free relative clauses. This was shown on the basis of their distribution in contexts independent of free relative clauses and wh-copying. In addition to this, I have shown that all other sets of proforms and determiners do not match either the structural context in which the relative proform in free relative clauses appears, or the structural context in which the resuming element, which again was shown on the distribution of these element in contexts other than wh-copying and free relative clauses.

6.9   General Summary

I have argued in this chapter that by adopting the APG framework the properties of the resuming element uncovered in chapter 3 can be captured by APG without treating them as accidental properties. More specifically, all that is required to explain these properties is a *single* rule, viz. the one given in (422).

(422)   *Wh-Copying Rule German*
        Mediator (A) ∧ Rel-Marker (B,A) → ∃C (Replace (C,B))

The relevant properties of the resuming element are repeated in (423)-(428).

(423)   POSITION OF THE RESUMING ELEMENT
        The resuming element occupies a clause left peripheral position.

(424)   CHARACTERIZATION OF THE RESUMING ELEMENT
        The resuming element is a free relative proform.

(425) AGREEMENT RESTRICTION FOR NOMINAL RESUMING ELEMENTS
       *If the resuming element is a free relative pronoun, then the extracted element
       is a nominal with which the resuming element agrees in φ-features and case.*

(426) AGREEMENT RESTRICTION FOR PPS AS RESUMING ELEMENTS
       *If the resuming element is a free relative pro-PP, then (i) the extracted
       element is a PP such that the preposition is identical to the one in the pro-
       PP, and (ii) the nominal complements of both PPs agree in φ-features and
       case.*

(427) AGREEMENT RESTRICTION FOR ADVERBS AS RESUMING ELEMENTS
       *If the resuming element is a free relative adverb, then it and the extracted
       element are relationally equivalent.*

The rule in (422) only specifies that some element must be present into a clause left
peripheral position, but it crucially doesn't specify that this element corresponds to a
proform, let alone to a free relative proform, nor does it contain any statements on
the agreement properties of this element. Nevertheless, all these properties are
covered as well by this rule.

Consider first the status of this element as a proform. I have shown in section 5 that
extraction instantiates the context for Replace. I have also shown that Replace
comes in two versions, only one of which is relevant for the analysis of proforms.
Importantly, although the rule doesn't say which type of Replace has to be satisfied,
independent laws allow only the version of Replace that permits proforms in the
context specified by the antecedent clause of the rule in (422). Therefore the status
of the resuming element as a proform is captured without specifying that this
element has to be a proform because *nothing else but a proform could be present in
the first place*.

That the set of proforms used as resuming elements is identical to the set used as
free relative proforms was shown in section 7 to follow from the fact that *only the
members of this set are compatible with the structural context of both the resuming
element and a free relative proform*. In particular, I have shown that each proform
specifies the structural context in which it can appear. It was then shown that out of
the many proforms German possesses, only the ones that are also used as free
relative proforms match the structural context in which the proform permitted by the
rule in (422) appears.

Turning to the agreement restriction for nominal resuming elements, I showed that
agreement for case is a consequence of the fact that the replacer has to bear the
grammatical relation as the relational marker, which itself bears the same
grammatical relation borne by the extracted element prior to extraction. As argued
for in section 6, grammatical relations determine case on nominals so that *the
extracted element and the resuming element have to agree for case because they
both bear the same grammatical relation*. Agreement for φ-features however
follows from a general requirement that a proform has to agree with its antecedent in
precisely these features, cf. section 7. Since the connection between the resuming
element and the extracted element is a special case of the connection between a
proform and its antecedence, they are subject to this requirement as well.

With respect to the agreement restrictions on PPs as resuming elements, I argued in section 6 that the retention of the preposition is in fact due to the same requirement that case has to be retained on nominals because *adpositions and case affixes are treated identically in APG*, the difference between only being a morphological one (free vs. bound morpheme). The agreement for agreement features between the extracted element and the resuming element follows from the same requirement at work for nominal resuming elements, viz. that *a proform has to agree in these features with its antecedent*.

Finally, as also shown in section 6, the agreement restriction for adverbs is also covered by the relational equivalence between the extracted element and the resuming element. More specifically, adverbs are inherently marked for a grammatical relation. Consequently, nothing bars structures where an adverbial proform expresses the grammatical relation that is expressed as a PP by the extracted element because *both the PP and the advberb are relationally equivalent*. That an adverb does not agree with a PP as an extracted element for φ-features follows from the condition on φ-feature agreement which is required to obtain only between elements that are marked for φ-features in the first place. Since adverbs are never marked for φ-features, they cannot agree in φ-features, and therefore must not agree in φ-features.

In sum, apart from a single rule that specifies the position of the resuming g element, all other properties follow from independent principles and no recourse to arbitrary mechanisms is needed relating the extracted element to the resuming element.

Chapter 7

Pay-offs of the APG Analysis of Wh-Copying

7.1   Introduction

Based on the theoretical tools provided by the APG framework introduced in chapter 5, I presented in chapter 6 an analysis of wh-copying in general and of the resuming element in particular. Contrary to all previous analyses of wh-copying, this analysis has the benefit of being able to treat the resuming element in a non *ad hoc* manner because its properties need not be treated as accidental properties. For example, that the resuming element is a proform follows as a side effect of the arc-based treatment of extraction and the conditions regulating the presence of proforms. In addition, the arc-based treatment of case affixes and adpositions also allows a unified account of the agreement properties of the resuming element, specifically for the distribution of case affixes and prepositions. Nevertheless, the benefit of my APG analysis for wh-copying hinges crucially on a number of theoretical assumptions that themselves seem rather *ad hoc*, like relational markers and 30-arcs, or dubious, for example the arc-based treatment of proforms, case affixes and adpositions. It is therefore fair to ask whether the success of this analysis is real or only apparent, because it looks like *ad hoc* assumptions about the analysis of the resuming element have been replaced by *ad hoc* assumptions about sentence structure. If this were the case, nothing would be gained by adopting this analysis. While not relying directly on *ad hoc* assumptions about the properties of the resuming element, it would indirectly rely on *ad hoc* assumptions about sentence structure in general.

The purpose of this chapter is to show that such skepticism towards my APG analysis developed in the previous chapter is unwarranted. I argue that the seemingly artificial or problematic assumptions of my APG analysis are in fact well supported and allow a straightforward treatment of a number of syntactic phenomena completely unrelated to wh-copying.

The remainder of this chapter is organized as follows. Section 2 deals with the arc-based treatment of proforms. I first provide supporting evidence for this treatment from data involving an overt manifestation of the structure that underlies proforms in general, viz. one involving antecedent repetition. The second piece of evidence I

offer for the APG treatment of proforms comes from constructions with 'false' proforms, that is, proforms that don't serve the function of marking coreference relations. I then examine three problems this arc-based treatment allegedly faces, viz. the deictic use of proforms, proforms anteceded by quantified expressions, and proxy readings of proforms; I conclude that none of these problems cause any harm. In section 3, I turn to the arc-based treatment of extraction and show how this treatment captures successive cyclicity effects, island-sensitive *in situ* concstructions, selective successive cyclicity effects, wh-agreement effects, and complementizer alternations in extraction contexts. Moreover, I also suggest an extension of this treatment that allows one to capture partial movement and *wh in situ* constructions that are not sensitive to islands. In section 4, I investigate the benefits of the arc-based treatment of case affixes and adpositions. I first provide factual support for the main assumption underlying this analysis, viz. that case affixes and adpositions are distributionally equivalent and form one natural class, referred to as flags. I then turn to an important benefit of the Closure Law, viz. that it excludes on principled grounds two unattested types of multiple case marking. Finally, I mention some open questions and problems the flagging analysis faces.

I will not present in this chapter, though, any support for, first, the analysis I developed for agreement in φ-features between the extracted element and resuming element and, second, the analysis of the status of the resuming element as a free relative proform. The reason for this is that both analyses capture the relevant properties with theoretical assumptions that are not specific to APG and that will therefore be subject to less scepticisms than the ones adhered to in the other analyses. Analyzing agreement for φ-features between a proform and its antecedent via a requirement demanding an identical substructure for both is the standard approach in all frameworks known to me, and nothing hinges on expressing this via overlapping arcs. Similarly, the analysis for the status of the resuming element as a free relative proform builds on the standard idea that proforms in general are restricted to certain structural contexts, and is silent on whether to give an arc-based specification of these contexts or not. These two analyses therefore contrast with the other analyses because the success of the latter does depend on an arc-based treatment of the relevant phenomena.

7.2   Benefits of the APG Treatment of Proforms

7.2.1   Introduction

The purpose of this section is to point to data that receive a straightforward analysis under the arc-based, APG treatment of proforms. The first set of data comes from languages where coreference relations are not expressed with the help of a proform connected to some antecedent but where the antecedent is repeated in the position where a proform is expected. Although such a pattern of marking coreference is superficially different from one using proforms as a device for marking coreference, this pattern is expected under the arc-based treatment of proforms. For such a pattern

simply corresponds to the source structure that underlies all anaphoric devices, viz. one containing two instances of the same constituent, that is, a constituent heading two arcs. The second set of data comes from languages where proforms appear in contexts where they don't mark coreference relations; I dub such proforms *false proforms* in the remainder of this section. False proforms split up into resumptive pronouns and false reflexives. Resumptive pronouns are pronouns whose antecedent is an extracted constituent, whereas false reflexives are reflexive pronouns that mark promotion of an element to subject relation. False proforms pose no problems for the APG analysis of proforms because, under this analysis, proforms can be connected to all types of antecedents, irrespective of whether this antecedent appears in a position where it bears referential force (that is, in an argument position). Nothing therefore bars contexts where the antecedent is an extracted element (as in the case of resumptive pronouns) or a derived subject (as in the case of false reflexives). This is so because the antecedent of a proform is nothing but an element heading an arc that erases another overlapping arc irrespective of the R-signs borne by the respective arcs. In other words, the APG treatment of proforms captures that the use of proforms as markers of coreference is only one usage among many others[1].

The remainder of this section is organized as follows. In the next section, section 2.2, I investigate a language where coreference is expressed via the repetition of a constituent. In section 2.3, I deal with resumptive pronouns, and with false reflexives in section 2.4.

7.2.2   Antecedent Repetition

The first piece of evidence supporting the APG analysis of proforms comes from languages where coreference is marked by the repetition of the relevant nominal constituent. There are three such languages, viz. Thai, Hmong, and San Lucas Quiaviní Zapotec (henceforth, *SLQZ*), illustrated in (1)-(3), respectively.

(1)   a. Noi$_1$ kit [$_S$ waa Noi$_1$ ja   chana].
           Noi think that Noi FUT win
           Noi thinks that she will win.
       b. Sid$_1$ choop maa [$_S$ tee   Noi ser hai Sid$_1$].
           Sid like   dog   that Noi buy give Sid
           Sid likes the dog that Noi bought him.
       c. [Puuying suai   tii   suu nangsuu]$_1$ choop meeo tii   Sak hai kub
            woman   pretty that buy book   like   cat   that Sak give to
           [puuying suai   tii   suu nangsuu]$_1$
            woman   pretty that buy book
           The pretty woman that bought the book likes the cat that Sak gave to her.
                                        (Larson 2006, ex. 5, ex. 21, & ex. 27)

---

[1] I should stress here that already Johnson & Postal 1980 mention this benefit, cf. p. 451, and sections 6 and 8 of their chapter 11.

(2)   a. Pov$_1$ yeej   qhuas Pov$_1$.
            Pao   always praise Pao
            Pao always praises himself.
        b. Pov$_1$ has [$_S$ tas   Maiv nyam Pov$_1$].
            Pao   say   that May like   Pao
            Pao said that May likes him.
        c. [$_S$ Thaus Pov$_1$ ua teb] Pov$_1$ has   lugtxaj.
               when Pao   do field Pao   speak poetry
            While Pao did farm work, he sang poetry.
                                  (Mortensen 2004, ex. 2, ex. 25, & ex. 27)

(3)   a. Ryu'làáa'z Gye'eihlly$_1$ Gye'eihlly$_1$.
            like   Mike   Mike
            Mike likes himself.
        b. Ralloh Gye'eihlly$_1$ [$_S$ ryu'làáa'z lia   Pam Gye'eihlly$_1$].
            think   Mike   like   FEM Pam Mike
            Mike thinks that Pam likes him.
        c. [$_S$ Zi'cygàa' nih cayuhny Gye'eihlly$_1$ zèèiny] bìillyga' Gye'eihlly$_1$.
               while   that do   Mike   work   sang   Mike
            While Mike was working, he sang.
                                        (Lee 2003, ex. 1, ex. 48, & ex. 53)

All these examples feature the repetition of an element in a position in which in a
language like English a proform would appear. In Hmong and SLQZ, this repetition
is found even in control structures[2], as the examples in (4) and (5) respectively
show.

(4)   Pov xav   [$_S$ kom Pov noj mov].
        Pao want   that Pao eat rice.
        Pao wants to eat rice.
                                            (Boeckx et al. 2009, fn. 12)

(5)   Rcàáa'z Gye'eihlly [$_S$ gauh Gye'eihlly bxaady].
        want   Mike   eat   Mike   grasshopper
        Mike wants to eat grasshoppers.
                                            (Lee 2003, ex. 83)

That these structures involve repetition is suggested by the interpretation of these
structures: the two identical nominals are interpreted as coreferent in all these
examples, which is impossible in languages like English (*Mike likes Mike*
necessarily involves two distinct Mikes, at least without special intonation). These

---

[2] Postal 1970 provides evidence that control structures in English feature invisible proforms at the subject
position of a clause embedded under a control predicate. If correct, this supports the idea of a single
difference distinguishing between English one the one hand and Thati, Hmong, and SLQZ on the other
hand, viz. that wherever the latter languages employ the repetition of the antecedent, English uses a
proform.

data are not amenable to a view that some version of Principle C is simply absent in Thai, Hmong, and SLQZ, as the examples in (6)-(8) respectively show.

(6)   a.* Khaw$_1$ choop John$_1$.
             he   like   John
             He likes John.
       b.* Aajarn$_1$ khit [$_S$ waa raw choop John$_1$].
             teacher think that we like   John
             The teacher thinks we like John.

                                                               (Lee 2003, ex. 39 & ex. 41)

(7)   a.* Nwg$_1$ yeej   qhuas Pov$_1$.
             he   always praise Pao
             He always praises Pao.

                                                               (Mortensen 2004, ex. 5a)

       b.* Pov$_1$ yeej   qhuas tug xibfwb$_1$.
             Pov always praise the teacher
             Pao always praises the teacher.

                                                               (Boeckx et al. 2009, ex. 8b)

(8)   a.* Bgwi'ih-ëng$_1$ lohoh Gye'eihlly$_1$.
             looked-he   at   Mike
             He looked at Mike.
       b.* Ryu'lààa'z Gye'eihlly$_1$ me's$_1$.
             like   Mike   teacher
             Mike likes the teacher.

                                                               (Lee 2003, ex. 6 & ex. 8)

As these examples indicate, it is not the case that a nominal constituent can simply be coreferent in the same structural configurations with some other nominal constituent (be it a proform as in the a-examples or a nominal constituent as in the b-examples). Only coreference with an identical element is well-formed.

Given the APG treatment of proforms, these data receive a straightforward analysis. For they are nothing but an overt instantiation of the structure *underlying* proforms in general, viz. one involving overlapping arcs. But in contrast to languages such as English or German, Thai, Hmong, and SLQZ allow such overlapping arcs to *surface*. In other words, although English and German on the one hand look very different from Thai, Hmong, and SLQZ on the other hand, they are completely identical on an abstract level, which involves overlapping arcs. The only difference is that erasure of one of the two arcs is not required in Thai, Hmong, and SLQZ, contrary to English and German. The structure for (1a) is given in its simplified form in (9).

(9)
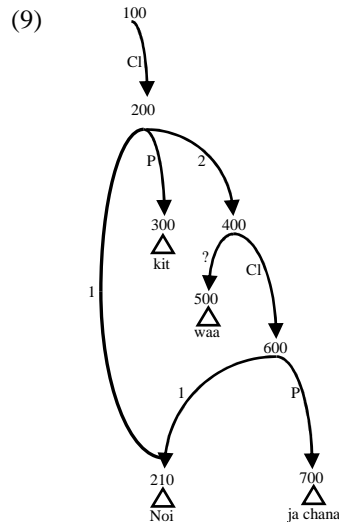
This account is not harmed by the observation that the languages under discussion put constraints on admissible structures with surfacing overlapping arcs. For example, whereas Hmong and SLQZ allow the expression of clause-internal coreference via repetition of a nominal, Thai does not[3].

(10)   a.* Sak$_1$ dti Sak$_1$.
            Sak   hit Sak
            Sak hit himself.
        b.* Nid$_1$ hai   dookmaai (kub) Nid$_1$.
            Nid gave flowers   to   Nid
            Nid gave flowers to himself.

(Larson 2006, ex. 4 & ex. 16)

In APG terms, Thai is subject to a rule prohibiting overlapping *neighboring* arcs, contrary to Hmong and SLQZ. In addition to this, these languages also put constraints on the kind of nominals that can be repeated. For example, neither Thai nor SLQZ allow quantificational elements (cf. 11a and 11b), contrary to Hmong (cf. 11c)[4].

---

[3] Cf. Lasnik 1989b for different judgments.
Incidentally, that Hmong and SLQZ allow clause-internal repetition of an antecedent seems problematic at first sight because it would involve two neighboring overlapping surface. And as shown in section 6 of chapter 5, such structures are unlinearizable. However, this problem is only apparent because as mentioned in fn. 3 of chapter 5, I suppress the structural representation of VPs quite generally in my structures. As soon as VPs would be included, the problem vanishes For then the subject internal to the clause defining the VP will have a 1-arc F-successor outside the clause defining the VP so that the VP-internal 1-arc no longer counts as a surface arc.
[4] In addition to this constraint, SLQZ does not allow repetition of a nominal constituent that is a coordinate structure (cf. Lee 2003, ex. 22), and both Thai (Larson 2006, p. 434) and Hmong (Mortensen 2004, p. 7) don't allow a nominal constituent containing a classifier to be repeated.

(11)   a.* [Thuk khon]$_1$ konnuad [thuk khon]$_1$.
        Everyone   shaved   everyone
        Everyone shaved himself.

                                            (Lee 2003, ex. 44)

       b.* Bguhty [yra'ta' ra bxuuhahz]$_1$ [yra'ta' ra bxuuhahz]$_1$.
           killed   every PL priest   every   PL priest
           Every priest killed himself.

                                  (adapted from Lee 2003)

       c. Suavdlawg$_1$ yeej   qhuas suavdlawg$_1$.
          everyone   always praises everyone
          Everyone (as a group) praises themselves (as a group).

                                (Mortensen 2004, ex. 9a)

In APG terms, both Thai and SLQZ are subject to a rule that excludes quantificational elements heading two arcs in the S-Graph, whereas Hmong would not be subject to such a rule. In sum, Thai, Hmong, and SLQZ provide evidence for the APG analysis of proforms because they instantiate overtly the structure underlying proforms in languages such as German and English.

Before closing this subsection, I want to briefly mention an alternative account for the data discussed so far. Instead of analyzing the relevant data in terms of overlapping arcs, one could suggest that the data in Thai, Hmong, and SLQZ instantiate a structure involving appositive relative clauses attached to an invisible proform; cf. Postal 1972 for such an approach. Under this analysis, (2a) would have the simplified structure in (12).

(12)   Pov always praises ~~himself,~~ [$_S$ ~~who is~~ Pov].

There are however two problems with this analysis. First, it fails to explain why the relevant two nominals have to be identical because appositive relative clauses do not necessarily involve a predicate nominal that is identical to the subject. In other words, nothing precludes the following structures.

(13)   a. He always praises ~~himself,~~ [$_S$ ~~who is~~ Pov].
       b. Pov always praises ~~himself,~~ [$_S$ ~~who is~~ the teacher].

But as shown in (6)-(8), the resulting sentences to such structures are sharply ungrammatical. The second problem is that quantificational expressions generally make bad predicate nominals.

(14)   * John is everyone.

But then, one fails to explain why predicate nominals in at least Hmong are grammatical because the corresponding source structure would involve an appositive relative clause generally unavailable.

(15)   Everyone always praises ~~himself,~~ [$_S$ ~~who is~~ everyone].

To conclude, the alternative analysis for the data in Thai, Hmong, and SLQZ faces problems the analysis developed here does not face, according to which these languages involve overlapping arcs in the S-Graph.

7.2.3 Resumptive Pronouns

Consider the definition of Replace, repeated for convenience in (16).

(16)   Def.: *Replace*
        Replace (C,B) ↔ Neighbor (C,B) ∧ Sponsor (B,C) ∧ ∃A (Erase (A,B))

The general structure determined by this definition is shown in (17).

(17)
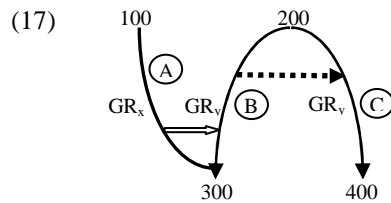
What is of importance for the discussion to follow is the relation between the arcs A and B. The structural context proforms appear in as markers of coreference is identical to the one in (17), that is, to a context where both A and B are initial arcs, as shown in (18) for (19).

(18)
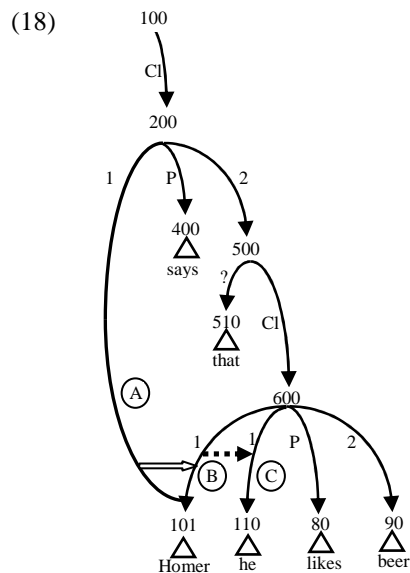
(19)   Homer says that he likes beer.

But the definition of Replace is actually silent on the issue of whether or not A and B are initial arcs: it only requires the erasure of B by A, without putting any constraint on the issue of whether A and B are initial arcs or not. In other words, nothing bars the Replace configuration sketched in (20), where the seconder A is not an initial arc, but a successor-I of the replacee B, that is, sponsored by B.

(20)
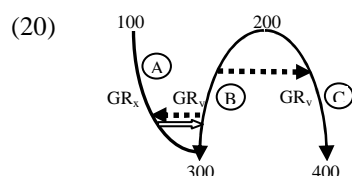
Having this option at one's disposal paves the way for a simple treatment of resumptive pronouns. For what the structure in (20) illustrates is simply the general scheme for a configuration in which the presence of a successor-I correlates with the presence of a proform. Since successors-I are employed for all kinds of extractions, the scheme in (20) simply captures that extractions permit the presence of proforms, which proforms are usually called resumptive pronouns. Some examples for resumptive pronouns are given in (21) from Tyrolean German, Cape Verdean Creole, Polish, and English (resumptive pronouns are set in **bold** in the remainder of this section).

(21)   a.   Welches Haus glapsch du [s dass i mi frain tat [s wenn der Peter **'s** kaafn tat]]?
               which   house believe you that I me enjoy did if   the Peter it buy   did
               Which house do you think that I would be happy if Peter would buy?
                                                                      (Alber 2008, ex. 24a)
        b.   Ki   mudjeris ki dja   bu atxa un omi [s ki   papia ku-**es**]?
               which women   that already you find a man   that talked with-them
               Which women did you find a man that talked with them?
                                                                      (Alexandre 2009, p. 109, ex. 54)
        c.   Jakiego obrazu ja zadzwoniłem do Marii [s po   **jego** namalowaniu]?
               which   picture I called   to Maria after it   painting
               Which painting did I call Mary after painting it?
                                                                      (Szczegielniak 2004, ex. 70a)
        d.   I just saw the girl who Long John's claim that **she** was a Venusian made all the headlines.
                                                                      (Ross 1986, ex. 6.154a)

To make the abstract structure a bit more concrete, consider the partial structure in (22) for the Tyrolean German example from (21a).

(22)
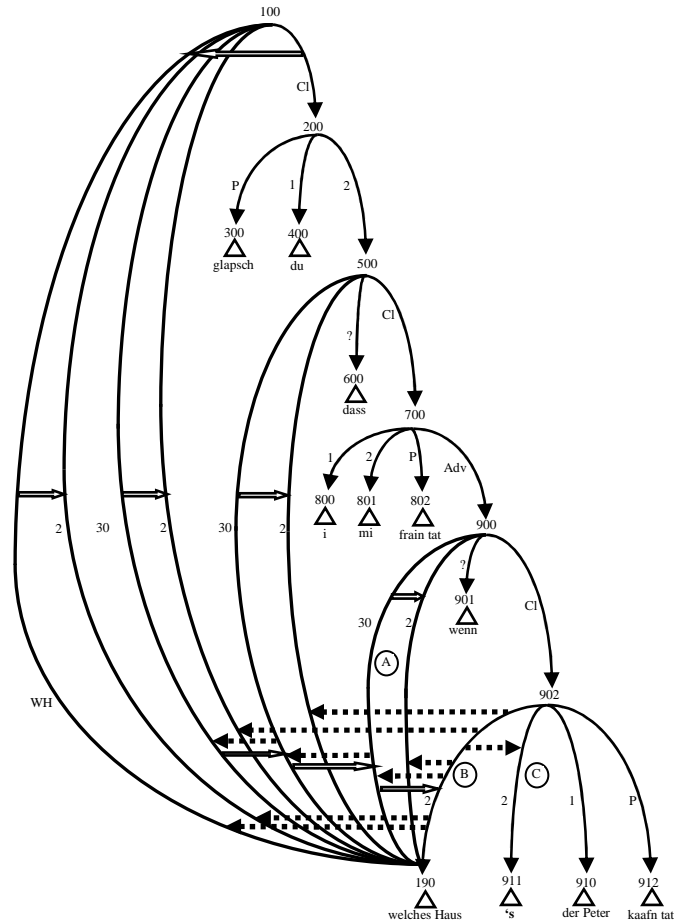
In this structure, the resumptive pronoun heading the replacer arc C is permitted because the direct object arc B in the most deeply embedded clause headed by *welches Haus* overlaps the 30-arc A, which erases B, as a consequence of which the presence of C is permitted.

Despite the fact that resumptive pronouns are a well-known phenomenon, there is a problem dubbed 'McCloskey's Generalization' in Asudeh 2011, p. 122, which is quoted in (23).

(23)   *"A remarkable but little commented on property of resumptive pronouns is that they simply are 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."*

(McCloskey 2002, p. 192)

The generalization is that resumptive elements are always proforms. The problem with this generalization is that internal to assumptions of all dominant syntactic frameworks, structures involving anaphoric pronouns and extraction constructions differ sharply: the former mark coreference, the latter the presence of movement (or, alternatively, of an unbounded dependency). Since these two contexts have nothing in common[5], it is surprising that they permit the presence of the same set of elements, viz. pronouns. But internal to APG, this comes as no surprise: both contexts involve *overlapping arcs* such that one of them erases the other. And it is precisely this similarity that allows for the presence of a proform in both contexts. Again, the difference between extraction and coreference is simply whether the two overlapping arcs are also related via sponsor. In the case of coreference they are not, in the case of extraction they are.

A possible objection to the analysis for resumptive pronouns just developed might hold that the presence of proforms in extraction contexts is actually independent of extraction but only serves as a repair strategy for those cases of extraction that violate island constraints. In other words, extraction is not the relevant factor responsible for the presence of proforms, but island violation is. In light of the data presented in (21), this makes sense for all of them involve extraction out of islands: in (21a) and (21c), extraction targets an element in an adjunct clause, in (21b) extraction targets an element inside a relative clause, and in (21d), extraction targets an element inside a complex NP. And indeed, the view that the presence of proforms in extraction contexts is restricted to those contexts involving island violations is widespread (cf. McCloskey 2006). Despite its popularity, this view is not well supported because the presence of a resumptive pronoun does not generally rescue island violations. Some languages allow proforms in extraction contexts but these nonetheless do not repair island violations[6]. The languages with this property I briefly examine are Vata, Standard Arabic, and Modern Greek. Consider first Vata. Vata requires resumptive pronouns, although only in subject position.

---

[5] This claim probably sounds like an exaggeration because both coreference and extraction involve *coindexing*. Although correct, the two types of coindexing have very different properties, which is why they are often kept apart, the former being called 'A-binding', the latter called 'A'-binding'. Among the differences one finds that (i) A-Binding is restricted to NPs, whereas A'-Binding is not; (ii) A-Binding has a binder in an argument position, A'-Binding must not have a binder in an argument position; (iii) A'-Binding is subject to crossover constraints, A-Binding is not; (iv) A'-Binding is subject to island constraints, A-Binding is not. In sum, the apparent similarity between extraction and coreference is more the result of the apparent misuse of indices for two quite different phenomena.

[6] I will not discuss another problem that arises under such view, viz. that in many languages island violations cannot be circumvented by the insertion of proforms, as in German.

(i)   a. *Welcher Mann kennst du   die Frau   [s die t/**er** liebt]?
          which   man know you the woman who he loves
          Which man do you the woman that loves?
      b. *Welchen Mann kennst du   die Frau [s die t/**ihn** liebt]?
          which   man know you the woman who him loves
          Which man do you the woman that loves?
      c. *Das ist der Mann [s der ich die Frau   kenne [s die t/**er** liebt]].
          That is the man   who I the woman know   who he loves
          That's the man who I know the woman that loves.
      d. *Das ist der Mann [s den ich die Frau   kenne [s die t/**ihn** liebt]].
          That is the man   who I the woman know   who him loves
          That's the man who I know the woman that loves.

(24)   a. Àló *(**Ò**) lē saká la?
           who he eat rice Q
           Who is eating rice?
       b. Yī   kòfí lē (***mí***) la?
           what Kofi eat it   Q
           What is Kofi eating?

                                                                    (Koopman 1982, ex. 1)

Nevertheless, such resumptive pronouns do not ameliorate island violations, as shown in (25) with extraction out of a wh-island.

(25)   a.* Àló `n   nI [ₛ zĒ   mĒmE gbU **Ò** dI ßO mÉ] yì   la?
           who you NEG reason it   for he cut REL it   know Q
           Who don't you know why cut it?
       b.* Àló `n   nyla   [ₛ nyni nā **Ò** dI mÉ] la?
           who you wonder   whether he cut it   Q
           Who do you wonder whether cut it?
                                           (Koopman & Sportiche 1986, ex. 19a & ex. 19b)

Importantly, the ungrammaticality of the examples in (25) is not due to a general unavailability of extraction out wh-clauses, as shown by *object* extraction out of a wh-clause, which does not trigger an island-effect.

(26)   Àló `n    nI  [ₛ zĒ   `n ka ßO t nyE] yì   la?
       who you NEG   thing you FUT REL   give know Q
       Who don't you know what you will give to?
                                                (Koopman & Sportiche 1986, ex. 17a)

Extraction of an object does not allow a proform (cf. ex. 24b) and is insensitive to a wh-island (cf. ex 26), whereas subject extraction requires a proform (cf. ex. 24a) and is sensitive to the wh-island (cf. 25). If proforms were a device to rescue otherwise illicit extraction configurations, the distribution of subject and object resumptive pronouns should have been the other way round.
Consider next Standard Arabic, as reported in Demirdache 1991.

(27)   a. Man ra?ayta(-**hu**)?
           who saw.you-him
           Who did you see?
       b.* Man ra?ayta l-fataata [ₛ llatii ðarabat-**hu**]?
           who saw.you the-girl   that hit-him
           Who did you see the girl that hit?
       c. Qara?tu l-maqaalata llatii saafara š-šaabu   [ₛ llaðii kataba-**ha**].
           read.I   the-article   that travelled the-young.man   that   wrote-it
           I read the article that the young man travelled who wrote it.
                                                         (Demirdache 1991, ex. 42 & 43)

(27a) shows that Standard Arabic allows the optional presence of a proform in extraction contexts. (27b) shows that this proform is not capable of ameliorating an island violation. Crucially, this has nothing to do with a general defect of proforms in extraction contexts because as (27c) shows, such a proform in a relative clause is insensitive to island constraints. The data from Standard Arabic show that island-sensitivity is not a yes-no property of proforms in extraction contexts, but depends on the type of extraction involved[7].

Finally, consider (28a) and (28b) from Greek[8].

(28) a. Aftós íne o ádras [S ton opíon pístevo [S oti i María (?**ton**) aɣapái]].
         this is the man who I.believe that the Maria him loves
         That's the man that I think Mary loves.
     b.* Aftós íne o ádras [S ton opíon ɣnorízo [NP ti jinéka [S pu (**ton**) aɣapái]]].
         this is the man who I.know the woman that him loves
         That's the man that I know the woman who loves.

Greek optionally allows a proform in the context of extraction of a relative proform, as (28a) shows. But such proforms have no influence on the island sensitivity of the relative proform extraction, as (28b) illustrates: the presence of the resumptive doesn't rescue the island violation although resumptive proforms are available in non-island cases. In sum, the view according to which proforms can appear as reflexes of extraction is superior to one that ties such proforms to the presence of an island violation. This observation is not incompatible with the idea that *some* proforms can rescue island violations; but the presence of a proform is not a sufficient condition for the absence of island effects.

Last, I turn to resumptive pronouns found in contexts usually called 'A-movement' in transformational terms, viz. raising constructions, both Subject-to-Subject Raising (SSR), Subject-to-Object Raising (SOR), and Object-to-Subject Raising (OSR) exemplified in (29).

(29) a. Homer seems e to like beer.   (SSR)
     b. I expect Homer e to like beer.   (SOR)
     c. John is easy to please e.   (OSR)

In a couple of languages, the positions in (29) featuring a gap in English (marked by 'e') manifest an overt proform. Languages with proforms in SSR environments, so-called *Copy Raising*, include Igbo, Haitian Creole, English, Greek[9], and Turkish, as illustrated in (30)-(34), respectively.

---

[7] Possibly, it might even depend on morphological properties of the extracted constituent. As Demirdache 1991, p. 45-6 shows, wh-question extraction of complex wh-phrases behaves differently.
[8] The judgments were provided by Vasiliki Koukoulioti and Marika Lekakou (p.c., 2012/01/26). After obtaining the judgments, I became aware of a paper by Merchant dealing with similar structures (cf. Merchant 2004).
[9] The Greek examples for both SSR and SOR were kindly provided by Vasiliki Koukoulioti (p.c., 2012/02/15). Similar examples are discussed in Joseph 1976 and Perlmutter & Soames 1979, ch. 43.

(30) a. Ó   dì   ´m   [_S kà   Ézè hũ-rũ   Adá].
          EXPL seems to.me   that Eze see-ASP Ada
          It seems to me that Eze saw Ada.
      b. Ézè dì   ´m   [_S kà   **o** hũ-rũ   Adá].
          Eze seems to.me   that he see-ASP Ada
          Eze seems to me to have seen Ada.
      c.* Ézè dì   ´m   [_S kà   t hũ-rũ   Adá]].
          Eze seems to.me   that see-ASP Ada
          Eze seems to me to have seen Ada.
                                                   (Ura 1998, ex. 1a, ex. 1b, & ex. 11)

(31) a. Sanble [_S Jan   pati].
          seem   John left
          It seems that John left.
      b. Jan sanble [_S **li**   pati].
          Jan seem   he leave
          Jan seems to have left.
      c.* Jan sanble [_S t pati].
          Jan seem   leave
          Jan seems to have left.
                                                   (Deprez 1992, ex. 3a, ex. 4a, & 4d)

(32) a. It looks like Homer drank a whole crate of beer.
      b. Homer looks like **he** drank a whole crate of beer.
      c.* Homer looks like t drank a whole crate of beer.

(33) a. Fénete   [_S óti   i   kópeles pínane   símera].
          seem.3.SG   that the girls   be.hungry.3.PL today
          It seems that the girls are hungry today.
      b. I   kópeles fénonde [_S na **pro** pínane   simera].
          the girls   seem.3.PL   that   be.hungry.3.PL today
          The girls seem to be hungry today.

(34) a. San-a   [_S biz-Ø   viski-yi   iç-ti-k]   gibi görün-dü-Ø
          you-DAT   we-NOM   whiskey-ACC drink-PST-1.PL like appear-PST-3.SG
          It appeared to you that we drank whiskey.
      b. Biz-Ø   san-a [_S viski-yi   **pro** iç-ti-k]   gibi görün-dü-k.
          we-NOM   you-DAT whiskey-ACC   drink-PST-1.PL like appear-PST-1.PL
          We appeared to you to have drunk the whiskey.
                                                   (Moore 1998, ex. 8a & ex. 22b)

All examples feature a proform in the position where the raised constituent orginates. That extraction is involved in Copy Raising constructions is suggested inter alia by the fact that they all permit idiom chunks (cf. op. cit.). The presence of a zero proform (abbreviated as 'pro' in the remainder of this section) in both Greek and Turkish can only be detected indirectly, via via the presence of agreement on the embedded verb because neither Greek nor Turkish have weak subject proforms. A

possible objection to this account might be that since both Turkish and Greek also lack infinitives, the agreement effect might be attributed to an independent mechanism. However, at least in Greek, the proform can appear overtly if it is focused, which is required if the proform is modified by 'only', as observed by Perlmutter & Soames 1979, chapter 43.

(35)   I   kópeles fénonde   [$_S$ na   pínane   simera **móno aftés**].
       the girls   seem.3.PL   that be.hungry.3.PL today   only   they
       Only the girls seem to be hungry today.

Both Greek and Turkish also feature proforms in SOR.

(36)   a. Periméno [$_S$ oti   o   Jánnis   θa   érθi].
          I.expect   that the Jannis.NOM FUT come.3.SG
          I expect that Jannis will come.
       b. Periméno to Jánni   [$_S$ na   **pro** érθi].
          I.expect the Jannis.ACC   that   come.3.SG
          I expect Jannis to come.

(37)   a. [$_S$ Sen   öl-dü-n]   san-iyor-du-m[10].
             you-NOM die-PST-2.SG believe-PROG-PST-1.SG
          I believed that you have died.
       b. Sen-i   [$_S$ **pro** öl-dü-n]   san-iyor-du-m
          you-ACC   die-PST-2.SG believe-PROG-PST-1.SG
          I believed you to have died.

                                                        (Moore 1998, ex. 41b)

Although the evidence for proforms is only indirectly available via verb agreement in Greek and case alternation in Turkish , Greek again offers more direct evidence via a proform modified by 'only'.

(38)   Periméno to Jánni   [$_S$ na   érθi   **mono aftos**].
       I.expect the Jannis.ACC   that come.3.SG only   he
       I expect only Jannis to come.

The simplified structures for the SSR and SOR constructions in Greek are illustrated in (39) and (40).

---

[10] The example was kindly provided by Özlem Ünal (p.c., 2012/02/20).

(39) 100

Cl

200

1   P   2

400
fenonde   500

?

510   Cl
na

A

600

1   1   P   Adv

B   C

101   110   80   90
í kopéles   pro   pínande   símera

(40) 100

Cl

200

1   P   2   ?

300   400
pro   periméno

A   500

?

600   Cl
na

1   700

1

B   C

410   800   900
to Jánni   pro   érθi   P
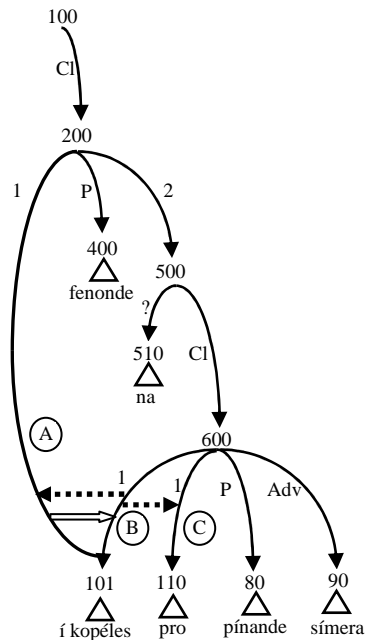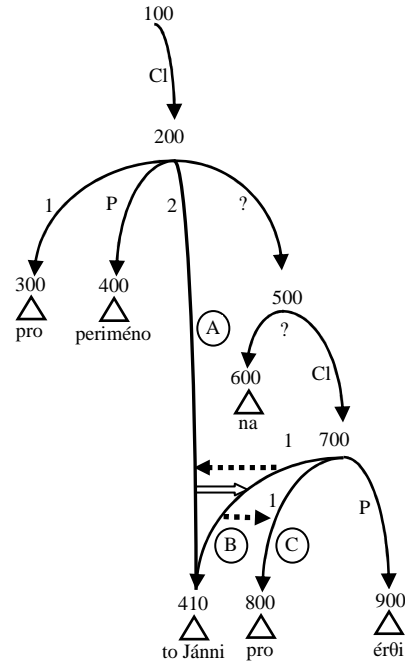
As can be seen, the sponsored arc A erases its predecessor B, as a consequence of which a Pro arc C is allowed, through the definition of Replace. Finally, Spanish and French feature a profom in OSR constructions.

(41) a. Esta carta es difícil   [s de escribir (-**la**) al presidente].
          this letter is difficult   to write   -it   to president
          This letter is difficult to write to the president.

(Moore 1990, ex. 16b)

      b. L'auteur   de ce livre serait   facile [s à trouver **pro**].
          the'author of this book would.be easy   to find
          The author of this book would be easy to find.

(Postal 1994b, ex. 3c)

The presence of a proform in French OSR-constructions is suggested by the fact that contexts barring proforms also bar OSR.

(42) a.* L'auteur,   je l'en   connais bien.
          the'author I   him'of.it know   well
          The author of it, I know him well.

      b.* L'auteur   serait   facile [s à en   trouver].
          the'author would.be easy   to of.it find
          The author of it would be easy to find.

(Postal 1994b, ex. 9c & 3d)

The simplified structure for the Spanish OSR construction is sketched in (43).

(43)
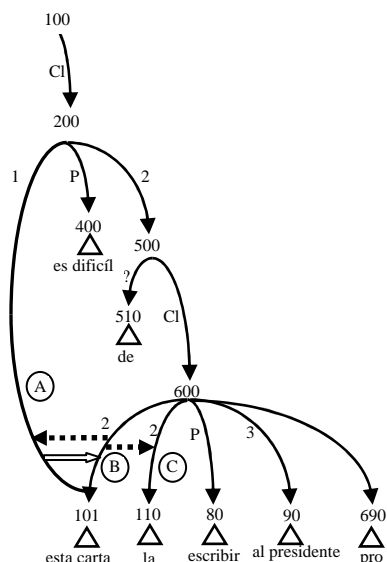
Also here, A erases B, as a consequence of which the replacer arc C is permitted.
In sum, extraction constructions often feature proforms, a fact easily captured by the
APG view of proforms[11].

---

[11] The equivalents of SSR, SOR, and OSR involving overlapping initial arcs (corresponding to subject
control, object control, and object deletion) can also feature proforms at the position of the erased arc in
some languages, although these do not count as false proforms. For example, Greek features obligatorily
overt proforms in object deletion constructions, cf. (i).

(i) I   María íne ómorfi   [s na*(**tin**) kitás].
     the Maria is beautiful   to   her look.at
     Maria is beautiful to look at.

(Alexopoulou 2006, ex. 6a)

In addition to this, control has been argued by Postal 1970 to involve invisible proforms in both subject
and object control in English, and French seems to possess empty subject pronouns in the context of
subject control. The conclusion for French derives from the following observations. First, as mentioned in
connection to SOR in French, *en* is incompatible with proforms. Second, *en* cannot have a source NP that
is a subject (Tasmowski 1990). Third consider the following contrasts mentioned in Ruwet 1991.

(ii)   a.   *L'auteur en   semble être genial.
            the'author of.it seems be brilliant
            The author of it seems to be brilliant.
       a.   *L'auteur en   prétends être genial.
            the'author of.it claims   be brilliant
            The author of it claims to be brilliant.

(iii) a.   √ L'auteur semble en   être genial.
            the'author seems of.it be brilliant
            The author of it seems to be brilliant.
       b. * L'auteur prétends en   être genial.
            the'author claims   of.it be brilliant
            The author of it claims to be brilliant.

(Ruwet 1991, p. 265, fn. 4 & p. 57, ex. 8)

7.2.4 False Reflexives

Apart from contexts where reflexives are present as markers of the coreference between two arguments, reflexives also appear in contexts where no such characterization is possible. (44) illustrates the former case, (45) the latter.

(44) a. Homer mag sich.
          Homer likes himself.
     b. Homer rasiert sich.
          Homer shaves himself.

(45) a. Das Buch liest sich leicht.
          the book reads SELF easily
          The book reads easily.
     b. Homer erkältet   sich.
          Homer catches.a.cold SELF
          Homer catches a cold.
     c. Homer streitet sich.
          Homer quarrels SELF.
          Homer quarrels.

Following Blake 1990, I call the type of reflexives used in the examples (45) *false reflexives*[12]. What distinguishes these examples from the ones in (44) is that those in (44) involve a two-place predicate, whereas the ones in (45) involve a one-place predicate. In other words, whereas the reflexives in (44) truly mark a reflexive relation, the reflexives in (45) do not, because there are no two initial arguments. Similar to the problems discussed in connection to proforms, these two uses of reflexives have nothing in common[13].

The sentences in (ii) are both ungrammatical because *en*-cliticization targets a subject. The status of the sentences in (iii) however differs: whereas *en*-cliticization can target the embedded clause of a raising-predicate (cf. iia), it cannot target the embedded clause of a control predicate (cf. iib). This strongly suggests that the subject position of the clause embedded under a control predicate contains an invisible proform, with which *en* however is incompatible. Incidentally, that *en*-cliticization can target the subject in these embedded clauses is due to the fact that *être* is an unaccusative predicate, that is, its surface subject is an underlying object.

[12] I will exclude from my discussion *emphatic reflexives* as found in English, cf. (i).

(i)   Peter claimed that he himself wrote the paper.

[13] Haider 1985 attempts to give a unified account for the distribution of *sich* in German, but eventually ends up highlighting the difference between the uses in (44) and (45). In a nutshell, *sich* in (45a) is an element that reverses the alignment of thematic roles to arguments such that the role usually borne by the first argument is assigned to the second object, and vice versa (p. 250), whereas *sich* in (45b) is nothing but a formal reflex of the no longer productive alternation observed in (45a), cf. p. 251. As Haider himself notes, *sich* is not coreferent in either example. And this is precisely the problem: why is an element used to mark an argument alternation that also marks coreference? Both uses have nothing in common, and nothing under this view favors using *sich* over the use of the word *Gorilla* in such contexts. Steinbach 2004 analyzes *sich* as a marker of valency reduction in the examples in (45). This analysis faces the same problem as Haider's analysis: why use *sich* for this purpose and not the word *Gorilla*? For *sich* as a marker of coreference does not involve any kind of valency reduction. Moreover, Steinbach is forced to

I want to show now that the APG analysis of proforms can unite both uses of reflexives under a single mechanism. As shown in the last section of the previous chapter, reflexives are permitted if they head a replacer arc C that has a neighboring seconder A, as illustrated in (46).

(46)
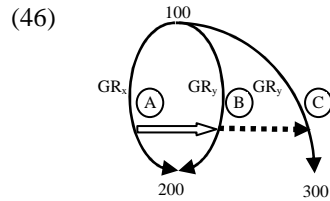
This structure is present in the examples (44), as illustrated in (47) for (44a).

(47)
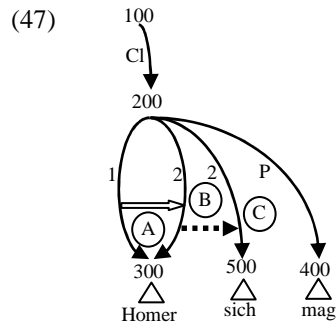
This structure needs no special comment: arc A erases the overlapping initial arc B, and since they are neighbors, the Pro arc C headed by a reflexive proform is permitted. But similar to resumptive pronouns, the definition of Replace is silent about a possible sponsor relation between A and B. In other words, the presence of a reflexive pronoun is also permitted in the following structures where B sponsors A, as in (48), or A sponsors B, as in (49)

(48)

(49)
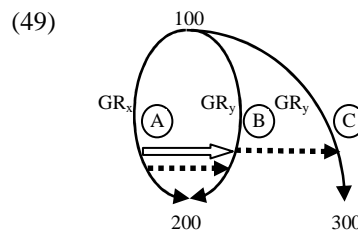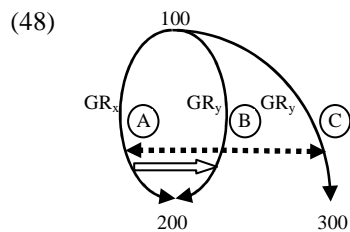
These two structures do not involve initial overlapping arcs, and so no reflexive relation is present, since a reflexive relation requires two *initial* arcs, whereas the

---

assume that inherently reflexive verbs like *sich streiten* (Engl. to quarrel) or *sich erkälten* (Engl. to catch a cold) derive from a source predicate that is transitive. However, no such transitive counterparts exist.

structures in (48) and (49) each involve only *one* initial arc. But what matters for the presence of a reflexive pronoun is the presence of neighboring seconder. And as arcs represent grammatical functions, APG allows reflexives in all those cases where clause internal grammatical function changing operations occurred because these involve erasure of arcs.

The structure in (48) is instantiated in two of the contexts illustrated in (45), viz. in middles and reflexive unaccusative predicates, corresponding to the examples (45a) and (45b), respectively. The structure for the middle construction in (45a) is given in (50), adopted from Postal 2010, p. 168.

(50)
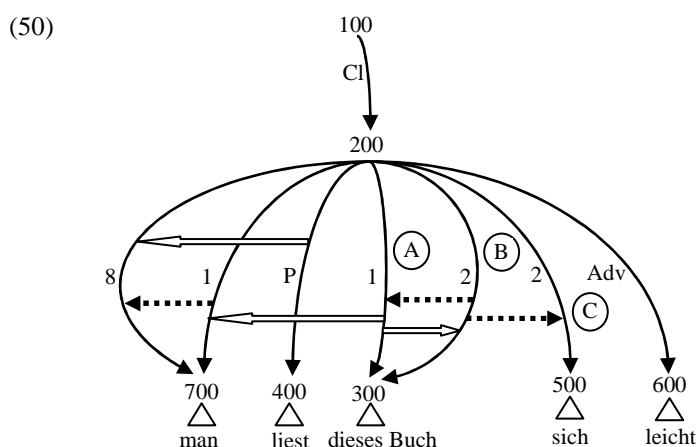
Middles are analyzed as reflexive passive clauses in APG (cf. Postal 1986, 2010), and therefore feature two differences in comparison to active clauses. First, the initial direct object is advanced to subject, and the underlying subject is demoted to the chômeur relation; second, the chômeur is erased by the predicate arc[14]. The structure renders middles similar to passives, which also involve object to subject advancement plus demotion of the initial subject to chômeur. This should come as no surprise because despite the lack of passive morphology, middles don't have an interpretation typical for active clauses. The erasure of the chômeur is a language particular property of English, German and possibly other languages[15]. It captures that in these languages, chômeurs are never visible as surface phrases in middles, in contrast to regular passives. In addition, that the element heading the 1- and the 8-arc is *man* (Engl. *one*) is not an arbitrary choice but accounts for another observation concerning the interpretation of middles, viz. they receive a generic, non-specific interpretation, similar to the one the word *man* in German expresses.

The structure for (45b) is illustrated in (51).

---

[14] Erasure of chômeurs by a predicate arc is restricted to those chômeurs headed by elements like *man*.

[15] It is not a universal property because in Lower Sorbian, chômeurs do surface in middles.

(i)   Ja se   wot sotše   wobalim.
      I REFL by sister.GEN bandage.1.SG
      I am bandaged by the sister.

<div align="right">(Janas 1984, p. 314)</div>

(51)
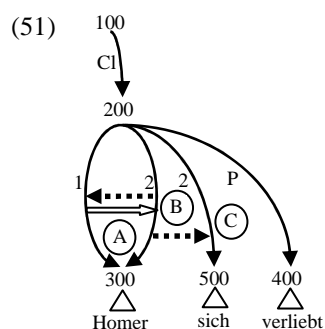
Arc A is successor-I of B, that is, A erases B, which si replaced by arc C. Another reflexive unaccusative predicate is *sich verlieben* (Engl. to fall in love):

(52)   Homer verliebt   sich.
       Homer falls.in.love SELF
       Homer falls in love (with someone else).

That both predicates are unaccusatives and not reflexive transitives or reflexive unergatives is suggested by three observations. First, if they were transitive predicates, we would expect to find a diverse variety of nominal constituents in object position, contrary to fact.

(53)   a.* Homer verliebt Marge.
             Homer falls in love Marge.
       b.* Homer erkältet Marge.
             Homer catches a cold Marge.

Second, similar to all transitives and unaccusatives, the past participle derived from such predicates can be used as an attribute to its underlying object, cf. (54c), in contrast to unergatives, cf. (54e).

(54)   a. Der verliebte/   erkältete Mann.
            the fallen.in.love/ recovered man
            The man who is fallen in love/ caught a cold.
       b. Die Frau hasst den Mann.
            The woman hates the man.
       c. Der gehasste Mann.
            the hated man
       d. Das Kind spielt.
            The child plays.
       e.* Das gespielte Kind.
            *The played child.

Third, just like plain, that is, non-reflexive, unaccusatives such as *fallen* (Engl. to fall), neither *sich verlieben* nor *sich erkälten* allow impersonal passives.

(55)   a.* Hier wird   sich oft   verliebt.
             here becomes SELF often fallen.in.love
             One often falls in love here.
        b.* Hier wird   sich oft   erkältet.
             here becomes SELF often caught.a.cold
             One often catches a cold here.

The structure in (49) is the one that underlies what I would call reflexive unergatives, corresponding to (45c)[16]. Such predicates – often not too happily called inherent reflexive predicates[17] – are characterized by a local 2-successor-II to an initial 1-arc, that is, there is an underlying unergative verb whose 1-arc sponsors and erases an overlapping direct object arc. Given this erasure, a reflexive is permitted. The German predicate *sich streiten* (Engl. to quarrel) from example (45c) is arguably such a predicate. Its structure is sketched in (56), adopted from Postal 2010, p. 39.

(56)

Here too an analysis that treated *sich streiten* as a transitive or an unaccusative predicate is incompatible with a number of observations. First, similar to the reflexive unaccusatives, such verbs are not transitive predicates because they are incompatible with any other nominal constituent other than a reflexive.

(57)   * Homer streitet Flanders.
           Homer quarrels Flanders.

In contrast to unaccusatives but similar to plain, non-reflexive, unergatives, the past participle of *sich streiten* cannot be used as an attribute to its argument.

(58)   a.* Der gestrittene Mann.
             The quarreled man.
        b.* Das gespielte Kind.
             The played child.

---

[16] Other reflexive unergatives in German include *sich freuen* (Engl. to be pleased), *sich schämen* (Engl. to be ashamed), *sich übergeben* (Engl. to throw up), and *sich verschlucken* (Engl. to choke), *sich verhalten* (Engl. to behave), *sich weigern* (Engl. to refuse), *sich prügeln* (Engl. to have a fight).
[17] This terminology is avoided here because it does not distinguish between reflexive unaccusatives and reflexive unergatives, both of which are inherently reflexive.

However, *sich streiten* can be used in impersonal passives, similar to plain unergatives.

(59) a. Hier   wird   sich gestritten.
          here   becomes   SELF quarreled
          One quarrels here.
      b. Hier   wird   nicht gespielt.
          here   becomes   not   played
          One must not play here.

Incidentally, the different passivization possibilities for the classes of inherently reflexive intransitive predicates follow without further specification from APG assumptions about passive clauses coupled with general sentence laws. The general characteristics defining periphrastic passive clauses in APG are (i) the presence of a 1-arc successor A, (ii) the erasure of A by its predecessor B[18], (iii) the erasure of some distinct 1-arc C by A, and (iv) the presence of an 8-arc successor D whose predecessor is C. This is illustrated in (60), adapted from Postal 2010, p. 145.

(60)
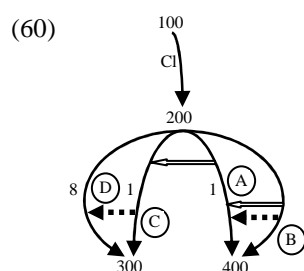
Now consider the partial structures for (55b) and (59b), respectively, ignoring adverbials, negation, the auxiliary, as well as the subject of the auxiliary, which is analyzed as an R-F-successor-I of the 2-arc B.

(61)

(62)

---
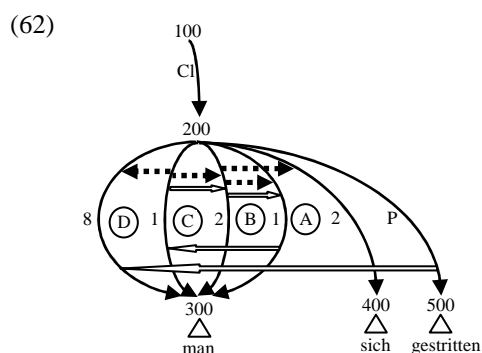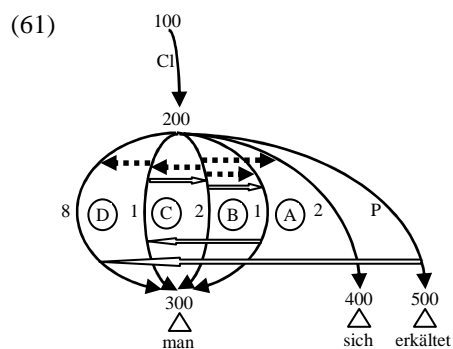
[18] Middles, which are analyzed as synthetic passives in APG, involve the opposite erasure, that is, A erases B, as shown in structure (50). In addition, the label of B is deliberately unspecified because passives can be formed not only on original direct objects, cf. Postal 1986.

The naming of the arcs in these two structures[19] corresponds to the one in (60). The reason that the structure in (62) is well-formed but not the one in (61) has to do with a difference between the successors of the arc B in both structures. B in structure (62) containing the reflexive unergative predicate *sich streiten* (Engl. to quarrel) has only one 1-arc successor, but B in (61) containing the reflexive unaccusative predicate *sich erkälten* (Engl. to catch a cold) has two 1-arc successors. However, having two 1-arc successors within a single clause violates a fundamental law of sentence structure, viz. the 1-Advancement Exclusiveness Law, inherited from Relational Grammar (cf. Perlmutter 1983, p. 151), according to which no clause must contain two advancements to subject, cf. (63).

(63)   *The 1-Advancement Exclusiveness Law*
        Successor (A,B) $\wedge$ 1-Arc (A) $\wedge$ Successor (C,D) $\wedge$ 1-Arc (C) $\rightarrow$ A = C

Evidently, (63) is violated in (61) because B has two distinct 1-arc successors, viz. A and C, but not in (62) because B has only one 1-arc successor, viz. A. Consequently, passives can be formed on reflexive unergatives, but not on reflexive unaccusatives, which is paralle to the behavior of non-reflexive unergatives and unaccusatives.

Lastly, one might wonder whether the difference between true reflexives, which involve overlapping initial arcs, and false reflexives, which do not, has detectable consequences in some aspects of grammar. There is a property that distinguishes true reflexives from false reflexives, irrespective of whether they occur in middles, unaccusatives, or unergatives. For whereas true reflexives can be extracted clause internally, false reflexives cannot, as the contrast between (64) and (65) indicates.

(64)   a. Herself, Lois criticized t.
        b. Herself, Lois described t to the caller.
        c. Herself, Lois worked t very hard.

(65)   a.* Herself, Lois perjured t.
        b.* Herself, Lois devoted t to her sheep.
        c.* Herself, Lois never exerts t.

<div align="right">(Postal 1998, p. 126)</div>

This observation carries over to German, as observed by Reis 1982, who also observed that it even extends to reflexives in middles.

(66)   a.* Sich liest   das Buch t leicht.
            SELF reads the book   easily
            The book reads easily.

---

[19] That the element heading the 1- and the 8-arc in both structures is *man* (Engl. one) is suggested by two observations. First, passives of reflexive intransitive verbs receive a generic, non-specific interpretation, similar to middles. Second, they are restricted to such an interpretation. In other words, subjects other than *man* result in sharp ungrammaticality, cf. (i).
(i) *Hier wird   sich/ mich oft   von mir gestritten.
     here becomes SELF me   often by me quarreled
     I like to quarrel often.

    b.*	Sich	erkältet	Homer t.
        SELF	catch.a.cold	Homer
        Homer catches a cold.
    c.*	Sich	streitet	Homer t.
        SELF	quarrels	Homer.
        Homer quarrels.

One could object that the non-extractability of false reflexives is not an exclusive property of these elements in German because the false reflexive share this property with one true proform, viz. *es* (Engl. it), cf. (67).

(67) a.	Das	Geld	habe ich	verloren.
        the.NEUT	money	have I	lost
        I lost the money.
    b.*	Es habe ich	verloren.
        it	have I	lost
        I lost it.

However, as Meinunger 2007 showed, the extractabitlity of *es* is dependent on additional factors. More specifically, if the clause contains what Meinunger calls a 'low subject' (usually corresponding to a non-specific indefinite) or a speaker oriented or sentence adverbials, then the extraction of *es* results in grammaticality, as revealed in (68b), which features both factors.

(68) a.	Das Geld	hat dann doch jemand	entdeckt.
        the	money	has then	PRT	someone discovered
        Eventually, someone found the money.
    b.	Es hat dann doch jemand	entdeckt.
        it	has then	PRT	someone dicovered.
        Eventually, someone found it.

But these factors are of no help for the sentences with false reflexives, cf. (69).

(69) a.*	Sich	hat dann doch ein Buch t leicht	gelesen.
        SELF	has then	PRT	a	book	easily read
        Eventually, some book read easily.
    b.*	Sich	hat dann doch jemand t erkältet.
        SELF	has then	PRT	someone cought.a.cold
        Eventually, someone caught a cold.
    c.*	Sich	hat dann doch jemand t gestritten.
        SELF	has then	PRT	someone quarreled.
        Eventually, someone quarreled.

To conclude, the APG view of proforms provides a unified characterization for the contexts involving reflexive proforms. The difference between true and false reflexives is a matter of whether or not the relevant overlapping arcs are both initial or not.

7.2.5   Alleged Problems of the APG Treatment of Proforms

Three problems can be raised against the APG treatment of proforms. First, the deictic use of proforms, second, quantified expressions as antecedents to proforms, and third, proxy readings of proform.

7.2.5.1   Deictic Usages of Proforms

As for the first problem, consider (70), containing a proform used deictically.

(70)   He kissed Mary.

In this sentence, the proform *he* lacks an antecedent. But the APG treatment of proforms presupposes that *all* proforms, and therefore the one in (70), have an antecedent. Since no such antecedent is present, the APG analysis of proforms cannot be correct. I have not much to say on this topic here, and refer to Collins & Postal 2012, where this problem is investigated in more detail (cf. their chapter 4). What these authors suggest and argue for is that proforms such as the one in (70) only lack an *overt* antecedent, and that they are connected to an *invisible* antecedent, most likely a discourse-bound element.

7.2.5.2   Proforms Bound by Quantified Expressions

To understand the second problem, consider (71).

(71)   a. Every man thinks that he is intelligent.
          b. Every man likes himself.

Given the idea that proforms depend on overlapping arcs, these sentences would seemingly correspond semantically to sentences in (72).

(72)   a. Every man thinks that every man is intelligent.
          b. Every man likes every man.

The problem is that the sentences in (71) differ in meaning from those in (72): the proforms *he* and *himself* are interpreted as variables bound by *every man* in (71), whereas such a bound variable interpretation of the constituents in (72) underlying the proforms in (71) is impossible. Consequently, (72) cannot reflect the initial arc structure for (71), for otherwise the quantifier *everyone* would be interpreted twice. But then, the structure for (71) must be one where *he* and *himself* are not derived from an occurrence of their antecedent *every man*, thereby challenging the idea that proforms in general are derived from identical occurrences of their antecedents.

However, the problem is only apparent. The argument allegedly showing that (71) does not have an initial arc structure where two arcs headed by *every man* overlap does not go through. For it rests on the false assumption that (72) reflects the initial arc structure for the sentences in (71). More specifically, the argument wrongly presupposes that the two occurrences of *every man* in (71) required under an APG treatment each have quantificational force, as the two occurrences in (72) do. In order to see why (72) does not reflect the initial arc structure for (71), I briefly outline one way to deal with quantifiers in APG. What distinguishes quantifiers from non-quantifiers is that only the former bear scope. So the relevant question is how scope is dealt with in APG. Following suggestions[20] made in Postal 2007, pp. 50-3, I express scope by arcs that specify the scope of the elements heading them. Furthermore, I assume that scope-arcs have to be neighbors of Cl-arcs which erase them. For example, an element such as *every man* not only heads some argumental R-sign, but also a scope-arc, as shown in (73).

(73)
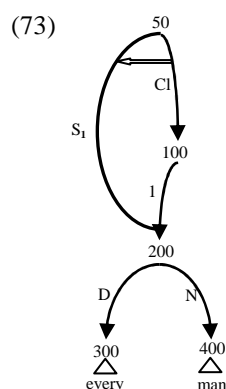
Analyzing scope in this way captures the observation that scope is a structural property, that is, scope is a property of some element in a clause with respect to other elements in this clause. This analysis does not clash with the observation that the ability to bear scope is restricted to only a small set of lexical elements because any framework must distinguish between the set of elements that can bear scope and the fact that scope is a structural property. In other words, every framework has to express that, although *every man* can bear scope, it does so with respect to other elements in a clause. In APG terms, this is expressed by rules restricting the set of lexical elements that can head scope-arcs, which rules are independent of the laws and/or rules that regulate the position of these arcs within a structure. An important property of quantifiers is that they have a *unique* scope within a structure. For example, consider (74).

(74)   Some lady hugged every boy.

---

[20] Although my proposal shares with Postal's the idea that scope is expressed by arcs, the two approaches also differ considerably, for example with respect to the internal structure of scope-arcs. Moreover, needless to say that the treatment of scope via arcs is not a consequence of any assumptions within APG.

This sentence is ambiguous between a reading where *some lady* scopes over *every boy* and a reading where *every boy* scopes over *some lady*. The two readings are expressed by the following two structures.

(75)

(76)
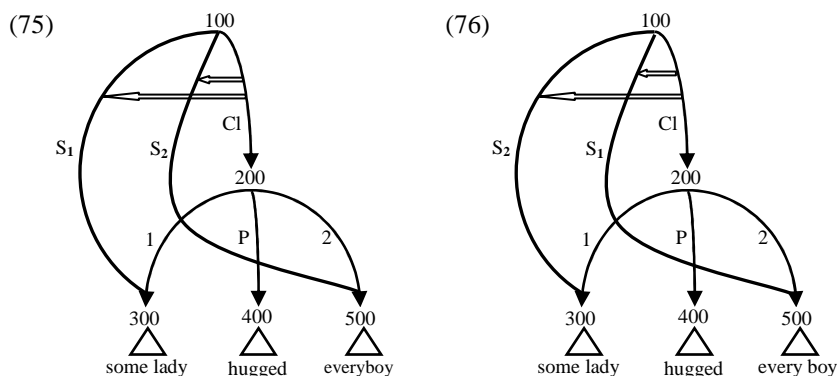
The structure in (75) shows the reading where *some lady* scopes over *every boy*. This is so because if some element A scopes over another element B, then the number internal to A's scope-arc's R-sign is smaller than the number internal to B's scope-arc's R-sign. Since '1' is smaller than '2', the element *some lady* scopes over *every boy*. The numerical properties of the scope-arcs in (76) are reversed; therefore scope between *some lady* and *every boy* is reversed. However, what is not possible is that both (i) *some lady* scopes over *every boy* and (ii) *every boy* scopes over *some lady*. To express this observation[21], I suggest the following law.

(77)   *The No Distinct Scope-Arcs Overlap Law*
        Overlap (A,B) ∧ Scope-Arc (A) ∧ Scope-Arc (B) → A = B

This law therefore excludes the following structure for (74).

---

[21] Although the correctness of this claim seems accepted across different frameworks in my view, it is not trivial to find empirical evidence supporting this claim because having two quantifiers scope over each other has very often no detectable consequences. For example, if in (74*) some lady* scoped over *every boy* and was scoped over by *every boy*, then the resulting reading would be identical to the reading where *some lady* only scopes over *every boy*. Similarly, if a clause contains two universal quantifiers or two existential quantifiers, then relative scope between these two is irrelevant, and so is the assignment of simultaneous relative scope to both. Nevertheless, there are cases that show that simultaneous scope is not instantiated. Consider (i).
(i)   Many boys kissed many girls.
According to the judgments of my English speaking informants, this sentence has two readings. Either the quantifiers take scope according to their surface order or they take inverse scope. Importantly, neither reading entails the other. In other words, if many boys kiss many girls, then this does not entail that many girls were kissed by many boys, and vice versa. So in case there is a situation in which both many boys kissed many girls and many girls were kissed by many boys, then according to my informants (ii) has to be used.
(ii) Many boys kissed many girls and many girls were kissed by many boys.
The necessity to do so follows neatly under the assumption that a quantifier can only be assigned a unique scope because if multiple scope assignment were possible, then (i) should suffice to express the relevant meaning. But it doesn't, thereby indicating that a quantifier can only be assigned a unique scope.

(78)
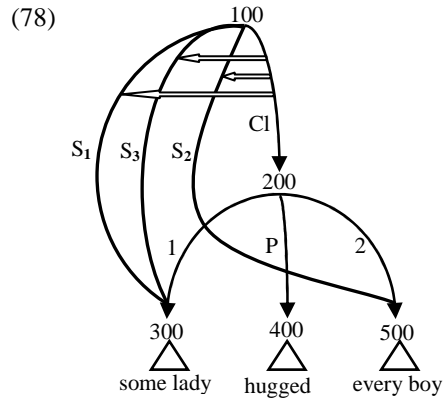
In this structure, the subject heads two scope-arcs and the object one scope-arc. Given the numbers specified internal to the R-signs of the scope-arcs, the subject both scopes over the object and is scoped over by the object. Such a situation where two elements scope over each other is precluded by the No Distinct Scope-Arcs Overlap Law.

This law now is the key to the understanding why the sentences in (72) are not the sources for the sentences in (71). If the sentences in (71) really involved one element that has quantificational properties in both positions it occurs in, the structures for the two sentences would look as follows.

(79)

(80)
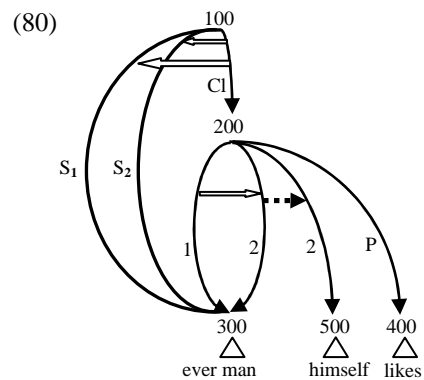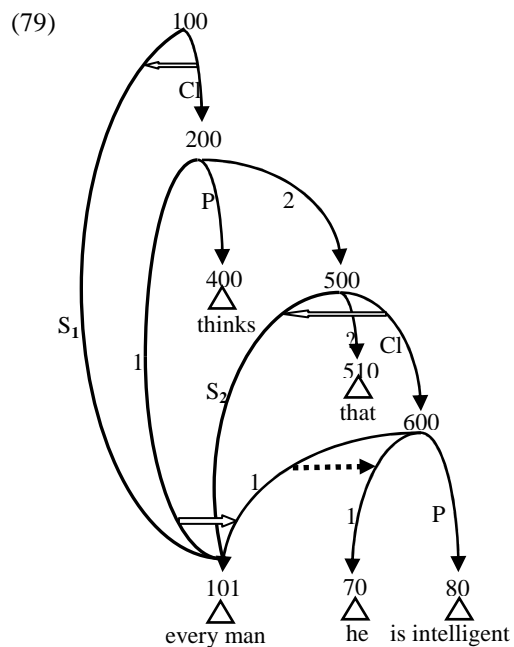
These two structures are incompatible with the No Distinct Scope-Arcs Overlap Law because each element heads two scope-arcs; therefore, the structures are excluded. The only[22] structures that are admitted for (71) are (81) and (82).

(81)

100 — Cl — 200 — P — 400 thinks — 2 — 500 — ? — Cl — 510 that — 600 — 1 — 101 every man — 70 he — 80 is intelligent — S₁ — 1 — P

(82)

100 — Cl — 200 — S₁ — 1 — 2 — 2 — P — 300 every man — 500 himself — 400 likes
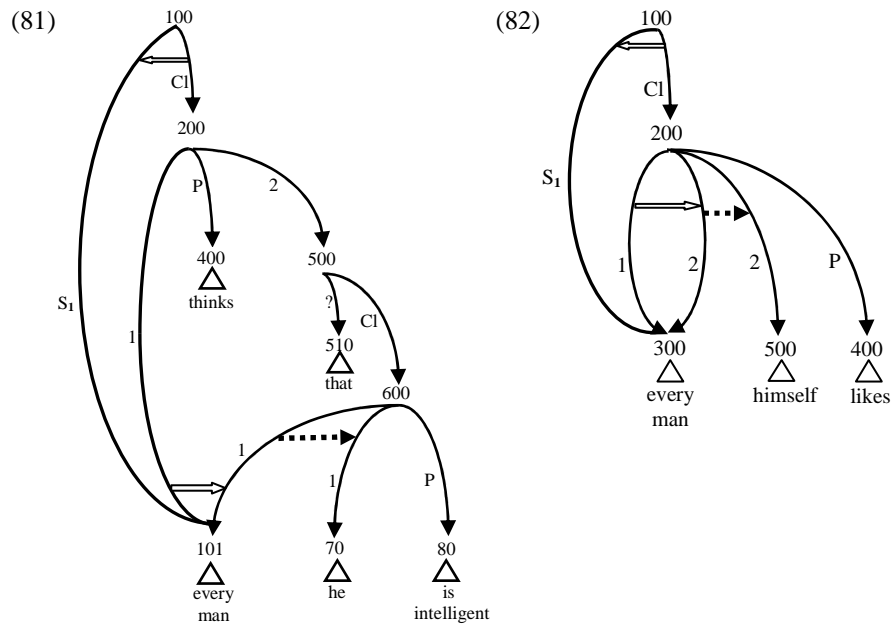
In each structure, the element that occurs in two positions only heads a single scope-arc, and therefore the structures are not ungrammatical according to the principle (77). This also captures the fact that the element has quantificational force with respect to a single constituent only. The proform, however, is interpreted without quantificational force, but as a bound variable[23]. The final issue that needs to be addressed is how the sentences in (72) are compatible with the No Distinct Scope-Arcs Overlapping Law. The answer is provided by the structures for the two sentences in (83) and (84).

---

[22] This statement is not fully correct. (72a) is also compatible with an unwanted structure, viz. one where the single scope-arc is present in the embedded clause, resulting in a structure where the higher occurrence of *every man* has to be treated as a bound variable (cf. next footnote, fn. 23). Such a structure is unwanted because bound variables must appear within the scope of the quantifier they belong to. This structure can be easily excluded by a law that requires arcs translated into bound variables to be arc-commanded by their overlapping scope-arcs.

[23] In order to guarantee this, the following translation mechanism is needed.
(i) *Translate any arc A into a bound variable to some quantifier headed by a scope-arc B if A and B kiss*
 Given the definition from chapter 5, *kiss* is a relation between two arcs that overlap and that are not neighbors. Since this relation is antireflexive, scope-arc B will not end up being interpreted as a bound variable itself.

(83)

(84)
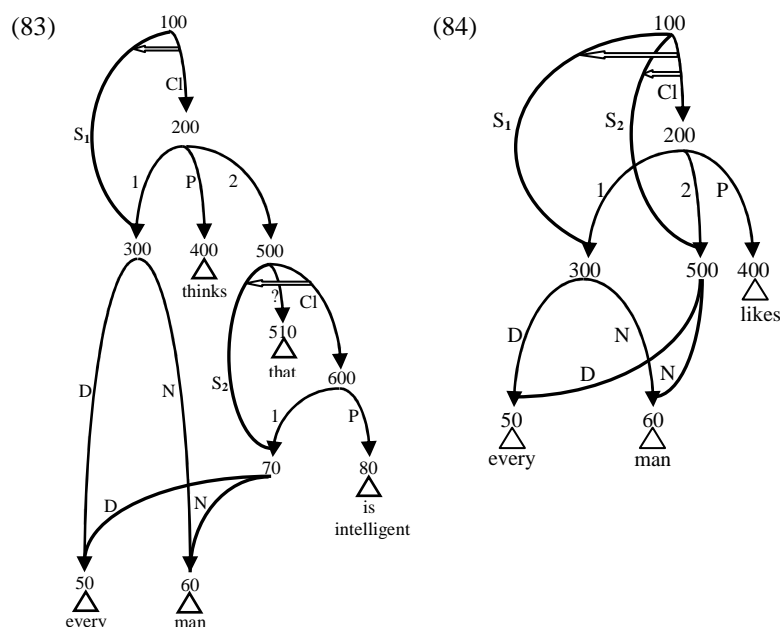
In these structures, there is no element that is both subject of the matrix clause, or subject and object of the same clause, but each relation is expressed by a distinct element that however happens to be composed of identical words. Since each element is therefore distinct from the other, each element can be headed by a separate scope-arc so that there can be distinct instances of quantificational force.

To conclude, I have shown that quantificational expressions anteceding a proform pose no problem for the APG treatment of proforms. More specifically, I have argued that, given the independently motivated property of scope assignment to quantificational elements, the structure for such sentences cannot contain a quantificational element that is assigned scope in both positions it occurs in. Rather, it is assigned only one scope because it only can be assigned one scope. To put it more succinctly: the structures that have been claimed to underly sentences with quantificational elements as antecedents do not underly such sentences.

7.2.5.3 Proxy Readings of Proforms

The third and final problem relates with what is called *proxy readings* of proforms, that is, readings where a proform bound by an antecedent is not interpreted identically to the antecedent but as a proxy of that antecedent. Such sentences were intensly discussed by Jackendoff 1992, an example from which is given in (85).

(85)   (Context: The other day I was strolling through the wax museum with Ringo
         Starr, and we came upon the statues of the Beatles and …)
         … all of a sudden Ringo fell on himself.

                                                      (Jackendoff 1992, ex. 13)

What is of importance is that (85) is ambiguous and can either rmean that Ringo undressed Ringo or that Ringo took off the clothes of the wax statue representing Ringo. This latter reading is called 'proxy reading' because the proform doesn't literally refer to the antecedent but to a proxy of it, in that case to the wax statue of Ringo. The problem proxy readings pose for the APG approach to proforms is clear. Given the APG perspective, a proform is nothing but the reflex of an erased instance of the antecedent that has associated with it a single meaning. Since what is semantically visible at the position where the proform appears is the antecedent, the meaning present at both positions must be the same, since the antecedent simply only has a single meaning. But as proxy readings show, this is not the case. The meaning of the antecedent at its distinct positions can differ, indicating that what is present at the position of a proform is not the antecedent of a proform but simply the proform itself, to which a meaning is assigned. Importantly, as the assignment function need not necessarily be one of identity (cf. Reuland & Winter 2009), interpretative differences between a proform and its antecedent can be captured, contrary to the APG-approach where only identity in the interpretation of an antecedent and its proform are expected.

Although I can't offer a full account of proxy readings, I give a general outline of what I consider a viable analysis. The basic idea of my analysis is that the premise in the foregoing discussion is wrong, viz. that the antecedent has associated with it a single meaning. Rather, what I would like to suggest is that lexical nouns – like *Ringo* or *book* – have associated with them (i) a basic meaning, and (ii) a range of meanings that are *predictable* on the basis of that basic meaning (cf. McCawley 1973b, p. 64, for a partly similar yet very different suggestion, which my sketchy analysis is based on). For example, the word *John* basically refers to a person, but since persons are part of the natural worls, every person has a body; in (86a), *John* refers to the person, but in (86b), it refers to the body.

(86)   a. John thinks that the world is flat.
        b. John weighs 80kg.

Similarly, as all persons participate in events, a person's name can also be used as proxy for his actions, as in (87) where *Ringo* can not only refer to the person Ringo, but also to his way of playing drums.

(87)   I like Keith Moon but I certainly don't like Ringo.

In a similar vern, as all persons can be depicted, the word *Ringo* can also refer to any kind of image of that person, like a wax statue (Jackendoff 1992, p. 2, gives many more examples to this effect). The relevance of this observation is that proxy readings are not a property of proforms. To the contrary, they are available already for every lexical noun. But then, the problem posed by proxy readings of proforms vanishes. Since proxy readings are not a property of proforms but already of NPs with a lexical noun, the problem of proxy readings for proforms vanishes. For the source of a proxy reading is not the proform but the underlying antecedent. Under this perspective, the structure for (85), shown in (88), where *himself* replaces *Ringo* as causes no trouble.

(88)
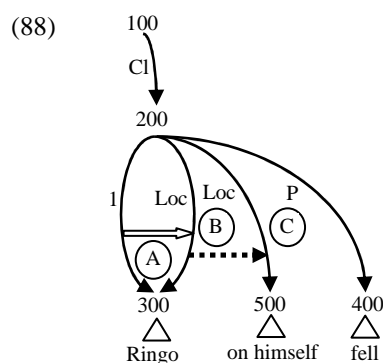
In (88), the occurrence of *Ringo* heading the 1-arc is interpreted as the person, whereas the the occurrence of *Ringo* heading the Loc-arc is interpreted as a proxy of Ringo. This is possible because both meanings are simultaneously specified internal to the lexical noun *Ringo*.

Although sketchy, this account has a number of benefits. First, coupled with the treatment of proforms bound by quantified expression in section 7.2.5.2, one expects proxy readings to be available even for proforms functioning as bound variables. This is so because the quantificational meaning is represented by an arc and not internal to the lexical noun heading this arc so that no interaction is expected. And as observed by Reuland & Winter 2009, this is in the fact the case.

(89)   All of a sudden, every pop icon started taking off the shirt he was wearing.

(Reuland & Winter 2009, ex. 9)

Second, as both meanings are represented simultaneously, one expects also the reverse interpretation for (85), that is, the interpretation where the proxy of Ringo falls on the real Ringo. And although the possibility of such an interpretation was denied by Jackendoff 1992, p. 5, Reuland and Winter point out that such readings are available.

(90)   *Consider a play where some actor plays a younger Ringo, and Ringo plays an older fan. It is no problem to interpret the sentence* Ringo stumbled and fell on top of himself *as true when the actor stumbled and fell on top of the real Ringo.*

(Reuland & Winter 2009, p. 73)

Third, given the simultaneous availability of the relevant readings, just like nothing forces one to interpret any occurrence as a proxy, nothing disallows one to interpret all occurrences as proxies either. Although such readings might not be common, they can be easily constructed. Consider a play with an actor playing Elvis Presley, a wax figure of Elvis Presley, and a scene where the actor has to very carefully inspect this figure. Then, it is perfectly fine to say:

(91)   Elvis hat sich gründlich inspiziert.
       Elvis has SELF carefully inspected
       Elvis inspected himself in a very careful way.

Crucially, in (91) neither *Elvis* nor *himself* refer to the real Elvis but only to proxies of the real Elvis.

In sum, what I attempted to show in this subsection is that proxy readings of proforms pose no challenge to the APG approach of proforms because proxy readings are not a feature of proforms but of lexical constituents. Consequently no problem arises if a proform is analyzed as a replacer for a lexical constituent because the proxy reading seemingly associated with the proform is in fact associated with the erased lexical constituent.

7.2.6   Summary

In this section, I have argued that the APG analysis of proforms allows a unified treatment of proforms, that is, whether or not they are used as markers of coreference, and of the phenomenon where coreference is marked via repetition of the antecedent. The first case follows because proforms are a reflex of the detachment of a grammatical relation from some element and nothing forces both grammatical relations to be initial relations of that element, whereas the second case is simply an overt instantiation of the structure underlying all proforms, viz. overlapping arcs, albeit in this case with reflexes in the S-Graph.

7.3   Benefits of the APG Treatment of Extraction

7.3.1   Introduction

The purpose of this section is to present corroborating evidence for the arc-based analysis of extraction, and more specifically for the employment of 30-arcs and relational markers. I show in section 3.2 how 30-arcs allow one to capture successive cyclicity effects and the nrelevant facts in one type of *wh in situ* languages, viz. in those that are island sensitive. In section 3.3, I demonstrate that relational markers allow a straightforward treatment of selective successive cyclicity effects (which I dub *VIP extractions*), wh-agreement effects, and complementizer alternations in extraction contexts (which two cases I dub *chameleon extractions*). Finally, in section 3.4, I present an extension of my APG analysis of extraction that is compatible with partial movement structures and the second type of *wh in situ* languages, viz. those that are not sensitive to islands.

7.3.2 The Benefits of 30-Arcs

7.3.2.1 Successive Cyclicity Effects

Before dealing with their theoretical reconstruction via 30-arcs, I briefly present three cases of what are called successive cyclicity effects in transformational terms. By this term, one refers to the observation that the extraction of an element A has syntactic effects at positions that correspond neither to the initial position of that element nor to its surface position. Such effects are generally interpreted as evidence that extraction of A creates constituency relations in positions intermediate between the initial position of A and its surface position. This extraction is called successive cyclic movement, and successive cyclicity effects are interpreted as reflexes of this kind of movement. The data I present illustrating successive cyclicity effects come from German, Icelandic, and French.
First, German requires embedded finite clauses lacking a complementizer to have the verb in first position, if that clause has been the target of extraction[24].

(92)   a. Wen glaubst du [$_S$ liebt sie t]?
            who believe you   loves she
      b.* Wen glaubst du [$_S$ sie liebt t]?
            who believe you   she loves
            Who do you think she loves?

This requirement even holds for those clauses that only lie between the gap and the surface position of the element targeted by extraction, as shown in (93).

(93)   a. Wen glaubst du [$_S$ meint er [$_S$ liebt sie t]]?
            who believe you   means he   loves she
      b.* Wen glaubst du [$_S$ er meint [$_S$ sie liebt t]?
            who believe you   he means she loves
            Who do you think he believes she loves?

This is remarkable because in non-extraction contexts, embedded finite clauses in German must not have the finite verb in first position. They either have an overt complementizer and the finite verb in last position (cf. 94a) or no overt complementizer and the finite verb in second position.

(94)   a. Ich glaube [$_S$ dass sie ihn liebt].
           I   believe   that she him loves
      b. Ich glaube [$_S$ sie liebt ihn].
           I   believe   she loves him

---

[24] Pankau et al 2010 provide evidence that such structures do in fact involve extraction and not the presence of a parenthetical expression *glaubst du* because these structures are compatible with elements normally incompatible with parenthetical expressions, for example negation and modal particles.

    c. Ich glaube [$_S$ ihn   liebt   sie].
        I   believe   him loves she
        I believe that she loves him.

What is absolutely impossible is to have the verb in first position.

(95)   a.* Ich glaube [$_S$ liebt   sie   ihn].
          I   believe   loves she him
       b.* Ich glaube [$_S$ liebt   ihn   sie].
          I   believe   loves him she
          I believe that she loves him.

One observes that extraction of an element influences the position of the finite verb, even in clauses which the extracted element neither originates in nor stops in (cf. (93)). Worrisome then is that the ungrammatical (95a) would be the underlying source for the grammatical (92a). This is worrisome for it requires a constraint permitting an otherwise ungrammatical structure just in case extraction targets this structure. This is problematic, not because it is a construction specific constraint, the relevant constraint must also state that a normally grammatical structure becomes ungrammatical if the structure is targeted by extraction; for otherwise the contrast between (92b) and (94b) would remain unaccounted for. This indicates that a deeper regularity is at play. Assuming successive cyclic movement, this regularity becomes visible; " t' " indicates the intermediate position of the extracted element.

(96)   a. Wen glaubst du [$_S$ t' liebt   sie t]?
          who believe you   loves she
       b.* Wen glaubst du [$_S$ t' sie liebt t]?
          who believe you   she loves
          Who do you think she loves?

The idea is that (96a) is just a regular embedded verb second clause similar to (94c), the difference being only that in the latter the first constituent is overtly expressed whereas in the former it is not. However, its former presence is sufficient to satisfy the general verb second requirement. Similarly, the ungrammaticality of the structure in (96b) is due to the fact that verb third clauses are generally barred in German, cf. (97).

(97)   a.* Ich glaube [$_S$ ihn   sie   liebt].
          I   believe   him she loves
       b.* Ich glaube [$_S$ sie   ihn   liebt].
          I   believe   she him loves
          I believe that she loves him.

Incidentally, these facts further show that the relevant constraints on German verb positioning must make reference to some more abstract structure because (92b) and (96b) are both out despite the fact that the finite verb occurs in final position, so that superficially nothing should block them. But the relevant constraint must make

reference to the underlying structure in which the verb does not occupy the final position.

Icelandic shows a pattern that is essentially similar to the German data. Icelandic requires the presence of the expletive *það* preverbally if and only if no other element occupies the preverbal position (cf. Zaenen 1983).

(98)   a. *(Það) var dansað í gær.
            EXPL was danced yesterday
      b. Í gær   (*það) var dansað.
         yesterday EXPL was danced
         They danced yesterday.
      c. *(Það) drekka margir vín á Íslandi.
           EXPL drink   many wine in Iceland
      d. Á Íslandi (*það) drekka margir vín.
         in Iceland EXPL drink   many wine
         Many people drink wine in Iceland.

                                 (Zaenen 1983, ex. 55-58)

Það is required independently of whether the clause is a main clause – as in the previous examples – or an embedded one, as in the following example.

(99)   a. Hann sagði [s að *(það) drekki margir vín á Íslandi].
          he   said   that EXPL drink many wine in Iceland
      b. Hann sagði [s að á Íslandi (*það) drekki margir vín].
         he   said   that in Iceland EXPL drink many   wine
         He said that many people drink wine in Iceland.

                                      (Zaenen 1983, ex. 59)

The presence of *það* is equally ungrammatical if the embedded clause is an embedded question and obligatorily hosts a fronted wh-phrase in preverbal position.

(100) a. Hann spurði [s hvar (*það) væri dansað t].
         he   asked   where EXPL was danced
         He asked where they danced.
      b. Hann spurði [s hvað (*það) drekki margir t á Íslandi].
         he   asked   what EXPL drink many   in Iceland
         He asked what many people drink in Iceland.

                                     (Zaenen 1983, ex. 60-63)

Unexpectedly though, the presence of *það* is prohibited in the following case involving topicalization.

(101) a. Vodka veit ég[s að er talið [s að drekki margir t á Íslandi]].
          vodka know I   that is said   that drink many   in Iceland
      b.* Vodka veit ég[s að það er talið [s að drekki margir t á Íslandi]].
          vodka know I   that EXPL is said   that drink many   in Iceland

    c.* Vodka veit   ég[$_S$ að það er talið[$_S$ að það drekki margir t á Íslandi]].
        vodka know I   that EXPL is said   that EXPL drink many   in Iceland
        I know that it is said that many people drink vodka in Iceland.

                                  (Zaenen 1983, ex. 64-65b)

This contrasts with the corresponding sentence without topicalization where the presence of *það* is obligatory.

(102) Ég veit [$_S$ að það er talið [$_S$ að það drekki margir vodka á Íslandi]].
      I   know that EXPL is said   that EXPL drink many   vodka in Iceland
      I know that it is said that many people drink vodka in Iceland.

                                   (Zaenen 1983, ex. 65c)

The contrast vanishes if extraction is assumed to target every intermediate preverbal position; then, the structure for (101a) would be the one in (103), " t' " marking again the intermediate position.

(103) Vodka veit   ég [$_S$ að   t' er talið [$_S$ að   t' drekki margir t á Íslandi]].
      vodka know I   that   is said   that   drink many   in Iceland
      I know that it is said that many people drink vodka in Iceland.

Assuming extraction to intermediate preverbal position, the extracted constituent counts for the constraint requiring some element in the preverbal position although it does not surface. However, parallel to German, what counts is that 'earlier' some element appeared there, rendering the presence of another element to fulfill this function impossible.
I finally turn to French. As described in Kayne & Pollock 1978, French has an optional rule, dubbed *stylistic inversion*, where subject and the predicate of some clause are permuted if the clause contains an extracted element.

(104) Quand partira   t ton ami?
      when   will.leave   your friend
      When will your friend leave?

                                 (Kayne & Pollock 1978, ex. 1a)

This extraction has to be overt.

(105)* Partira   ton ami   quand?
      will.leave your friend when
      When will your friend leave?

                                 (Kayne & Pollock 1978, ex. 7a)

That it is really extraction that triggers stylistic inversion and not the illocutionary force of the sentence is shown in (106).

(106)* Partira   ton   ami?
      will.leave your friend
      Will your friend leave?

                                           (Kayne & Pollock 1978, ex. 4a)

Significantly, stylistic inversion is possible in embedded clauses too.

(107) Je me demande [$_S$ quand partira   t ton   ami].
      I me wonder   when will.leave   your friend
      I wonder when your friend will leave.

                                           (Kayne & Pollock 1978, ex. 2a)

With this background, consider the following sentences.

(108) a. Qui a-t-elle   dit [$_S$ qu'avait vu   t Paul]?
           who has-?-she said   that'has seen Paul
           Who did she say that Paul had seen?

                                   (Kayne & Pollock 1978, ex. 13a)
      b. Qui a-t-elle   dit [$_S$ que pense Jean [$_S$ qu'avait vu t Paul]]?[25]
           who has-?-she said   that thinks Jean   that'has seen Paul
           Who did she say that Jean thinks that Paul had seen?

The data in (108) show that stylistic inversion targets not only the clause containing the extracted element but also all clauses between the surface position of the extracted element and its base position. This is unexpected if one adheres to the assumption that it is the presence of an extracted element within a clause that triggers stylistic inversion because the intervening clauses superficially do not contain an extracted element. However, if extraction proceeds through positions in the intervening clauses, the reordering found in these clauses is no longer mysterious: the rule responsible for stylistic inversion makes reference not only to the surface position of an extracted element but also to 'earlier' positions occupied by it. The structures for the sentences in (108) would consequently look like (109).

(109) a. Qui a-t-elle   dit [$_S$ t' qu'avait vu t Paul]?
           who has-?-she said   that'has seen Paul
           Who did she say that Paul had seen?
      b. Qui a-t-elle   dit [$_S$ t' que pense Jean [$_S$ t' qu'avait vu t Paul]]?
           who has-?-she said   that thinks Jean   that'has seen Paul
           Who did she say that Jean thinks that Paul had seen?

Since the extracted element was present at some point in the embedded clauses, stylistic inversion found in such cases can be uniformly described by a rule stating that any clause containing an extracted element shifts the subject of that clause to the right periphery of the clause, independent of whether or not the extracted element is superficially present.

---

[25] Examples (108b) and (109) were kindly provided by Caroline Féry (p.c., 2011/12/30).

I now show how these effects in German, Icelandic and French can be accounted for by making appeal to 30-arcs. A successful analysis of all these cases has to capture the similarity between clauses containing an overtly realized element in clause peripheral position and clauses containing an unrealized element in clause peripheral position that is connected to an extracted element. The present APG analysis of extraction accomplishes this because both types of clauses contain 30-arcs, and the rules regulating certain structural peculiarities are simply sensitive to the presence of 30-arcs, independent of whether or not they are erased.

As for French, the rule[26] responsible for stylistic inversion has to be stated in the following way.

(110)   *French Stylistic Inversion Rule*[27]
          If there is a constituent x in which the element heading the 1-arc follows the
          element heading the P-arc then x heads a Cl-arc B that is a neighbor of a 30- arc

This rule mentions a yet undefined predicate, viz. *Arc-Precede*, whose definition is provided in (111)[28].

(111)   Def.: *Arc-Precede*
          Arc-Precede (A,B) ↔ Surface Arc (A) ∧ Surface Arc (B) ∧ Neighbor (A,B)
          ∧ Head (a,A) < Head (b,B)

This definition specifies formally that elements are ordered according to the less-than relation holding between head nodes of neighboring arcs. The rule in (110) informally says that subjects follow their predicates if the Cl-arc defining the clause they are contained in is accompanied by a neighboring 30-arc. That this rule has the desired effect of inverting subject and predicate in all clauses between the original and the surface position of an element undergoing extraction can be seen by inspecting the structure for (108b), shown in (112).

---

[26] All the rules to follow are formulated in informal prose as this suffices for the purposes of this chapter.
[27] This rule specifies a necessary property for clauses in which the subject follows the predicate, and not the other way round, thereby accounting for its optionality.
[28] Adopted from Postal 1986, p. 21.

(112)
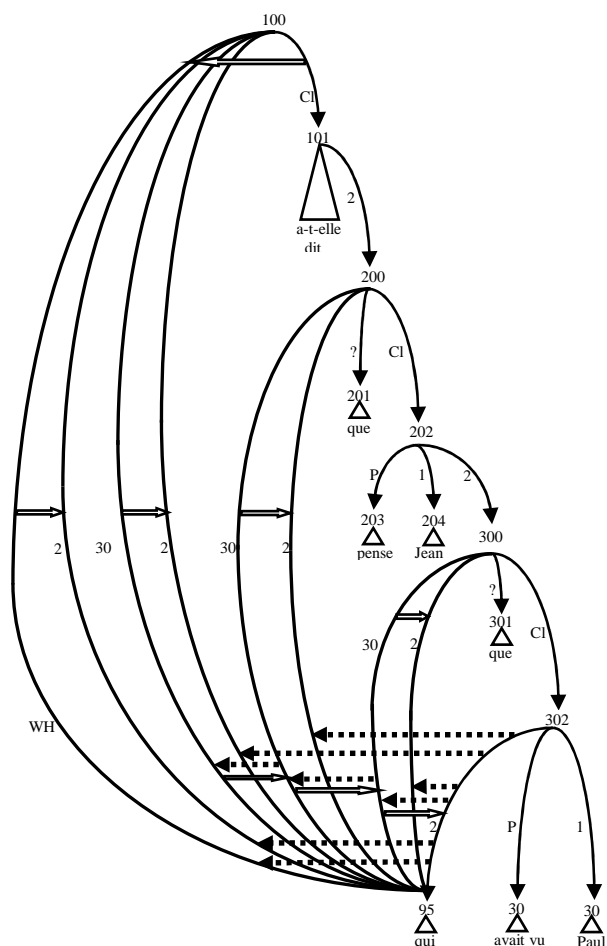
Of importance is that 30-arcs are present as neighbors of all Cl-arcs between a starter and a proper-overlay-arc arc, thereby correctly capturing that inversion not only targets the clause containing the overtly realized element, but also all intermediate clauses[29,30].

---

[29] This analysis is superior to the one given by Kayne & Pollock 1978, p. 595, according to which the subject moves to the right. The rule they give suggests that 'to the right' means 'to the right periphery of the sentence' (p. 599). This cannot be correct though. First, under such an analysis, if the matrix clause selects an embedded clause, then the subject is expected to show up *after* this embedded clause. But as their very examples show, this is not the case: the subject appears after the finite verb but *before* the embedded clause.

(i) [?]Avec qui   a   prétendu Marie [que sortirait   Jean t]?
    with whom   has   claimed Marie that leave.SUBJ Jean
    Who did Mary claim that John left with?

(Kayne & Pollock, 1978, ex. 28a)

In German and Icelandic, what is of importance for the grammaticality of the relevant examples is not so much the presence of a 30-arc itself, but rather that the 30-arc satisfies two more general requirements that are at work in both languages, viz. some requirement regulating the position of the finite verb such that it is either preceded by exactly one constituent (German) or by exactly two (Icelandic). In other words, what matters is the presence of some preceding element(s), and not the presence of a 30-arc, as in the case of French. That the presence of a 30-arc is not a necessary condition to satisfy the relevant requirements is suggested by the fact that in both languages elements can fulfill this function for which an analysis that treats them as extracted elements is not viable, viz. expletives.

(113) a. Es   hatten niemals viele die Aufgabe   erledigt.
           EXPL had   never   many the assignment finished
       b. Það höfðu aldrei margir lokið   verkefninu.
           EXPL had   never many   finished the.assignment
           It was never the case that many had finished the assignment.
                                                      (Thráinsson 2007, ex. 2.71)

The question is of course: how can the 30-arc satisfy the verb second requirement in intermediate clauses despite the fact that it is erased, and therefore should consequently be invisible? Or in other words: what is it that both unerased arcs and erased 30-arcs have in common such that the elements heading them can satisfy the verb second requirement? The answer is that: both types of arcs are *output* arcs.

(114) Def.: *Output Arc*
       Output Arc (A) $\leftrightarrow \neg\exists$B (L-Erase (B,A))

Both unerased arcs and erased 30-arcs are output arcs because the former ones are unerased, whereas the latter ones are erased, but *not* locally. The rule for Icelandic can therefore be formulated as follows.

This does not yet exclude the possibility that the subject *can* appear after the embedded clause, and that Kayne & Pollock simply didn't mention such examples. But as pointed to me by Caroline Féry (p.c., 2012/01/17), this option is out.

(ii) a. $^?$ Qui pense Marie [$_S$ qu'a   vu t Paul]?
             who thinks Marie   that'has seen Paul
     b. * Qui pense [$_S$ qu'a   vu t Paul] Marie?
             who thinks   that'has seen Paul Marie
             Who does Mary think that Paul has seen?

Secondly, if the matrix predicate contains an indirect object in addition to the extracted direct object, then the subject must not cross the indirect object (Caroline Féry, p.c., 2012/01/02).

(iii) a. * Qu'a   ecrit t à Paul Jean?
              what'has written to Paul Jean
      b. $^\sqrt{}$ Qu'a   ecrit Jean t à Paul?
              what'has written Jean   to Paul
              What did Jean write to Paul?

The correct analysis for such structures therefore seems to literally be inversion, viz. a reordering of subject and predicate, where predicate means 'the element heading the P-arc', and not what is also sometimes called a predicate, viz. the VP.

[30] I leave out here how to account for subject-clitic inversion in the main clause.

(115) *Icelandic Verb Rule*
       If the Cl-arc A defines a constituent in which the P-arc precedes all
       neighboring arcs, then there are exactly two output arcs B and C that are
       neighbors of A, and either B or C is headed by a complementizer.

Consider how this rule captures the contrast between the sentences in (116), whose
structures are provided in (117) and (118).

(116) a. Vodka veit   ég [s að er talið [s að drekki margir t á Íslandi]].
               vodka know I   that is said   that drink many   in Iceland
       b.* Vodka veit   ég [s að það er talið [s að það drekki margir t á Íslandi]].
               vodka know I   that EXPL is said   that EXPL drink many   in Iceland
           I know that it is said that many people drink vodka in Iceland.

(117)
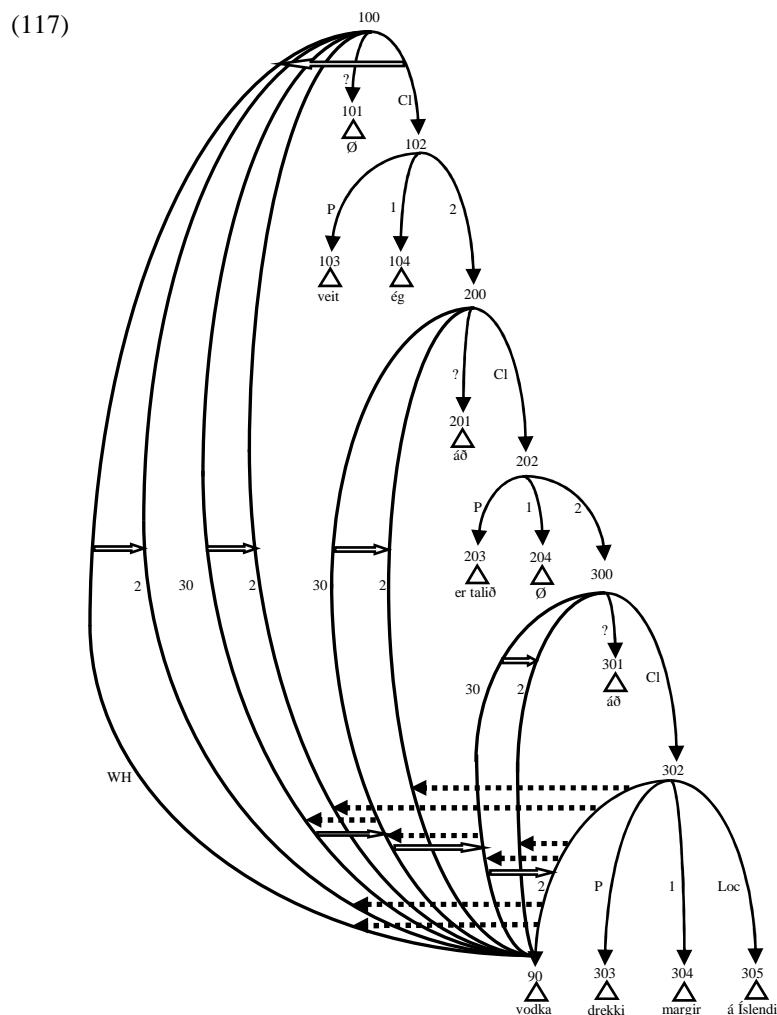
(118)
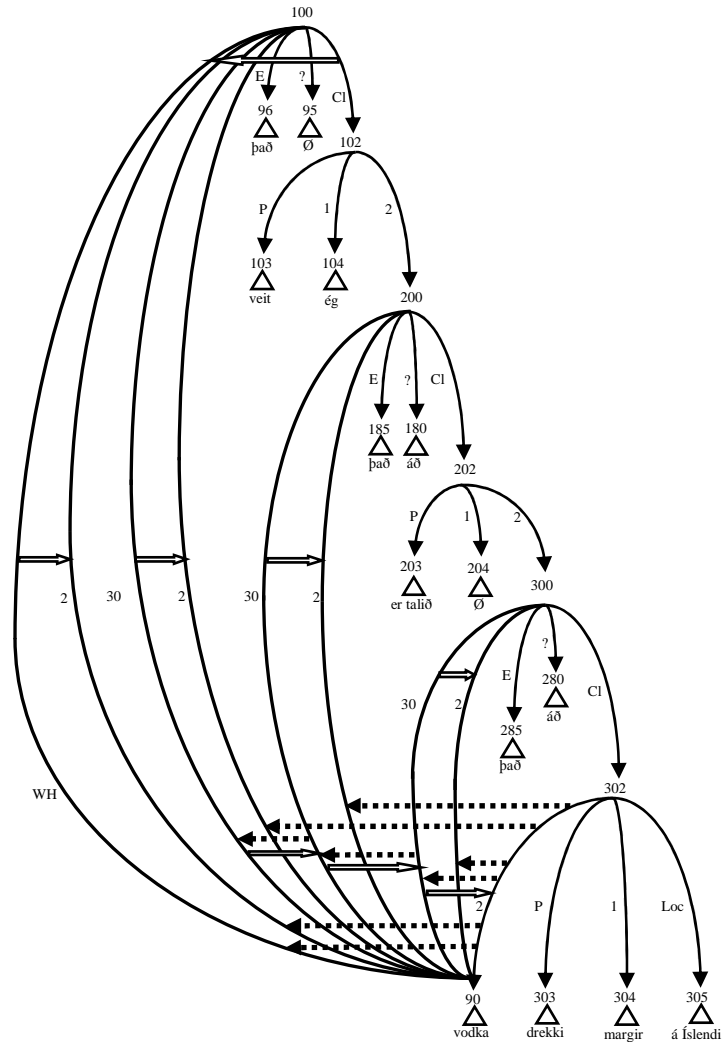
The structure in (117) satisfies the constraint in (115) because each embedded clause
has two output arcs as neighbors of the Cl-arc defining it, viz. the 30-arc and the arc
heading the complementizer *að*. In the structure in (118) on the other hand, the
constraint is not satisfied because there are three output arcs as neighbors of the Cl-
arc: in addition to the two arcs also found in (117) there is also an arc headed by the
expletive *það*, heading an arc that for convenience I labeled 'E', abbreviating
'expletive'. As only two output arcs are allowed by the rule, the structure is out.
For German, I suggest the following rule.

(119) *German Verb Rule*
       If the Cl-arc A defines a constituent in which the P-arc precedes all neighboring
       surface arcs, then there is exactly one output arc B that is a neighbor of A.

Consider again the basic contrast from German, whose respective structures are
provided in (121) and (122).

(120) a. Wen glaubst du [_S meint er [_S liebt sie t]]?
            who believe you   means he   loves she
       b.* Wen glaubst du [_S er meint [_S sie liebt t]?
            who believe you   he means   she loves
            Who do you think he believes she loves?

(121)
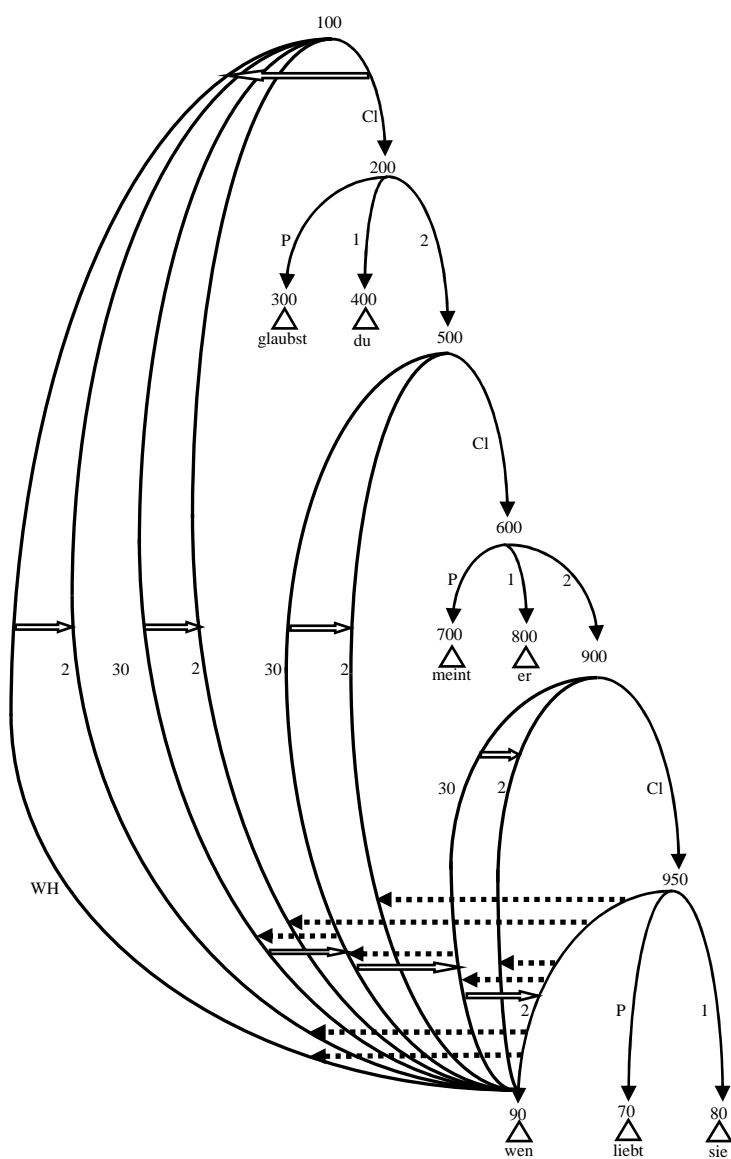
(122)
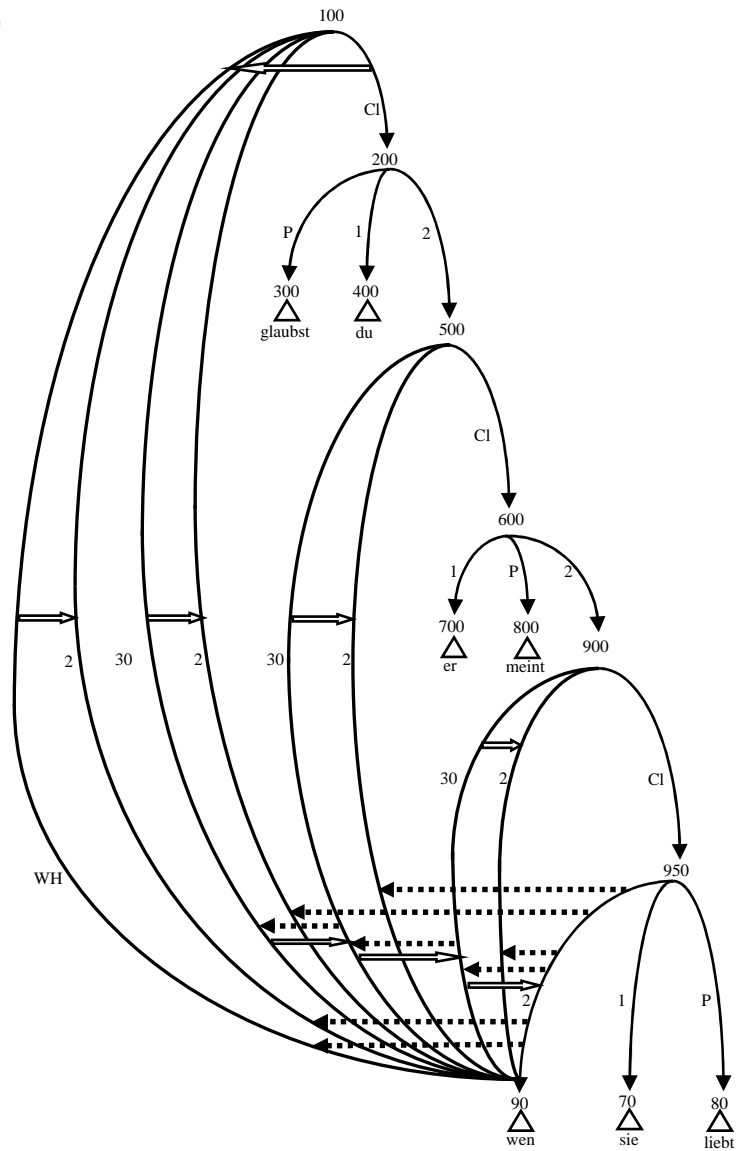
The structure in (121) is fine because there is exactly one output arc that is a neighbor of each Cl-arc, viz. the 30-arc. The structure in (122) on the other hand is out because in the constituent defined by each Cl-arc the predicate does not precede all surface arcs.

At the end of subsection 4 in section 6 of chapter 6, I said that the treatment of the resuming element as a replacer to a relational marker has another, seventh virtue, relating to the position of the finite verb in the clause featuring a resuming element. The finite verb in such clauses must not appear in second position.

(123) a. **Wen** glaubst du   [$_S$ <u>wen</u> sie t liebt]?
           who believe you   who she loves
       b.* **Wen** glaubst du   [$_S$ <u>wen</u> liebt   sie t]?
           who believe you   who loves she
           Who do you think she loves?

This is initially puzzling for any approach treating the resuming element as a spell-out of a copy of the extracted element created by successive cyclic movement. For then one expects the verb to appear in second position, similar to extractions where this copy is unrealized, cf. (124).

(124)   Wen glaubst du [$_S$ t' liebt sie t]?

But as a matter of fact, this option is ungrammatical. Furthermore, having the verb in final position leads to ungrammaticality in case the copy is unrealized, cf. (125).

(125)* Wen glaubst du [$_S$ t' sie liebt t]?

So in sum, the linearization properties of the finite verb in a clause containing a resuming element are exactly the opposite of the clauses where no resuming element is present. This difference is expected given the rule for German in (119). To see this, consider the structures for the sentences in (123), provided in (126) and (127), respectively.

(126)
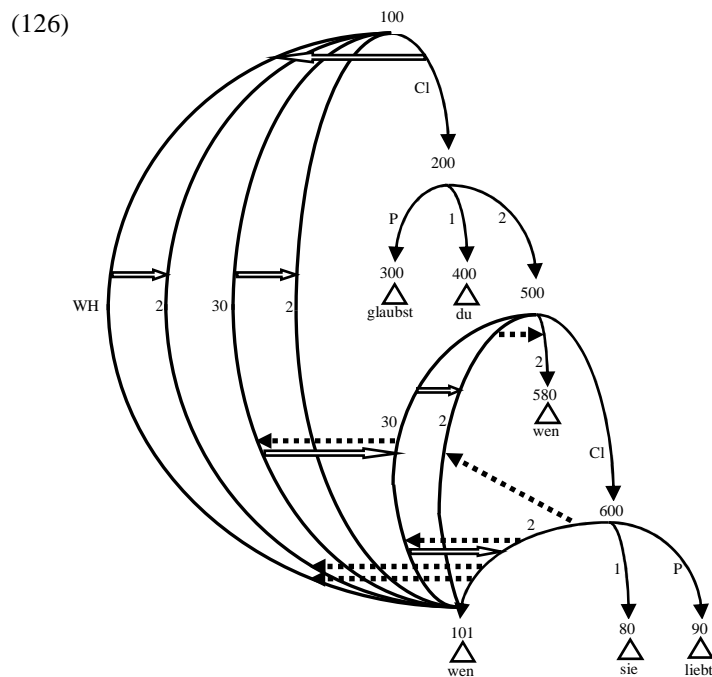
(127)
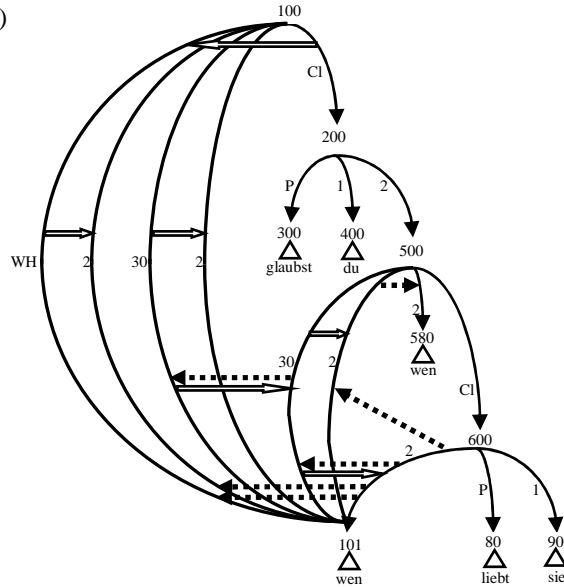
The reason why the structure in (127) is not well-formed is because although the P-arc precedes all surface arcs internal to the constituent defined by the Cl-arc, there are *two* output arcs neighboring that Cl-arc, viz. 30-arc and the replacer arc defining the resuming element. But the rule in (119) says that in such cases only one output arc must be present is a neighbor of the Cl-arc. Consequently, only the option of having the finite verb in final position remains, resulting in the grammaticality of the structure in (126). Finally, the reason why (124) is grammatical in contrast to that in (123b) is that (124) lacks the replacer arc defining the resuming element, therefore also a second output arc, so that it is compatible with the rule in (119).

7.3.2.2 Island Sensitive *in situ* Languages

I said in chapter 6 that laws only specify the Sponsor properties of 30-arcs. The relevant two laws specifying this are repeated in (128) and (129).

(128)   *The Starter Law*
         Starter (A,B) → ∃C (30-Arc (C) ∧ F-Successor (C,A))

(129)   *The 30 Arc Sponsor Law*
         30-Arc (A) ∧ ¬Initiator (A) → ∃B (30-Arc (B) ∧ Sponsor (B,A))

Not specified by any universal law are the Erase properties of 30-arcs. As I suggested, this aspect is taken care of by language specific statements. For example, German is subject to the following rule.

(130) *30-Arc = Successor-I Rule*
       30-Arc (A) → ∃B (F-Successor-I (A,B))

This rule specifies that 30-arcs erase their predecessors, resulting in extractions where some element undergoing extraction is overtly realized only at the top position, that is, at the position of the proper-overlay-arc arc. But nothing forces such a rule. Logically, two other options are possible. First, 30-arcs are unerased, and second, 30-arcs are erased by their predecessors. And in fact, both options are present in natural languages. The first option is discussed in chapter 8, where I argue that Afrikaans instantiates the option of unerased 30-arcs. So in the remainder of this section, I only discuss the second option, that is, that where 30-arcs are erased by their predecessors, as stated more formally in (131)

(131) *30-Arc = Successor-II Rule*
       30-Arc (A) → ∃B (F-Successor-II (A,B))

This rule is satisfied for example in the following structure with extraction of a subject out of a doubly embedded clause.

(132)
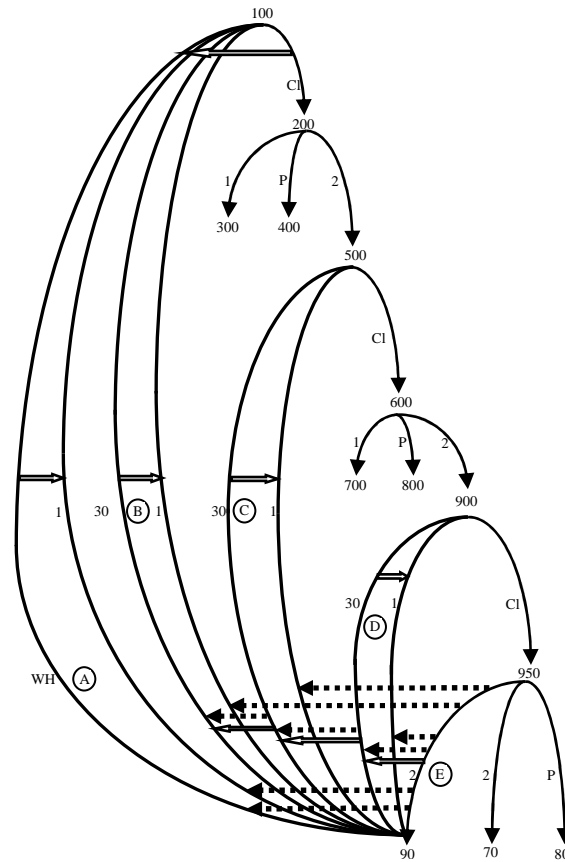
Of importance are the proper-overlay-arc arc A, the three 30-arcs B, C, and D, and the starter E. Proper-overlay-arcs are generally erased by their neighboring Cl-arc. Since also the rule in (131) is at work in (132), the 30-arcs are also erased, resulting in an extraction that leads to no reordering of the element targeted by extraction, that is, the element that is extracted is realized in the same position that it would occupy if had not undergone extraction. The distinction between languages where extraction has an effect on word order and languages where it doesn't is usually captured by distinguishing *(wh) in situ* from *(wh) ex situ* languages. I adopt this terminology only partially. In fact, two types of *in situ* languages need to be distinguished, only one of which instantiates the structure in (132). I call this *type 1 in situ* language. Despite the fact that extraction in *type 1 in situ* languages does not induce any word order effects, one expects that they are sensitive to the same constraints that are at work in *ex situ* languages, the most prominent of which is *island sensitivity*. Accordingly, *type 1 in situ* languages are expected to show the full range of island effects as these constrain extraction in general. And although rare, this type does in fact exist, viz. in Eastern Armenian and Persian[31] (Megerdoomian & Ganjavi 2000), Mong Leng (Bruhn 2007), Vietnamese (Bruening & Tran 2006), and Bellunese[32] (Munaro et al.

---

[31] Both Eastern Armenian and Persian provide independent evidence for the fact that extraction is present because *wh in situ* gives rise to weak crossover effects in both languages.

(i) a. *Ir_1 kuyr-e **$umin_1$** k'rak'ets?   [Eastern Armenian]
    his sister-NOM who.ACC shoot
    Who did his sister shoot?

  b. *$Madar-esh_1$ **ki_1-ro** dust dare?   [Persian]
    mother-his who-ACC like have
    Who does his mother like?

                         (Megerdoomian & Ganjavi 2000, ex. 13a & ex. 14a)

[32] Munaro et al. 2001 and Poletto & Pollock 2000 claim that wh-phrases in Bellunese do not appear *in situ*, but are overtly moved. This movement however is masked because it is followed by remnant movement of the whole clause. They provide support for this analysis with the following contrasts:

(i) a. Al ghe ha dat al libro a so fradel
    he to.him has given the book to his brother
    He gave the book to his brother.

  b. ?? Ghe halo dat al libro **a chi**?
    to.him has.he given the book to whom

  c. Ghe (lo) halo dat **a chi**, al libro?
    to.him it has.he given to whom, the book
    To whom has he given the book?

  d. *Ghe halo dat **che** a so fradel?
    to.him has.he given what to his brother

  e. Ghe halo dat **che**, a so fradel?
    to.him has.he given what to his brother
    What did he give to his brother?

                     (Munaro et al. 2001, ex. 26; Poletto & Pollock 2000, ex. 7)

According to the above mentioned authors, these data show that *in situ* object wh-phrases are not really *in situ* because they must precede right dislocated objects. It is however unclear why these examples show that the wh-phrase is not *in situ*; all they show is that right dislocated elements are not in their *in situ* position. The question is of course why a wh-phrase triggers obligatory right dislocation of its co-arguments, but it is completely orthogonal to the issue of whether the wh-phrase stays *in situ* or not. Granting that Bellunese has overt movement of the wh-phrases plus remnant movement of the clause, one still needs to account for the sentence final position of the wh-phrase's co-arguments. For they are expected to precede the wh-phrases because they are part of the remnant-moved clause. So even under the remnant movement analysis, one has to resort to an additional mechanism for the examples in (i).

2001; Poletto & Pollock 2000), illustrated in (133)-(137), respectively. The a-examples illustrate Complex NP islands, the b-examples Subject islands, and the c-examples Adjunct islands; the *in situ* wh-phrases are set in **bold**[33].

(133) a.* Ayn girk-en   es aRnelu [$_S$ vor **ov**   dasaran-um k'artats]?
        that book-ACC are buy.FUT   that who class-LOC   read
        Who are you going to read the book that read in class?
    b.* [$_{Subj}$Vor Vrej-e   **umin**   e mat'nel]   amboqj ent'anik-in husahat'ets?
        that Vrej-NOM who.ACC is denounced whole   family-DAT disappointed
        Who did that Vrej denounced disappoint the whole family?
    c.* Usutsich-e   bark'atsav [$_S$ vorovhet'ev GaRnik'-e   **vor**   **t'q-in**   er tzetzel]?
        teacher-NOM got.angry   because   Garnik-NOM which boy-ACC was beaten
        Which boy did the teacher got angry because Garnik had beaten?
                      (Megerdoomian & Ganjavi 2000, ex. 7a, ex. 8a, & ex. 9a)

(134) a.* Ali in   shaye' [$_S$ ke nader kilinton-o   **koja**   dide]-ro   shenide?
        Ali this rumor   that Nader Clinton-ACC where has.seen-ACC has.heard
        Where has Ali heard the rumor that Nader has seen Clinton?
    b.* [$_{Subj}$ Inke   **ki**   ba in   ma'sale ashena hast] xeyli jaleb-e?
        this.that who with this issue   familiar is   very   interesting-is
        Who is that is familiar with this issue interesting?
    c.* Ali [$_S$ ba'd az   inke   **ki**-o   busid] raft madrese?
        Ali   after from this.that who-ACC kissed went school
        Who did Ali go to school after kissing?
                      (Megerdoomian & Ganjavi 2000, ex. 7b, ex. 8b, & ex. 9b)

(135) a.* Lauj pum tug txivneej [$_S$ kws **leej twg** nyam]?
        Lao see CL man   REL who   likes
        Who did Lao see the man who likes?
    b.* [$_{Subj}$Qhov **leej twg** nyam koj] yog ghov zoo?
        that who   like you be CL   good
        Who is that you like good?
    c.* Nwg nyob nuav [$_S$ ruaqhov nwg nyam **dlaabtsi**]?
        he   live here   because he   like   what
        What does he live here because he likes?
                      (Bruhn 2007, ex. 51a, ex. 54a, ex. 52a)

(136) a.* Tan se chup hinh   con ho [$_S$ da doa **ai**]]?
        Tan ASP catch picture CL tiger   ASP scare who
        Who will Tan take a picture of the tiger that scared?
    b.* [$_{Subj}$ **Ai**   se   bodi] lam   moi nguoi boi roi?
        who ASP leave make everyone   embarrass
        Who will that leaves make everyone embarrassed?
    c.* Tan se   thua cuoc [$_S$ vi   **ai**   lam   hu   xe   cua   anh ta]?
        Tan ASP lose event   because who make damage vehicle belong he
        Tan will lose the race because who will damage his car?
                    (Bruening & Tran 2006, ex. 13a, ex. 14a, ex. 15a)

---

[33] That the wh-phrases are in situ can be deduced from the basic word order of the languages: both Eastern Armenian and Persian have SOV, whereas Mong Leng, Vietnamese, and Bellunese have SVO.

(137)   a.* Te à-li   dit che Piero l'à   comprà an libro [_S che parla de **che**]?[34]
               you have-SCL told that Piero SCL'has bought a   book   that speaks of what
               What have they told you that Piero bought a book that is about what?
        b.* Te à-li   dit che [_Subj i parenti de chi] no i-é   vegnesti?
               you have-SCL told that   the relatives of whom not SCL-have come
               Who have they told you that the parents of haven't come?
        c.* Ho-e   da telefonarte [_S inveze de'ndar **andé**]?
               have-SCL to phone.you   instead of going where
               Where do I have to phone you instead of going?

                                                        (Munaro et al. 2001, ex. 24 & 25b)

The simplified structure for example (137c) is given in (138).
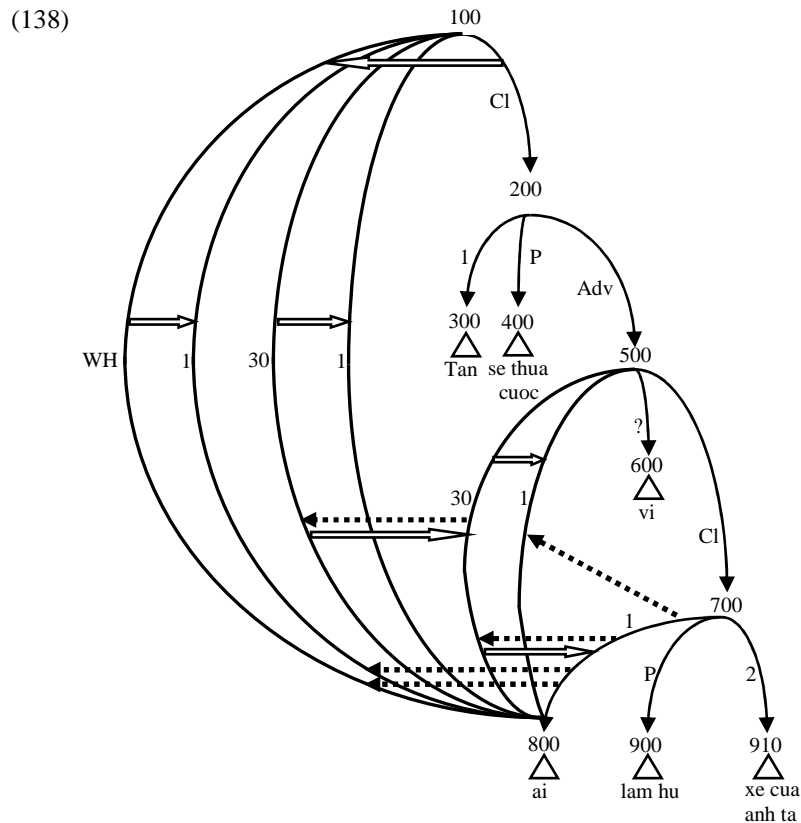
In order to account for the fact that *type 1 in situ* languages are island sensitive, an analysis for island sensitivity is needed of course. Although beyond the scope of this work, I briefly sketch one possible APG-account. This account is characterized by a special type of arc, called *Island Arc*. Island arcs are generally POS-arcs, cf. (139)

---

[34] SCL = subject clitic

(139) Def.: *Island Arc*
      Island Arc (A) ↔ POS-Arc (A)

This definition is very broad, marking basically every constituent an island. Since in most languages islands are a subset of constituents, I assume that the real set of islands is specified by language particular statements, that is, by rules. For example, the rule for Vietnamese based on the data in () looks as follows.

(140) *Vietnamese Island Rule*
      Island Arc (A) → POS-Arc (A) ∧ ∀B (Support (B,A) → (MOD-Arc ∨ 1-Arc ∨ Oblique-Arc))

This rule restricts the set of island arcs to those that are branches of Mod-arcs (thereby capturing complex NP-islands), or 1-arcs (thereby capturing subject islands), or oblique-arcs (thereby capturing adjunct islands). This is certainly not a satisfactory account for islands, but it suffices for the purpose under discussion[35]. In order to account for the ungrammaticality of extractions out of islands, I propose the following law.

(141) *The Island Law[36] (First Version[37])*
      Starter (A,B) ∧ Island Arc (C) ∧ Arc-Command (B,C) ∧ Arc-Command (C,A) → Neighbor (B,C)

This law basically requires the domain between starter and proper-overlay-arc to not contain an island arc, but is consistent with the fact that extraction can occur internal to an island. The law accounts for the ungrammaticality of (): there is an island arc, viz. the Cl-arc whose supporter is the Adv-arc, that is arc-commanded by the proper-overlay-arc B and that arc-commands itself the starter A, but the proper-overlay-arc B and the island arc C are not neighbors. *Type 1 in situ* languages obviously contrast with *type 2 in situ* languages such as Bahasa Indonesian and Malay where the extracted element shows *no* island effects, that is, it behaves as if it never underwent extraction in the first place. This difference and the question of how to handle it are the topic of subsection 4 of this section.

---

[35] What makes this account particularly unsatisfactory is that it fails to determine the principles regulating which relations constitute islands under which conditions, in case there are any. What makes this account interesting though is it flexibility. For there is variation concerning (i) what relation constitutes an island in the first place (for example, the Scandinavian languages are less restrictive compared to English or German, cf. Engdahl & Ejerhed 1982) and (ii) whether a constituent x is an island under all conditions, as the discussion surrounding strong and weak islands has made sufficiently clear (cf. Cinque 1990; Postal 1998; Szabolcsi 2006).

[36] This law is at first sight incompatible with extractions out id islands rescued by the insertion of a proform at the gap site (cf. Ross 1986). However, such cases can be excluded as islands by rules restricting islands to those constituents where starters – if present – lack neighboring replacer arcs.

[37] The Island Law is reformulated in subsection 4 of this section to capture island sensitivity of partial movement structures.

7.3.3   The Benefits of Relational Markers

In the previous subsection, I have shown how successive cyclicity effects can be analyzed with the help of 30-arcs. What I would like to show now is that 30-arcs alone are insufficient to deal with all effects an extracted element can trigger in intermediate position and that relational markers are needed in addition to 30-arcs. For there are patterns of extraction where the effect of an extracted element depends on the relation the element bore prior to extraction, and there are patterns of extraction where the effect of an extracted element depends on the context in which it appears. I call the first pattern *VIP extractions* and the second one *chameleon extractions*. Both patterns receive a straightforward treatment with relational markers because each pattern corresponds to one of the two ways relational markers conserve the path taken by an extracted element. In chapter 6 I argued that a relational marker either conserves the relation the extracted element bore prior to extraction, or that it conserves the status of the elements hosting the starter. As I argue below, VIP extractions are an effect of the first option, whereas chameleon extractions are an effect of the second option.

7.3.3.1   VIP Extractions

VIP extractions are extractions where the effect of an extracted element in intermediate position depends on the relation this element prior to extraction, that is, on the relation of the starter. More specifically, only a subset of extracted elements triggers any effect, viz. only those that bore a special relation. Such a pattern of extraction is present in Spanish where it affects subject-predicate inversion and in Yoruba where it affects verbal morphology.
Spanish has a rule similar to that in French that inverts subject and predicate in the presence of an extracted wh-phrase, as shown in Torrego 1984.

(142)   a.   Qué   querían   t esos   dos?
               what wanted   those two
         b.* Qué   esos   dos   querían t?
               what those two   wanted
               What did those two want?

                                                                            (Torrego 1984, ex. 2)

Parallel to the French case, this rule inverts subject and verb not only in the clause containing the extracted element, but also in all clauses lying between the clause containing the extracted element and the clause in which it originated.

(143)   a.   Qué   pensaba Juan [s que le   había dicho Pedro [s que había publicado t la   revista]]?
               what thought Juan   that him had told Pedro   that had published   the journal
         b. *Qué   pensaba Juan [s que Pedro le   había dicho [s que la revista había publicado t]]?
               what thought Juan   that Pedro him had told   that the journal had   published
               What did John think that Peter had told him that the journal had published?

                                                                  (Torrego 1984, ex. 19b & ex. 19c)

However, this inversion is not possible when the wh-phrase is an adverbial element.

(144) a. En qué medida la constitución ha contribuido a eso t?
         in what manner the constitution has contributed to that
         In what way has the constitution contributed to that?
      b. Por qué Juan quiere salir t antes que los demás?
         why   Juan wants leave before that the others
         Why does Juan want to leave before the others?
      c. Cuándo Juan consiguió por fin abrir la puerta t ayer?
         when   Juan managed finally open the door   yesterday
         When did Juan finally get to open the door yesterday?
      d. Cómo Juan ha conseguido t meter allí   a su hijo?
         how   Juan has managed   put   there at his soon
         How has Juan managed to get his son in there?

                                                    (Torrego 1984, ex. 15)

Importantly, inversion is also barred in all clauses passed through by an adverbial wh-phrase.

(145) En qué medida Juan había pensado [s que Pedro le   había asegurado
      in what manner Juan had   thought   that Pedro him had   assured
      [s que la revista se   arriesgaría a publicar eso t]]?
        that the journal SELF risk   at publish that
      To what extent had Juan thought that Pedro assured him that the journal would risk publishing that?

                                                    (Torrego 1984, ex. 23)

So what one observes is that subject-predicate inversion is only triggered when some non-adverbial is extracted.

Turning to Yoruba as described in Carstens 1985, Sonaiya 1986, one observes that an extracted element whose original relation is that of 'location' requires the presence of a special particle *ti* dubbed preverb (abbreviated as 'PV') in Sonaiya 1986, cf. (146a); the preverb is possible only in the case of extraction (146b) [38].

(146) a. Níbo ni Àjíké **ti** ´n ta isu   t?
         where FOC Ajike PV ASP sell yams
         Where is Ajike selling yams?
      b.* Mo **ti** kàwé ní UCLA
         I   PV study at UCLA
         I study at UCLA.

                                                    (Carstens 1985, ex. 6 & ex. 12a)

As Carstens points out, in case of extraction out of an embedded clause, the preverb occurs in all intervening clauses.

---

[38] I restrict myself to the single case of locational adverbials. For the discussion on the behavior of other adverbials and other forms of the preverb, cf. the references given in the main text.

(147) Níbo ni o **ti** gbó [_S pé Rèmí **ti** rí Àjíké t]?
      where FOC you PV hear   that Remi PV see Ajike
      Where did you hear that Remi saw Ajike?

                                                         (Carstens 1985, ex. 39)

The important point is that (147) has a reading in which the questioned location is the one where Remi saw Ajike[39]. The appearance of the preverb in the embedded clause shows that the extracted element can influence the verb morphology in a clause different from the one it surfaces in. For the *in situ* position of the locational adverbial is not sufficient to trigger the presence of the preverb, as shown in (146b). Capturing VIP extractions with 30-arcs only is impossible because then one would fail to distinguish those extracted elements that do affect subject-predicate order or verbal morphology from those that don't. Relational markers however provide the relevant means to capture VIP extractions. All that is needed are the rules in (148) and (149) for Spanish and Yoruba[40], respectively.

(148) *Spanish Inversion Rule*
      If there is a relational marker A whose label belongs to the set of object R-signs then every Cl-arc B that is a neighbor of A defines a constituent where the P-arc precedes every neighboring 1-arc

(149) *Yoruba Preverb Rule*
      If there is relational marker A whose label belongs to the set of adverbial R-signs then every Cl-arc B that is a neighbor of A defines a constituent where the P-arc is headed by a preverb

The effect of the rule in (148) is that subject-predicate inversion is only permitted when a non-adverbial is extracted, since reference is made to the relational marker accompanying an overlay-arc, thereby accounting for the difference between (143b)

---

[39] Sonaiya 1986, p. 115, claims that this sentence has also another reading which she claims is preferred, viz. one in which the adverbial belongs to the matrix clause. I suspect that this at best reflects simply variation internal to Yoruba (a language with more than 30 million speakers) because I see no reason to trust the judgments reported by Carstens less than those given by Sonaiya. However, it might also be the case that Sonaiya's informants were judging sentences that they actually consider ungrammatical. For incidentally, Sonaiya reports (p. 124, fn. 6) that her speakers show "a general dislike of more than one preverb" and consider the appearance of more than one preverb "an unnecessary repetition" (op.cit.). This reminds me strongly of the situation found in German where many speakers do not accept wh-copying. When asked for judgments on wh-copying, such speakers either point out that one of the two wh-words is superfluous (for a similar report for speakers of Passamaquoddy, cf. Bruening 2006, p. 37) or attempt to connect the wh-phrase to a position in the matrix clause, for example by pointing out that the wrong case was chosen in an example like (i).
(i) **Wen** glaubst du   wen sie liebt?
    who think   you who she loves
    Who do you think she loves?
The correct case according to such speakers is the dative case which is the one required by the matrix predicate *glauben.*
[40] The rule for Yoruba as well as the majority of rules to follow are given in informal terms because they all involve notion that at this point I have no idea how to formally capture, for example the notion 'being accompanied by a preverb'.

and (145). And the effect of the rule for Yoruba is to permit special morphology only if the 30-arc has an accompanying relational marker whose label belongs to set of adverbial R-signs. Now, a relational marker is assigned its label either uniformly by the starter or not. Given the observation that inversion and the presence of preverb are observed in every clause that the extracted element passed through (as shown in (143a) for Spanish and in (147) for Yoruba), relational markers in both Spanish and Yoruba uniformly receive the label of the starter. In other words, they are subject to the same rule as German, which is repeated in (150).

(150) *Starter = Creator Rule*
       Rel-Marker $(A,B) \wedge$ Creator $(C,A) \rightarrow \forall D$ (Sponsor $(D,B) \rightarrow$ Overlap $C,D))$

Consider the structures for (143a) and (147) and in (151) and (152), respectively.

(151)
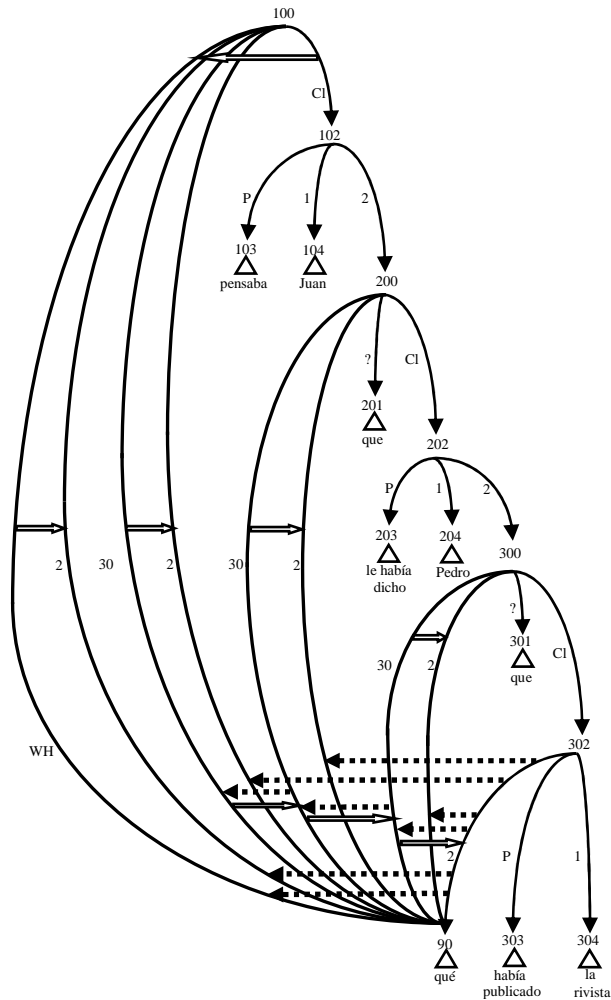
(152)
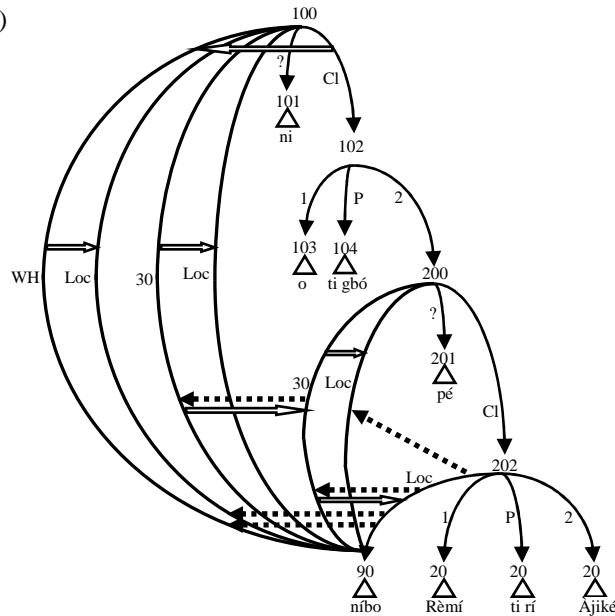
Given the rule in (150), it is always the starter that sponsors all relational markers (151) and (152). Since all relational markers therefore have the same label in all clauses, every clause feature the effect required by the rules in (148) and (149), viz. inversion in Spanish, and the presence of a preverb in Yoruba.

7.3.3.2   Chameleon Extractions I: Wh-Agreement

Chameleon extractions are a type of extraction where the effect of an extracted element in intermediate position depends on the context the extracted element appears in. More specifically, an extracted element behaves as an extracted element of type A in one clause, but as an extracted element of type B in another clause. The first type of chameleon extraction I discuss involves wh-agreement effects found in Chamorro, Palauan, and Malay. By wh-agreement, one refers to the observation that the presence of an extracted element alters verb agreement, but in ways differing from the one found in Yoruba.
Starting with Chamorro[41] (Chung 1982, Chung 1998, Chung & Georgopoulos 1988), extraction triggers special verb agreement. Instead of the expected subject verb

---

[41] Chamorro is a VSO language; the following abbreviations are used in the glosses: AGR = subject verb agreement; FUT = future tense; N = nominalization; OBL = oblique case; UMC = unmarked case; WAGRD = wh-agreement with direct object; WAGRO = wh-agreement with oblique; WAGRS = wh-agreement with subject. Some of the relevant morphemes surface as infixes, for example, *fa'gasi* (to wash) surfaces as *fuma'gasi*, with *um* being the morpheme indicating wh-agreement with subject. In the glosses, I will indicate the infixation process by repeating the verb in parentheses in front of the gloss for the infix.

agreement, agreement with the extracted element is present[42]. Consider the following examples.

(153) a. **Ha**-fa'gasi si   Henry i   kareta ni   häpbun.
       AGR-wash UMC Henry the car   OBL soap
       Henry washed the car with soap.
   b. Hayi f-**um**-a'gasi   t i   kareta ni   häpbun?
      who (wash)-WAGRS-wash   the car   OBL soap
      Who washed the car with soap?
   c. Hafa   f-**in**-a'gase-**n**-ña   si   Henry t ni   häpbun?
      what   (wash)-WAGRD-wash-N-his UMC Henry   OBL soap
      What did Henry wash with soap?
   d. Hafa **Ø**-fa'gase-**n**-ña   si   Henry ni   kareta t?
      what wash-N-his.(WAGRO)[43] UMC Henry OBL car
      What did Henry wash the car with?

                                    (Chung & Georgopoulos 1988, ex. 1-4)

(153a) is a normal declarative clause and the verb shows regular subject verb agreement morphology. In (153b), the subject is extracted and the verbal morphology manifests the affix *um* instead of the affix *ha*. If however an object is extracted, the verb is optionally nominalised and the affix *in* appears instead of the expected affix *ha*, as in (153c). Finally, (153d) shows that if an oblique is extracted, the nominalization of the verb becomes obligatory and no agreement affix can appear (neither *ha* nor *um* nor *in*). The effects are summarized in table 1.

status of extracted element	wh-agreement
subject	affix *um*
direct object	affix *in* & optional nominalization of the verb
oblique	no affix & obligatory nominalization of the verb

Table 1: Wh-agreement in Chamorro in the context of intraclausal extraction

Turning to wh-agreement when the extracted element originates in an embedded clause, one observes that the extracted element behaves differently in the matrix clause[44] than it does in the embedded clause. For example, if an oblique is extracted out of an embedded subject clause, then, as expected, the verb of the embedded subject clause shows wh-agreement typical of obliques. However, the verb of the matrix clause shows wh-agreement typical for *extracted subjects*. In other words, the extracted oblique behaves like an extracted oblique in the embedded clause, but like an extracted subject in the matrix clause. This is illustrated in (154).

---

[42] This effect however is restricted to clauses with realis mood (Chung 1982, p. 49).
[43] Although no actual morpheme indicating wh-agreement with an oblique is present, the combination of nominalization and the absence of any affix indicates the very same thing, hence the gloss.
[44] But only if the extracted element triggers any effect at all in the higher clause, because wh-agreement on predicates of higher clauses is facultative (Chung 1998, p. 248).

(154) a. **Ha**-istotba yu' [_S na   malägu' i   lahi-hu kareta].
AGR-disturb me   that want   the son-my car
That my son wants a car disturbs me.

b. Hafa **um**-istotba   hao [_S ni   **Ø**-malago'-**Ø**-ña   i   lahi-mu t]?
what WAGRS-disturb you   that want-N-his.(WAGRO) the   son-your
What does it disturb you that your son wants?

(Chung & Georgopoulos 1988, ex. 15a & ex. 16a)

Similarly, if an oblique is extracted out of an embedded object clause, then the verb of the embedded object clause shows wh-agreement with the oblique, whereas the matrix verb shows wh-agreement typical for *extracted objects*. Again, the extracted oblique behaves like an extracted oblique in the lower clause, but like an extracted direct object in the matrix clause, cf. (155).

(155) a. **Ha**-sangani yu' i   chi'lu-hu [_S na   malägu' gui kareta].
AGR-tell   me the sister-my   that want   she car
My sister told me that she wants a car.

b. Hafa s-**in**-angane-**n**-ña   i   chi'lu-mu [_S **Ø**-malago'-**Ø**-ña   t]?
what (tell)-WAGRD-tell-N-her the sister-you   want-N-her.(WAGRO)
What did your sister tell you that she wants?

(Chung & Georgopoulos 1988, ex. 15b & ex. 16b)

Unsurprisingly, if an oblique is extracted from another oblique, both verbs show wh-agreement for obliques, as the examples in (156) show.

(156) a. **Man**-duda siha [_S na   malägu' si   Maria kareta].
AGR-doubt they   that want   UMC Maria car
They doubt that Maria wants a car.

b. Hafa **Ø**-duda-**n**-ñiha   [_S ni   **Ø**-malago'-**Ø**-ña   si   Maria t]?
what doubt-N-their.(WAGRO) that want-N-her.(WAGRO) UMC Maria
What do they doubt that Maria wants?

(Chung & Georgopoulos 1988, ex. 15c & ex. 16c)

I should mention that this non-uniform behavior is not restricted to extracted obliques, extracted subjects trigger the same effect.

(157) a. Si   Juan ha-sangani yu' [_S na   **un**-bisita si   Rita].
UMC Juan AGR-say   me   that AGR-visit UMC Rita
Juan told me that you visited Rita.

b. Hayi si   Juan ha-sangani hao [_S b-**um**-isita   t si   Rita]?
who UMC Juan AGR-say   you   WAGRS-visit   UMC Rita
Who did Juan tell you visited Rita?

(Chung 1982, ex. 46b & ex. 45b)

In (157b), a subject is extracted out of an embedded object clause. Internal to the embedded object clause, the extracted subject behaves like an extracted subject. In the higher clause, however, the verb shows wh-agreement for an extracted direct

object, that is, the extracted subject behaves like an extracted direct object (although this agreement is masked in this case, cf. Chung 1982, fn. 7 & p. 56 for details). In addition, extracted direct objects show a non-uniform behavior, too.

(158) a. Ma'a'ñao si   Manuel [_S pära u-latatdi   i   famagu'un].
            fear   UMC Manuel   FUT AGR-scold the children
            Manuel is afraid to scold the children.
      b. Hayi Ø-ma'a'ñao-Ø-ña   si   Manuel [_S pära u-latatdi   t]?
            who fear-N-his.(WAGRO) UMC Manuel   FUT AGR-scold
            Who is Manuel afraid to scold?

                                                  (Chung 1982, ex. 46d & ex. 45d)

The predicate *fear* takes an embedded oblique clause as its second argument (cf. Chung 1982, p. 58). If extraction targets a direct object inside this embedded oblique clause, the verb of this clause usually reflects the original direct object status of that element. In this case though, the embedded clause shows no difference in verbal morphology because wh-agreement is restricted to clauses with realis mood, future being irrealis. More important is what happens in the matrix clause. For there, the extracted direct object behaves like an extracted oblique which is reflected by the obligatory absence of the infix *in*.
The generalization uniting all these cases is given in (159).

(159)   *Wh-agreement in higher clauses is determined by the grammatical relation of the constituent that <u>hosted</u> the extracted element prior to extraction to the next clause.*
                                                            (Chung 1982, p. 55)

Turning to (158b), that the matrix clause verb shows wh-agreement typical for obliques is due to the fact that an oblique clause hosted the extracted element. Similarly, that the extracted subject in (157b) triggers wh-agreement typical for objects is due to the object status of the clause hosting the extracted element prior to extraction to the higher clause. It can be easily verified that all other cases are captured by this generalization as well.
Wh-agreement effects similar to Chamorro are also observed in Palauan (Chung & Georgopoulos 1988; Georgopoulos 1985, 1991). In Palauan, a verb can either appear in realis or irrealis mood[45].

(160) a. **Ak**-me-sa   a kekeriei el box
            1.SG.S.R-VM-see ? small   L box
            I see the small box.

---

[45] Palauan is a VOS language; the following abbreviations are used in the glosses: IR = irrealis mood; L = linker morpheme; O = object; P = preposition; PF = perfective; R = realis mood; S = subject; VM = verb marker; the morpheme glossed '?' is a marker whose function is unclear and that appears in front of NPs and nominalised clauses, but not in front of pronouns or NPs introduced by demonstratives (cf. Georgopoulos 1991, pp. 31-2). It should also be mentioned that wh-agreement is overridden if the clause is introduced by the complementizer *el kmo* instead of *el* since *el kmo* requires realis mood (Chung & Georgopoulos 1988, pp. 261-2)

      b. Ngdiak **ku**-sa   a kakerous
          not   1.SG.S.IR-see ? difference
          I don't see the difference.

                                          (Chung & Georgopoulos 1988, ex. 8)

In (160a) the verb carries the prefix *ak* indicating both first person and realis mood. In (160b), the sentence is in irrealis mood and since agreement and mood markers on the verb are fused in Palauan, the verb has to bear a different agreement morpheme, viz. *ku*, indicating first person and irrealis mood (the absence of the verb marker in (160b) is due to the restriction that it can only cooccur with realis mood, cf. Georgopoulos 1991, p. 25). Although the mood of the clause is usually determined on semantic grounds in Palauan, there is one context where the relevant mood markers are determined on purely structural grounds, viz. in extraction constructions. Consider the examples in (161).

(161) a. Ngte'a a **Ø**-kileld-ii   a sub t?
          who   ? R.PF.heat-3.SG.O ? soup
          Who heated up the soup?
      b. Ngte'a a **l**-ulekod-ir   t a rubak?
          who   ? 3.S.IR-PF.kill-3.SG.O   ? old.man
          Who did the old man kill?
      c. Ngngera a **le**-silseb-ii   t a se'el-il?
          what   ? 3.S.IR-PF.burn-3.SG.O   ? friend-3.SG
          What did his friend burn?

                                (Georgopoulos 1991, p. 88, ex. 48)

In (161a), the verb bears no subject agreement marker but only a realis mood marker; in (161b) and (161c), the verb bears a subject agreement marker that additionally indicates irrealis mood. All these sentences however are interpreted as semantically realis. As Georgopoulos 1985, p. 79, observes, the crucial factor determining the distribution of realis and irrealis mood in Palauan extraction constructions is whether or not a subject is extracted. If a subject is extracted, the verb retains realis mood but drops the subject agreement marker, whereas extraction of a non-subject requires irrealis mood marking, indirectly marked via the appropriate subject agreement marker. The wh-agreement morphology is summarized in table 2.

status of extracted element	wh-agreement
subject	realis mood & no subject verb agreement marker
non-subject	irrealis mood & subject verb agreement marker

Table 2: Wh-agreement in Palauan in the context of intraclausal extraction

In long distance extraction, one observes the same effect on wh-agreement as in Chamorro: the higher verb doesn't register the original grammatical relation of the extracted element but that of the constituent hosting the extracted element (Georgopoulos 1985, p. 82). Consider first subject extraction out of embedded clauses in (162).

(162) a. **Ng**te'a a **l**-ilsa   a Miriam [s el   Ø-milnguiu er a buk er ngii t]?
           who   ? 3.S.IR-saw ? Miriam   that R.read   P ? book P her
           Who did Miriam see reading her book?
      b. **Ng**te'a a **l**-oumerang [s el   **d**-omdasu   [s e   Ø-mo er a siabal t]]?
           who   ? 3.S.IR-believe   that 1.PL.S.IR-think   that R.go   P ? Japan
           Who do they believe that we think will go to Japan?
                                                    (Georgopoulos 1991, p. 91, ex. 53 & p. 92, ex. 54c)

(162a) contains an extracted subject. As expected, the verb in the lower clause registers the subject extraction by dropping the subject agreement marker. The matrix clause, however, shows wh-agreement typical for extracted objects, viz. the presence of irrealis mood. In other words, the extracted subject behaves like an extracted subject in the lower clause but as an extracted object in the higher clause. (162b) shows that this principle affects all intermediate clauses: both higher clauses show wh-agreement typical for extracted objects thereby registering the status of the constituent hosting the extracted element, whereas the lower clause registers the original status of the extracted element, viz. the subject relation, by dropping the subject agreement marker. Extracted objects show a similar non-uniform behavior.

(163) a. **Ng**-mengesireng   [s el   **mle**   pas   er a test a Roy].
           3.SG.S.R-R.surprising   that R.has R.passed P ? test ? Roy
           That Roy passed the test is surprising.
      b. A test el   **Ø**-mengesireng [s el **ble**   **le**-pas   t a Roy].
           ? test that R.surprising   that IR.has 3.S.IR-passed   ? Roy
           The test it is surprising that Roy passed.
                                                    (Chung & Georgopoulos 1988, ex. 17a & ex. 18a)

As the glosses in (163b) indicate, the lower clause registers the original status of the extracted element, viz. object, by the presence of irrealis mood morphology instead of the expected realis morphology, whereas the matrix clause registers the relation of the constituent hosting the extracted element, viz. subject, resulting in the omission of the subject agreement marker. In sum, Palauan too shows non-uniform behavior of extracted elements with respect to the agreement they determine. In fact, it is the same generalization that underlies both the Chamorro and the Palauan cases: in higher clauses, the effects due to extraction register the grammatical relation borne by the constituent *hosting* the extracted element prior to extraction to this higher clause.

Finally, I turn to wh-agreement effects in Malay (Cole & Hermon 1998). Transitive verbs in Malay are optionally accompanied by the prefix *meng*, cf. (164).

(164) a. Guru   itu   akan (men-)denda   Fatimah.
           teacher that will (MENG)punish Fatimah
           The teacher will punish Fatimah.
      b. Ali (mem-)beri Fatimah hadiah untuk hari lahirnya
           Ali (MENG)gave Fatimah present for   day birth
           Ali gave Fatimah a present for her birthday.
                                                    (Cole & Hermon 1998, ex. 23)

If a sentence contains an extracted object, then the prefix is obligatorily absent.

(165) Apa Ali (*mem)-beri t pada Fatimah?
       what Ali (MENG)gave   to Fatimah
       What did Ali give to Fatimah?

                                      (Cole & Hermon 1998, ex. 25a)

This obligatory omission is only triggered by extracted objects, not by extracted subjects (166a), indirect objects (166b), or adverbials (166c-d).

(166) a. Siapa t (mem-)beli   buku itu?
           who   (MENG)bought book that
           Who bought that book?
       b. Kepada siapa Mary (mem-)beri buku t?
           to   whom Mary (MENG)gave book
           To whom did Mary give the book?
       c. Kenapa Mary (mem-)beli   buku itu t?
           why   Mary (MENG)bought book that
           Why did Mary buy that book?
       d. Di mana John (mem-)beri Mary buku itu t?
           at where John (MENG)gave Mary book that
           Where did John give Mary that book?
                      (Cole & Hermon 1998, ex. 24, ex. 26c, ex. 26a, & ex. 26b)

Surprisingly, if the subject of an embedded object clause is long-distance extracted, the prefix of the matrix verb is obligatorily omitted, whereas that of the embedded verb can be retained.

(167) a. Siapa Bill (*mem-)beritahu ibunya   [$_S$ yang t (men-)yintai Fatimah]?
           who   Bill (MENG)tells   mother.his   that (MENG)love Fatimah
           Who does Bill tell his mother loves Fatimah?
       b. Siapa Ali (*mem-)buktikan [$_S$ yang t (men-)curi kereta]?
           who   Ali (MENG)prove   that (MENG)stole car
           Who did Ali prove stole the car?
                                      (Cole & Hermon 1998, ex. 27)

These examples show that in long-distance extractions, an extracted subject behaves like an extracted subject internal to the embedded clause but like an extracted object in the matrix clause. This behavior is identical to the behavior of extracted elements in Chamorro and Palauan, suggesting that the generalization in (159) is also at work in Malay: the matrix verbs register the status of the constituent hosting the extracted element, and not the status of the extracted element itself[46].

---

[46] I want to stress that my account of the Malay facts differs from the one given by Cole & Hermon 1998. According to these authors, what determines the deletion of the prefix *meng* is not so much whether an object or a non-object was extracted (or whether out of an object was extracted), but rather *whether or not it was an NP* that crossed a verb with the *meng*-prefix on its way to the final position. In the crucial

The generalization underlying wh-agreement effects in Chamorro, Palauan, and Malay receives a straightforward treatment if one assumes that it is the second option for determining the label of a relational marker that is at work in all three languages. The relevant rule encoding this option is given in (168).

(168) *Host = Creator Rule*
       Rel-Marker (A,B) ∧ Creator (C,A) → ∀D (Sponsor (D,B) → R-Support (C,D))

This rule – together with the Creator Law repeated in (169) – picks out a different sponsor for different relational markers, and not a unique one, contrary to what the rule at work in German, Spanish, and German does.

(169) *The Creator Law*
       Rel-Marker (A,B) ∧ Creator (C,A) → ∃D (Host (C,D) ∧ R-Sponsor (D,B) ∧ Arc-Command (B,C))

Consider their effects the extraction of an embedded subject, cf. (170).

(170)

---
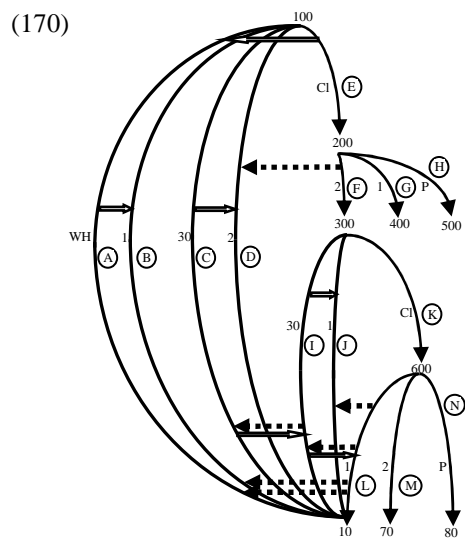
examples in (167), what is responsible for the deletion of *meng* is the fact that the NP *siapa* crossed the verb *membuktikan*, resulting in an obligatory deletion of *meng/mem*. Although both views are equally compatible with the data I have at my disposal, they make different predictions concerning (i) extraction of direct objects out of sentential subjects or adverbial clauses, and (ii) extraction of adverbials out of object clauses. As for (i), it is predicted that the extracted element in the higher clause will not trigger the deletion of *meng* because subjects and adverbials do not trigger *meng*-deletion. Unfortunately, subject and adverbial clauses are generally islands in Malay (Cole & Hermon 1998, p. 227), so the different predictions are untestable. As for (ii), it is predicted that the extracted adverbial in the higher clause will cause *meng*-deletion because the object status of the host is registered. Unfortunately, I didn't manage so far to obtain the relevant data. This state of affairs is certainly not an argument in favor of my analysis, but is neither one against it. In addition, whereas the relational analysis I offer is independently motivated by similar data from Chamorro and Palauan, the distinction between NPs and non-NPs seems generally to be of little relevance for the description of extraction asymmetries.

In the lower clause, only arc L qualifies as creator for the relational marker J because only L satisfies the Creator Law and the rule in (168). Consider why. Arcs A-H are not licit creators because they don't satisfy the demand that the creator has to be a host for the starter, in this case arc L, because J does not arc-command any of these arcs. K is not a possible creator because the definition of host requires a host to be a structural-arc; K, however, is a non-structural-arc. I, M, and N don't satisfy the definition of host either because they don't R-support the sponsor of J, viz. L. L itself however does satisfy the definition of host: L is a shallow arc (it is not locally erased and foreign erased by an overlay-arc, viz. the 30-arc), and there is another arc that is a starter which is an R-branch of the starter, viz. L itself. Turning to the higher clause, L only qualifies as a creator for B because of the Proper-Overlay Creator Law, repeated in (171)

(171) *The Proper-Overlay Creator Law*
      Rel-Marker (A,B) $\wedge$ Creator (C,A) $\wedge$ Proper-Overlay-Arc (B) $\rightarrow$ $\forall$D
      (Sponsor (D,B) $\rightarrow$ Overlap (C,D))

The only arc that overlaps the sponsor of A, viz. the starter L, and that satisfies the definition of host is L itself. As for D, L does not qualify as a creator for it because the rule in (168) says that the creator has to be an R-support of the arcs sponsoring the arc the relational marker belongs to. C is sponsored by I, and L does not R-support I. The only arc that does so and satisfies the definition of host is F: it is an R-support of I, it is a structural-arc, and it R-supports the starter L. E is not a possible creator because it is not a structural-arc. And none of A, B, C, D, G, or H can act as creators because they are not hosts: they don't R-support the starter L. Consequently, the relational marker A is labeled '1', the relational markers D is labeled '2', and the relational marker J is labeled '1'.
Given such structures, the chameleon like behavior of extracted elements in Chamorro, Palauan, and Malay is easy to explain. These languages have rules that specify agreement properties on verbs in the context of extraction[47]. But similar to Spanish and Yoruba, they not only make reference to 30-arcs but also to the relational markers accompanying them. For example, the Palauan rules look as follows[48].

(172) *Palauan Subject Rule*
      If a relational marker A labeled '1' and belonging to a 30-arc B is neighbor of a Cl-arc C, then the P-arc branch D of C is headed by a verb that carries realis mood and does not contain a subject agreement marker.

---

[47] The rules to follow suffer from a general defect, viz. that concepts like 'verbal agreement' and 'agreement controller' have not been given any characterization in APG terms yet. If such were available, the rules could be simplified by specifying agreement controllers depending on the presence of 30-arcs.
[48] The rules are given in informal terms because at this point I have no idea how to formally capture the notion 'specified for mood' or the notion 'contains/does not contain a subject agreement marker'.

(173) *Palauan Non-Subject Rule*
   If a relational marker A not labeled '1' and belonging to a 30-arc B is
   neighbor of a Cl-arc C, then the P-arc branch D of C is headed by a verb that
   carries irrealis mood and contains a subject agreement marker.

Taking the rule in (168) to be at work in Palauan, the structure for a sentence like
(162a), repeated here as (174), where a subject is extracted out of an embedded
object clause, would look as shown in (175).

(174) Ngte'a a **l**-ilsa   a Miriam [$_S$ el   Ø-milnguiu er a buk   er ngii t]?
     who   ? 3.S.IR-saw ? Miriam   that R.read   P ? book P her
     Who did Miriam see reading her book?

                                                (Georgopoulos 1991, 53)

(175)
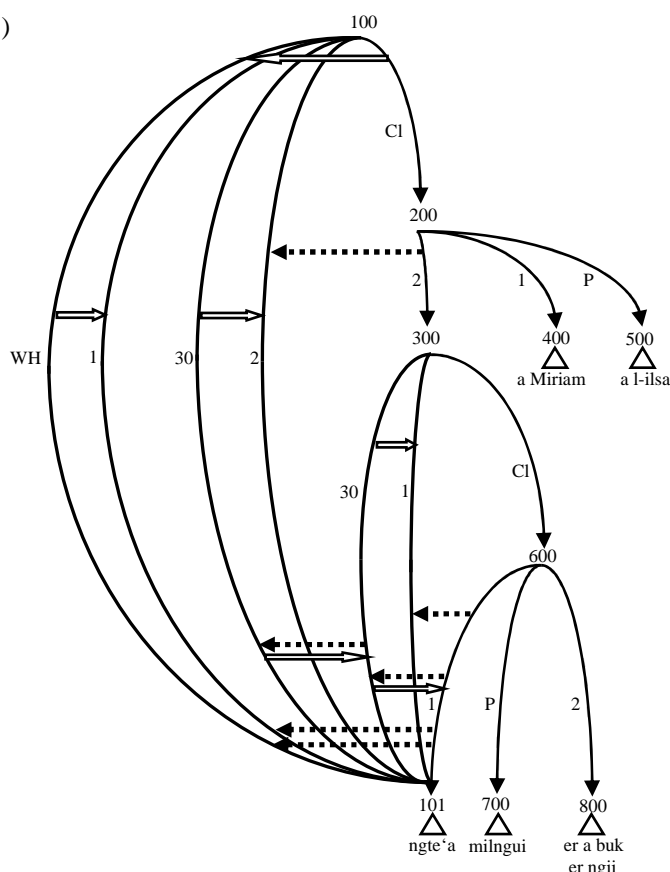
The chameleon behavior of an extracted element becomes understandable. Since the
relational marker gets its label from the starter, the verb in the embedded clause is
subject to the Palauan Subject Rule. Therefore the verb is specified for realis mood

and does not contain a subject agreement marker. The relational marker belonging to the 30-arc in the matrix clause however gets its label from the element hosting the starter, viz. the 2-arc. Consequently, the verb of the embedded clause is subject to the Palauan Non-Subject Rule, and therefore carries irrealis mood and does contain a subject agreement marker. So, the chameleon like behavior of extracted elements is simply a consequence of the fact that it is not the extracted element itself that affects verbal morphology, but an element that is only indirectly connected to it, viz. the relational marker. And importantly, this relational marker can differ in its relation from the relation the extracted element bore prior to extraction.

This account carries over to Chamorro and Malay, although I restrict myself to Chamorro. Chamorro is subject to the rules in (176)-(179).

(176) *Chamorro Subject Rule*
      If a relational marker A labeled '1' and belonging to a 30-arc B is neighbor of a Cl-arc C, then the P-arc branch D of C does not specify subject verb agreement and carries the affix *um*.

(177) *Chamorro Direct Object Rule*
      If a relational marker A labeled '2' and belonging to a 30-arc B is neighbor of a Cl-arc C, then the P-arc branch D of C does not specify subject verb agreement and carries the affix *in*, and D's POS-arc branch optionally sponsors a parallel N-arc[49].

(178) *Chamorro Oblique Rule*
      If a relational marker A labeled 'Obl' and belonging to a 30-arc B is neighbor of a Cl‑arc C, then the P-arc branch D of C does not specify subject verb agreement and D's POS-arc branch sponsors a parallel N-arc.

Given the rule in (168), the structure for a sentence like (154b) – repeated in (179) – featuring extraction of a direct object out of a subject clause looks (180).

(179) Hafa **um**-istotba   hao [s ni   **Ø**-malago'-**Ø**-ña   i   lahi-mu t]?
      what WAGRS-disturb you   that want-N-his.(WAGRO) the son-your
      What does it disturb you that your son wants?
                                                         (Chung & Georgopoulos 1988, ex. 16a)

---

[49] The sponsoring of an N-arc by the P-arc's POS-arc branch is intended to capture the nominalization of the verb.

(180)

In the embedded subject clause, the relational marker is sponsored by starter, hence bears the label '2' so that it triggers the Chamorro Direct Object Rule in (177). In the matrix clause however, the sponsor for the relational marker is the element hosting the extracted direct object, viz. the 1-arc. Consequently, this arc bears the label '1', and the Chamorro Subject Rule in (176) has to be satisfied, resulting verbal morphology typical for extracted subjects. Also here, the chameleon like behavior of an extracted element in Chamorro is a consequence of the fact that it is not the extracted element itself that affects verbal morphology, but an element that is only indirectly connected to it, viz. the relational marker.

7.3.3.2 Chameleon Extractions II: Complementizer Alternations

The second type of chameleon extractions I would like to discuss are complementizer alternations in English and French. In these cases too, the effect of an extracted element depends on the context the extracted element appears in. But it is not verbal morphology that is affected but the choice of complementizers. Despite this difference, the pattern found in English and French is identical to that in

Chamorro, Palauan, and Malay: an extracted element behaves as an extracted element of type A in one clause, but as an extracted element of type B in another clause.
As is well-known, if an English subject is extracted from an embedded non-relative clause, the complementizer must be dropped, whereas it can be retained if a non-subject is extracted (the so-called *that-trace* effect).

(181) a. Who do you think [$_S$ (*that) t fixed the car with John rapidly in a simple way]?
      b. What do you think [$_S$ (that) Peter fixed t with John in a simple way]?
      c. How do you think [$_S$ (that) Peter fixed the car with John t]?
      d. With whom do you think [$_S$ (that) Peter fixed the car t in a simple way]?

Importantly, this effect is restricted to the clause in which the extracted subject originated only. If a subject is extracted out of a doubly embedded clause, then the complementizer in the 'middle' clause can be retained.

(182) Who do you think [$_S$ (that) she said [$_S$ (*that) t fixed the car]]?

What we observe is that although the middle clause contains at some stage an extracted subject, this extracted subject doesn't trigger the complementizer deletion that is typical for extracted subjects. In contrast, it behaves like an extracted non-subject. Viewed in light of data discussed in connection with wh-agreement, this effect is parallel to the cases observed there: the effect in a higher clause makes reference to the grammatical relation of the clause hosting the extracted element. In (182), this is the direct object relation, and consequently, the effect of the extracted element is that of an extracted non-subject, accounting for the optionality of the complementizer deletion. The effect carries over to English restrictive relative clauses, albeit in a different way. If a relative pronoun is extracted clause-internally and subsequently deleted, then the complementizer is obligatory *present* if the relative pronoun is an original subject, whereas it need only be optionally present if the relative pronoun is originally a non-subject[50].

(183) a. The man [$_S$ *(that) t fixed the car very rapidly in a simple way].
      b. The car [$_S$ (that) the man fixed t very rapidly in a simple way].
      c. The way [$_S$ (that) the man fixed the car very rapidly t].

If the relative pronoun is extracted to some higher clause, then this difference vanishes in the higher clause: the complementizer is always optional, irrespective of the grammatical relation the extracted relative pronoun had prior to extraction.

(184) a. The man [$_S$ (that) I think [$_S$ *(that) t fixed the car very rapidly in a simple way]].
      b. The car [$_S$ (that) I think [$_S$ (that) the man fixed t very rapidly in a simple way]].
      c. The way [$_S$ (that) I think [$_S$ (that) the man fixed the car very rapidly t]].

---

[50] PPs are impossible to illustrate here due to the idiosyncrasy of English in not allowing deletion of relative proforms of the category PP. That it is an idiosyncrasy and does not follow from some allegedly universal condition on the 'recoverability of deletion', informally suggested in Chomsky & Lasnik 1977, has been shown by Maling 1977 and Joseph 1980 for Greek where relative PP-proforms are deleted.

Similar to the examples in (183), the effect of the complementizer deletion in (184) for an extracted subject in the higher clause is not the one typical for extracted subjects but for an extracted non-subject. As the clause hosting the extracted subject is a direct object clause, and since complementizer deletion makes reference to the grammatical relation of the host clause in the case of long distance extraction, the contrast between (183a) and (184a) is expected. The generalization underlying this alternation is formulated in (185), which is in spirit similar to the one suggested in Postal 2004, p. 76[51].

(185)   *The alternation between* that *and Ø in higher clauses is determined by the grammatical relation of the constituent that <u>hosted</u> the extracted element prior to extraction to the next clause.*

In French, a similar effect is present but French does not distinguish between relative and non-relative extraction contexts. Extraction of a subject affects the shape of the complementizer: instead of the regular complementizer *que*, the exceptional form *qui* appears.

(186)   a.* Qui penses-tu [_S que t l'a   vu]?
            who think-you   QUE   her'has seen
        b. Qui penses-tu [_S qui t l'a   vu]?
            who think-you   QUI   her'has seen
            Who do you think has seen her?

(187)   a. Qui penses-tu [_S que Marie a   vu t]?
            who think-you   QUE Marie has   seen
        b.* Qui penses-tu [_S qui Marie a   vu t]?
            who think-you   QUI Marie has   seen
            Who do you think Marie has seen?

(188)   a.* L'homme [_S que t la   tue].
            the'man   QUE   her kills
        b. L'homme [_S qui t la   tue].
            the'man   QUI   her kills
            The man that kills her.

---

[51] This statement is seemingly incompatible with the adverb effect (cf. Culicover 1993), illustrated in (i).
(i)   This is the nurse who he believes that *(under those circumstances) would watch her father.
As the (i) shows, the presence of a sentential adverbial in a clause with a subject gap suspends the requirement to drop the complementizer *that*. Instead of adding this possibility to the rule, I speculate that the sentential adverbial defines a separate clause. In other words, the *that*-clause in (i) is actually two clauses. Given this view, the cooccurrence of *that* and a sentential adverbial is a special case of the general availability of *that* in higher clauses. Two arguments support this biclausal analysis. First, as observed by Culicover 1993, p. 558, the clause containing a sentential adverbial is not a topic island; given my biclausal analysis, this is expected because the relevant clause is two clauses, and nothing bars extraction across two clauses in English. Second, according to the judgments of the informants I consulted, the presence of *that* in (i) is optional, cf. (ii).
(ii) This is the nurse who he believes under those circumstances would watch her father.
This optionality is then simply a reflex of the optionality of *that* in higher clauses in general.

(189) a. L'homme [$_S$ que Marie tue   t].
          the'man   QUE Marie kills
     b.* L'homme [$_S$ qui Marie tue   t].
          the'man   QUI she   kills
          The man that Marie kills.

The examples in (186) show that a wh-questioned subject triggers the
complementizer alternation, while those in (187) show that only subjects do so. The
examples in (188)-(189) show that this alternation is not restricted to wh-question
extraction but that it is present in restrictive relative clauses as well (the only
difference between relative clauses and interrogatives is that the extracted element in
relative clauses is not overtly realized). This alternation is however restricted to the
clause in which the extracted element originated.[52].

(190) a. Qui penses-tu [$_S$ qu'a   dit Jean [$_S$ qui t nous a   vus]]?
          who think-you   QUE'has said Jean   QUI   us   has seen
     b.* Qui penses-tu [$_S$ qui a   dit Jean [$_S$ que t nous a   vus]]?
          who think-you   QUI has said Jean   QUE   us   has seen
          Who do you think Jean said has seen us?

(191) a. La table [$_S$ que je pense [$_S$ qui t est tombée]].
          the table   QUE I think   QUI is fallen

                                                              (Sportiche 2011, ex. 34a)

     b.* La table [$_S$ qui je pense [$_S$ qui t est tombée]].
          the table   QUI I think   QUI is fallen
          The table that I think fell.

(190a) contains an extracted subject originating in a doubly embedded clause.
Importantly, the middle clause does not manifest *qui* instead of *que* despite the fact
that it contains an extracted subject. A similar effect can be observed in the relative
clauses in (191): the higher clause has the regular complementizer *que*, and not the
form *qui* found in the lower one. What is going on in French is similar to what is
going on in English: what is registered in case of long distance extraction is the
grammatical relation of the clause hosting the extracted element, and not the
grammatical relation of the extracted element itself[53]. The generalization covering
the data in French is formulated in (192).

---

[52] The examples in (190) were kindly provided by Caroline Féry (p.c., 2012/01/07).

[53] Another language with complementizer alternation in the context of extraction that *could* be analyzed
in a parallel way is Irish. The standard analysis (originally due to McCloskey 1979 et seq., and ever since
widely adopted, for example Carnie 2013, pp. 362 and Boeckx 2008, pp. 14-6) has it that Irish employs
two complementizers in extraction constructions, viz. a^L and a^N. The former one is said to occur if
extraction leaves a gap, whereas the latter one is used when a resumptive pronoun is left behind.

(i) a. A   fear [$_S$ a bhuail tú   t].
        the man a^L struck you
    b. A   fear [$_S$ ar   bhuail tú   é].
        the man a^N.PAST struck you him
        The man that you struck.

                                                              (McCloskey 1990, ex. 18 & ex. 19)

(192) *The alternation between* que *and* qui *in higher clauses is determined by the grammatical relation of the constituent that <u>hosted</u> the extracted element prior to extraction to the next clause.*

Given the parallelism between wh-agreement in Chamorro, Palauan, and Malay, and the complementizer alternations in English and French, the following analysis for the alternations suggests itself easily. Ignoring relative clauses, English for example would be subject to the following rule.

(193) *English* that-*Rule*
       If there is a relational marker labeled '1' belonging to a 30-arc, then any neighboring arc hosting the complementizer *that* is erased by this relational marker.

Given the rule in (168), the structure for (182) – repeated here in (194) – looks as sketched in (195).

(194) Who do you think [$_S$ (that) she said [$_S$ (*that) t fixed the car]]?

As Noonan 2002 points out, this view is not without problems because extracted adjuncts require the complementizer a^N but leave a gap.

(ii) a. Cén   fáth   a   dtáinig tú   t?
         which reason a^N came you
         Why did you come?
     b. An áit   [$_S$ a   raibh muid t].
         the place a^N were we
         The place where we were.
     c. Céard leis   a   ndearna tú   é t?
         what with.it a^N did   you it
         With what did you do it?

                                                                    (Noonan 2002, ex. 7)

According to Noonan 2002, what additionally matters is whether or not a subject or an object is extracted, that is, only extracted subjects and objects require a^L, but not extracted adjuncts. Interestingly, if an adjunct is extracted out of an object clause, then a^N will appear only in the object clause, whereas the higher clause requires a^L.

(iii) a. Cé   shíleann Máire [$_S$ a   chreideann Seán [$_S$ ar   labhair Nic leis]]?
          who thinks   Máire a^L believes   Seán a^N.PAST spoke   Nic with.him
          Who does Máire think that Seán believes that Nic spoke with?
      b. An galar   [$_S$ a   chuala mé [$_S$ ar   cailleadh muintir an oileáin   leis]].
          the disease a^L heard I a^N.PAST was.lost people the island.GEN with.it
          The disease from which it is thought that the people of the island died.

                                                                   (Noonan 2002, ex. 11)

If correct, the pattern would be identical to the effects in other languages, viz. that the element in some higher clause registers the relation of the constituent hosting the extracted element and not the relation of extracted element it bore prior to extraction. McCloskey 2002, p. 209-210, claims that examples of extracted adjuncts plus the complementizer a^N involve null pronouns, thereby fitting his description of the alternation. But this solution cannot be correct for as he himself pointed out in an earlier paper (McCloskey 1990, p. 243, fn. 10), "there are no adjunct resumptive pronouns". I have nevertheless not chosen to include Irish into the main text because some adjuncts do occur with a^L (Noonan 2002, ex. 16; McCloskey 2002, part 7) and because the complementizer alternations involve more complex patterns that are problematic for either analysis. In other words, the data are too inconclusive to draw any firm conclusion about the underlying regularities determining the complementizer alternations in Irish yet.

(195)
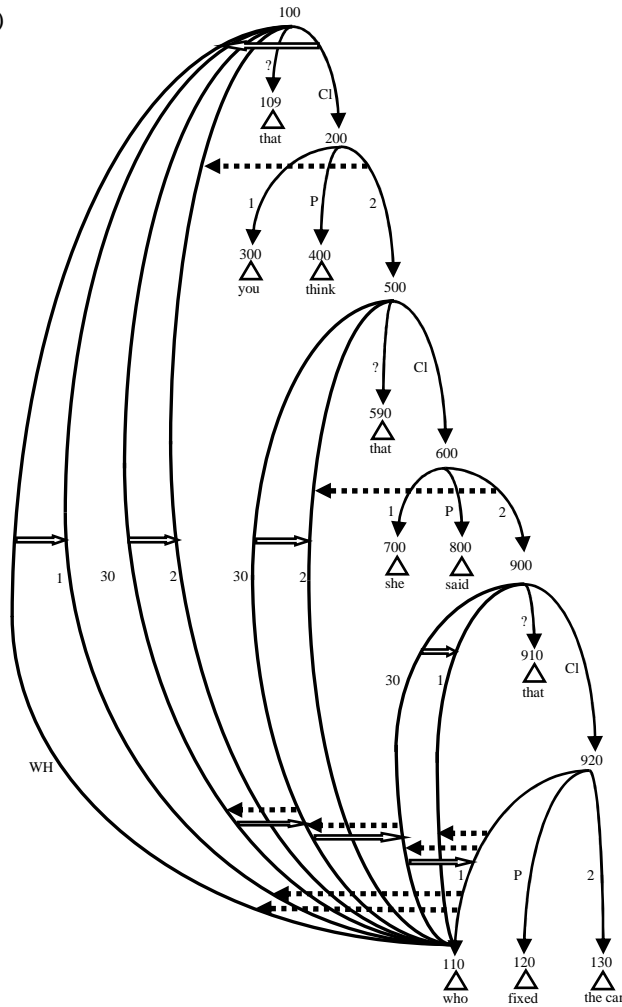
What goes on in this structure is what goes on in Chamorro, Palauan, and Malay: the relational marker internal to the clause the extracted element originates in is labeled by the starter, that is, the relational marker specifies the same relation as the extracted element prior to extraction, viz. '1'. Therefore, the English *that*-Rule has to be satisfied, erasing the complementizer. In all higher clauses however, the relational marker gets is label from the element hosting the intermediate occurrence of the extracted element, fomally encoded via 30-arcs. As these clauses are uniformly direct object clauses, and since English that-Rule is defined subjects only, the complementizer can be retained[54].

---

[54] Of course, this wrongly predicts that the complementizer in the matrix should be realized, contrary to fact. I assume that this the effect of a more general rule, however formulated, banning complementizer from matrix clauses altogether.

This account carries over in a more or less parallel way to French, which is subject
to the rule in (196).

(196) *French* qui-*Rule*
       Iff there is a relational marker labeled '1' belonging to a 30-arc, then any
       neighboring arc hosting a complementizer is headed by *qui*.

The structure for a French sentence like (190a), repeated here as (197), is illustrated
in (198).

(197) Qui penses-tu [$_S$ qu'a   dit Jean [$_S$ qui t nous a   vus]]?
       who think-you   QUE'has said Jean   QUI us   has seen
       Who do you think Jean said has seen us?

(198)
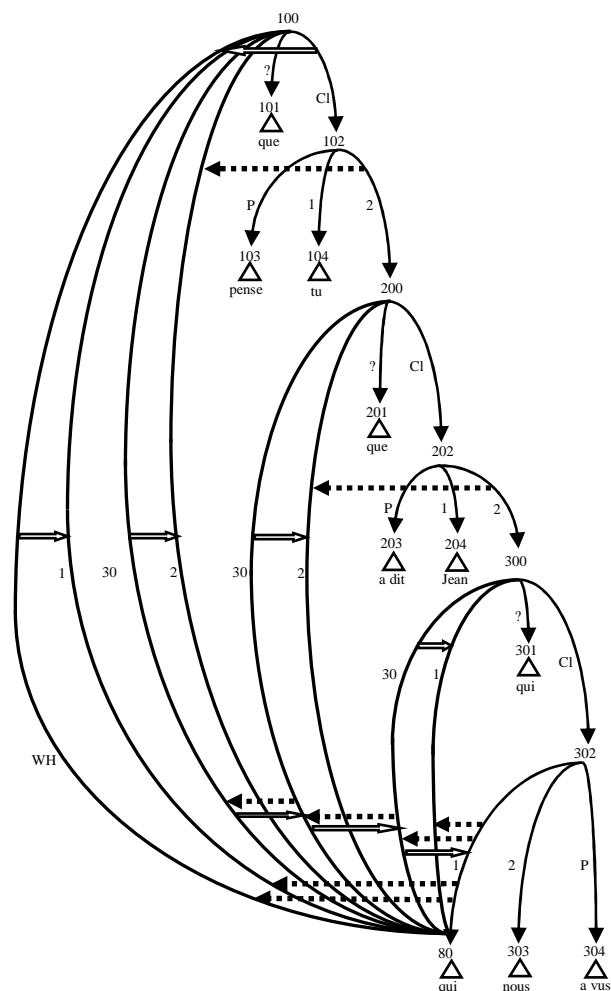
The relational marker internal to the clause the extracted element originates in is labeled by the starter, that is, the relational marker specifies the same relation the extracted element bore prior to extraction, viz. '1'. Therefore, the French qui-Rule has to be satisfied, requiring the complementizer to be headed by *qui*. In all higher clauses however, the relational marker gets is label from the element hosting the intermediate occurrence of the extracted element, fomally encoded via 30-arcs. As these clauses are uniformly direct object clauses, and since the French qui-Rule is defined for subjects only, the regular complementizer *que* is present[55].

7.3.3.3   The Special Status of Proper-Overlay-Arcs

I have been assuming so far that the final position of an extracted element contains two occurrences of this element, one heading a 30-arc, the other one the proper-overlay-arc. I have also been assuming that relational markers of proper-overlay-arcs are always labeled by the starter. The relevant law is repeated in (199).

(199)   *The Proper-Overlay Creator Law*
        Rel-Marker (A,B) $\wedge$ Creator (C,A) $\wedge$ Proper-Overlay-Arc (B) $\rightarrow$ $\forall$D (Sponsor (D,B) $\rightarrow$ Overlap (C,D))

I have not however provided any support for this idea. Such support can be provided though, and it comes again from Chamorro.

Chamorro not only shows wh-agreement effects, it also shows complementizer alternations. I will not attempt to give a comprehensive description of the Chamorro complementizer system, but only mention two relevant points. First, the choice of complementizers in non-extraction contexts normally depends on certain familiar features of clauses, such as finiteness, root vs. embedded clause status, and interrogativity (cf. Chung 1998, 222-4). Second, and more importantly, in extraction contexts, the choice of the complementizer depends on the status of the extracted element. If an element belonging to what I call *class I* is extracted (comprising subjects, objects, certain obliques, but also manner adverbials), then the complementizer is obligatorily zero. If an element belonging to what I call *class II* is extracted (comprising oblique relations other than those from class I and all other adverbials), then the complementizer *na* (in the Guam dialect of Chamorro) or *nai/ni* (in the Saipan dialect of Chamorro) has to be used. This is summarized in table 3 and illustrated in (200) and (201) for elements of Class I and Class II, respectively.

status of the extracted element	complementizer
Class I	Ø
Class II	na (Guam), nai/ni (Saipan)

Table 3: complementizer alternations in Chamorro

---

[55] Similar to English, I will assume that complementizers in matrix clauses are ungrammatical for an independent reason barring complementizers in matrix clauses altogether.

(200) a. Hafa **Ø**   malago'-**Ø**-mu   t?
        what COMP want-N-your(WAGRO)
        What do you want?

     b. Hafa taimänu **Ø**   mamokkat   t?
        how   COMP walk.(WAGRO)
        How do you walk?

                             (Chung 1998, ch. 6, ex. 34a & ex. 36a)

(201) a. Ginin hayi **na**   un-risibi   katta t?
        from who COMP AGR-receive letter
        From whom did you receive the letter?

     b. Gi   manu **ni**   man-ma'añao i   famagu'un [$_S$ pära ufañ-aga t]?
        LOC where COMP AGR-afraid   the children   FUT AGR-stay
        Where are the children afraid to stay?

                             (Chung 1998, ch. 6, ex. 38a & ex. 39c)

(200a) contains an extracted oblique belonging to class I so the zero complementizer is used and the verb shows wh-agreement typical for obliques. (200b) contains an extracted manner adverbial and the zero complementizer is again mandatory. The sentences in (201) illustrate extractions of class II elements triggering the presence of *na/nai/ni*: the a-sentence contains an element whose previous relation is often described as *source*, whereas the b-sentence contains a locational adverbial[56].

Although both complementizers and verbs register the presence of an extracted element, they differ in two ways. First, wh-agreement marks the verb of every clause passed through by an extraction, whereas complementizer alternation is restricted to the clause hosting the extracted element in its final position. And second, whereas wh-agreement in higher clauses registers the relation of the constituent hosting the extracted element, the complementizer registers the relation of the starter. The consequence of this difference between wh-agreement and complementizer alternations is that in case an element is extracted out of an embedded clause, then one expects the extracted element in the matrix clause to behave like the constituent hosting it with respect to wh-agreement, but like the starter concerning the choice of the complementizer. In other words, the verb registers the relation borne by the clause in which the extracted element originates, whereas the complementizer registers the original relation of the extracted element, that is, the one of the starter. And this expectation is in fact borne out, as (202) shows.

(202) Manu na lepblu **Ø**   **Ø**-malagu-**Ø**-ñiha   [$_S$ **na**   utaitai t]
     which L   book COMP want-N-their(WAGRO)   COMP read
     Which book do they want to read?

                             (Chung 1998, ch. 6, ex. 42a)

---

[56] The sentences in (201) seem weird because none of them features wh-agreement. However, this follows from independent reasons. (201a) shows no wh-agreement because it is generally optional for second objects (Chung 1998, p. 239). The matrix clause in (201b) has no wh-agreement either because wh-agreement on predicates of higher clauses is generally facultative (cf fn. 44). Finally, the lack of wh-agreement on the predicate of the embedded clause in (201b) is due to its irrealis mood; and as mentioned in fn. 42, wh-agreement is restricted to clause with realis mood.

In (202), an object is extracted out of an oblique clause. Internal to the oblique clause, no wh-agreement is present due its irrealis mood (cf. fn. 42), and the complementizer is *na*. This shows that the choice of the complementizer does not depend on the extracted element in this context because if it had, the zero complementizer would occur because objects belong to class I. In the higher clause, the verb shows wh-agreement typical for obliques, indicated by the nominalization and the absence of the affix *in*. This is so because wh-agreement in higher clauses reflects the relation of the host clause of the extracted element (as (156b) shows, *want* selects an oblique in Chamorro). The complementizer, however, reflects the original object relation of the extracted element. If it reflected the relation of the host clause, the complementizer typical for class II would occur, viz. *na/nai/ni*, because the oblique selected by the matrix predicate *want* in Chamorro belongs to class II. So what (202) shows is that the extracted element *manu na lepblu* behaves non-uniformly even within a *single* clause, in this case in the matrix clause.

Having both a 30-arc and the the proper-overlay-arc at one's disposal plus the law that a proper-overlay-arc is always sponsored by its starter, this pattern is easy to analyze. The structure for (202) is given in (203).

(203)

In this structure, the relational marker belonging to the proper-overlay-arc is sponsored the starter, hence it bears the label '2'. The relational marker accompanying the 30-arc neighboring the proper-overlay-arc however is labeled by the rule in (168), independently motivated by the wh-agreement effects in Chamorro. This results in the label 'Obl' for the 30-arc's relational marker, which label reflects the label of the host of the extracted element. So eventually, one ends up with two arcs headed by the extracted element that are each accompanied by relational markers bearing *different* labels. Consequently, each relational marker can trigger a separate effect. And this is precisely what happens in Chamorro. The 30-arc's relational marker triggers wh-agreement typical for extracted obliques on the verb of the matrix clause in accordance with the rule in (178). And the proper-overlay-arc's relational marker controls the choice of the complementizer in accordance to the rules sketched in (204) and (205).

(204)   *Chamorro Class I Complementizer Rule*
        If a relational marker A belongs to some proper-overlay-arc B neighboring an arc C hosting a complementizer, then C is headed by Ø.

(205)   *Chamorro Class II Complementizer Rule*
        If a relational marker A belongs to some proper-overlay-arc B neighboring an arc C hosting a complementizer, then C is headed by *na/nai/ni*.

I want to stress again that having either a 30-arc or the proper-overlay-arc in the final position of the extracted element is insufficient to account for the pattern exemplified in (202). If only the 30-arc and its relational marker were present, then one would correctly capture the type of wh-agreement found on the verb in the matrix clause. But one would fail to account for the choice of the zero-complementizer because the extracted element is expected to behave as an extracted oblique as well, so that the complementizer *na*/*nai*/*ni* is expected, contrary to fact. Similarly, if only the proper-overlay-arc and its relational marker were present, then the choice of the complementizer poses no problem because the extracted element behaves as an extracted object, thereby demanding the presence of the zero-complementizer. However, if it behaves as an extracted object for the purpose of the choice of the correct complementizer, it should also behave like a direct object with respect to wh-agreement. But it doesn't, for wh-agreement with extracted direct objects would result in the infixation of *in* into the verb, as required by the rule in (177). Consequently, two occurrences of an extracted element are needed, each subject to different sponsoring regulations for their relational markers.

7.3.4   Extractions and the L-Graph

The analysis of extraction proposed so far has a feature that casts some doubt on its adequacy. The feature I have in mind is that all arcs involved in expressing an extraction relation are *sponsored*. This means that all these arcs are non-initial arcs

and consequently not part of the L-Graph. This is however a problematic claim because extractions usually do have an impact on interpretation, which fact is unfortunately not captured by the analysis developed so far. For example, wh-question extraction is usually connected to interrogativity, certainly an issue of relevance for semantics, but the account developed so far leaves this completely unexpressed. In a similar vein, many languages possess a number of extractions that too are clearly connected to semantic notions, viz. topicalization, focus movement, contrastive left dislocation etc. If all of these only involved sponsored arcs, the account would fail to express that for example a topicalized element is an extracted topic, and not something else.

Fortunately, the analysis developed so far can be easily extended in order to fix this defect. What I want to propose is that every element targeted by extraction needs to overlap an initial arc of the set of trigger-arcs, mentioned briefly in the chapter 5. These arcs indicate the relevant semantic notion connected to an extracted element, like interrogativity, topichood, focus, etc. This is illustrated in (207) for (206).

(206) Wen glaubst du   dass sie t liebt?
       who believe   you that she   loves
       Who do you think she loves?

(207)
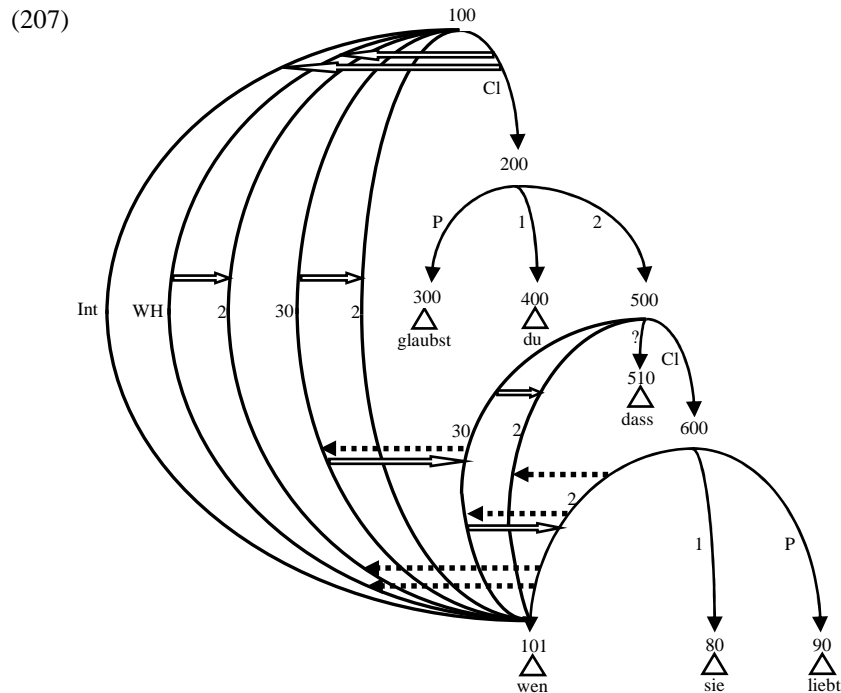
This structure is basically identical to the structure suggested so far for extractions but additionally contains arc A labeled 'Int' (for interrogativity), capturing that the extracted element is also a questioned element. As this arc is not sponsored, it is an

initial arc and therefore visible in the L-Graph. As this arc must not be part of the S-Graph, it has to be erased; otherwise the element heading it and the terminator 30-arc would be realized, resulting in a double realization of *wen* in the highest position in (206), contrary to what one finds. In order to account for the distribution of trigger arcs, the following two laws are needed.

(207) *The Trigger-Arc Neighbor Law*
       Trigger-Arc (A) → ∃B (Cl-Arc (B) ∧ Neighbor (A,B) ∧ Erase (B,A))

(209) *The Trigger-Arc Initial Law*
       Trigger-Arc (A) → Initial Arc (A)

The first law not only guarantees that trigger arcs are erased by a neighboring C-arcs, it also expresses that trigger arcs have to be neighbors of CL-arcs. The second law ensures that trigger arcs are initial arcs.
In addition to this, the connection between trigger arcs and extraction has to be established for neither of the two laws so far achieved this. The first law that is of importance for this connection is the one in (210).

(210) *The Trigger Overlap Law*
       Trigger-Arc (A) → ∃B (Overlap (A,B) ∧ Initial Arc (B))

This law requires that every trigger arc overlaps some other initial arc, thereby guaranteeing that notions such as topic, focus, or questioned are only defined for elements that already bear some other grammatical relation. That the overlapped arc has to be an initial arc is of great importance. Imagine that this condition did not hold; then the trigger arc could overlap some sponsored arc whose sponsor is *not* a predecessor (that is, the sponsoring arc does not overlap the arc it sponsors). In such a scenario, an element that is not present in the L-Graph would be marked as topic. But then, the whole motivation for trigger arcs would be lost because triggers are needed to indicate that some element bears an additional semantic role. If this marking is not restricted to initial arcs, the marking could be without any effect. As usual, the arc overlapped by a trigger arc is given a special name, cf. (211).

(211) Def.: *Target*
       Target (A,B) ↔ ∃B (Trigger-Arc (B) ∧ Overlap (A,B) ∧ Initial Arc (A))

Before I give the law that connects targets to extraction, I first suggest the following law.

(212) *The Target Uniqueness Law*
       Target (A,B) ∧ Target (A,C) → B = C

This law captures that an element can only have one additional semantic role, thereby excluding cases where for example some element is both the head of a topic-arc and a focus-arc.

Next, some law has to establish a relation between the target and the starter. The easiest formulation would simply demand that every starter is a target. But this easy formulation is obviously wrong: for this would mean that only initial arcs can be starters, whereas in fact, starters can be sponsored arcs. For example, in the unaccusative *Who dies*, it is the sponsored subject-arc that is the starter, not the initial object arc. Moreover, as shown in the previous chapter in section 7, case and adpositional marking structures always involve sponsored arcs and this marking is retained under extraction, providing another example for starters that are sponsored. In order to capture this non-trivial connection between starters and targets, I propose the following law.

(213) *The Starter-Target Law*
       Starter (A,B) → ∃C∃D (R-Sponsor (C,A) ∧ Target (C,D))

This law says that for every starter A there is a target C that R-sponsors A. This establishes the relevant connection between the starter and the target. In a sentence such as *Who dies*, the target is the initial 2-arc, whereas the starter is the closure 1-arc. As the closure 1-arc is R-sponsored by the 2-arc, the 1-arc is an admissible starter for the target 2-arc. The account carries over to case and adpositional marking structures, all of which involve closure arcs that are R-sponsored by some initial arc. It is useful for later purposes to pick out targets connected to a starter; the definition in (214) accomplishes this.

(213) Def.: *Starter-Target*
       Starter-Target (A,B) ↔ Target (A,B) ∧ ∃C∃D (Starter (C,D) ∧ R-Sponsor (A,C))

The Starter-Target Law paves the way for an analysis of *type 2 in situ* languages, that is, for those *in situ* languages that are not island sensitive. The Starter-Target Law only requires the presence of a target if a starter is present but not vice versa. In other words, there can be a target without there being a starter. This means that there can be for example an arc A overlapping an Int-arc B such that A does not R-sponsor some arc C that is a starter. This amounts to a situation where some element is interpreted as an interrogative element without undergoing *any extraction at all*. It is such structures that I assume underlie *type 2 in situ* languages. The lack of island effects is simply due to the fact that no extraction is present, not even an invisible one. That this type of *in situ* nevertheless marks interrogativity is simply a consequence of the presence of the relevant trigger arc indicating interrogativity. Languages belonging to *type 2 in situ* languages include Malay and Bahasa Indonesian. Their lack of island sensitivity is illustrated in (215) and (216) for Malay and Bahasa Indonesian, respectively; the a-examples illustrate the Complex NP island, the b-examples the Subject island, and the c-examples the Adjunct island; the *in situ* wh-phrases are set in **bold**.

(215) a. Kamu sayang perempuan [$_S$ yang telah   berjumpa **siapa**]?
            you   love   woman   that already meet   who
            Who do you love the woman that met?

    b. [s Yang Ali mengahwini **siapa**] mengecewakan ibunya?
       that Ali married   who   upset   his.mother
      Who did that Ali married upset his mother?
    c. Ali dipecat [s kerana Fatimah fikir   [s dia membeli **apa**]]?
      Ali was.fired because Fatimah thinks he bought   what
      What was Ali fired because Fatimah thinks he bought?
                    (Cole & Hermon 1998, ex. 13b, ex. 14, & ex. 15)

(216) a. Kamu sukai cerita [s yang mengeritik **siapa**] itu?
      you   like   stories that criticize   who   the
      Who do you like the stories that criticize?
    b. Kamu menggira [NP gambar **siapa**] dijual?
      you   think   pictures who be.sold
      Who do you think that pictures of were sold?
    c. Kamu mencemburui Bill [s karena saya berbicara dengan **siapa**]?
      you be.jealous   Bill because I   spoke   with   who
      Who did you get jealous of Bill because I spoke with?
                (Saddy 1991, p. 136, ex. 27& ex. 29, p. 137, ex. 31)

The simplified structure for (216c) is sketched in (217).

(217)
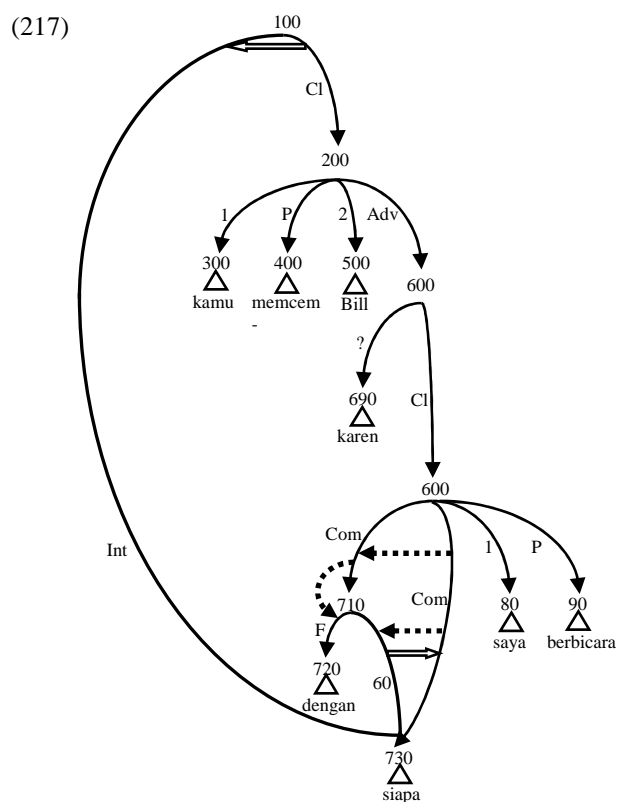
The grammaticality of the sentence corresponding to the structure in (217) comes as no surprise with respect to the Island Law, repeated in (217) for convenience.

(218) *The Island Law (First Version)*
       Starter (A,B) ∧ Island Arc (C) ∧ Arc-Command (B,C) ∧ Arc-Command (C,A) → Neighbor (B,C)

According to this law, an island effect obtains if some proper-overlay-arc B connected to a starter A arc-commands an island arc C that does not arc-command B as well. And although there is an Island-arc in (217) not arc-commanding some proper-overlay-arc, this does not result in an island violation *because there is no proper-overlay-arc to start with*.
What needs to be guaranteed under the extended approach to extraction employing trigger arcs is the connection between the trigger and the proper-overlay-arc. More specifically, it has to be assured that the proper-overlay-arc appears within the domain defined by the tail and the head of the trigger arc. Otherwise, wh-question extraction would target a position that is outside the domain for interrogativity, resulting in sentences such as (219), where the wh-phrase moves outside the embedded interrogative clause.

(219)* Who does John wonder Mary likes.

The following law specifies the connection between proper-overlay-arcs and targets.

(220) *The Trigger Proper-Overlay-Arc Connection Law*
       Starter (A,B) ∧ Target (C,D) ∧ R-Sponsor (C,A) → Arc-Command (D,B)

This law guarantees that the proper-overlay-arc B to which the starter A belongs are arc-commanded by the trigger arc D which itself belongs to the target arc C; the condition that C R-sponsors A assures that the target arc is the one identified by the Starter-Target Law; it excludes therefore cases in which target and starter belong to different extraction. Consider for example the structure in (207). There, the trigger arc labeled 'Int' arc-commands the proper-overlay-arc labeled 'WH'. The Trigger Proper-Overlay-Arc Connection Law would also be satisfied if the WH-arc appeared lower in the structure than the Int-arc, as shown in (222) for the sentence in (221)

(221)* Du   glaubst wen sie t liebt?
       you believe who she loves
       Who do you think she loves?

(222)
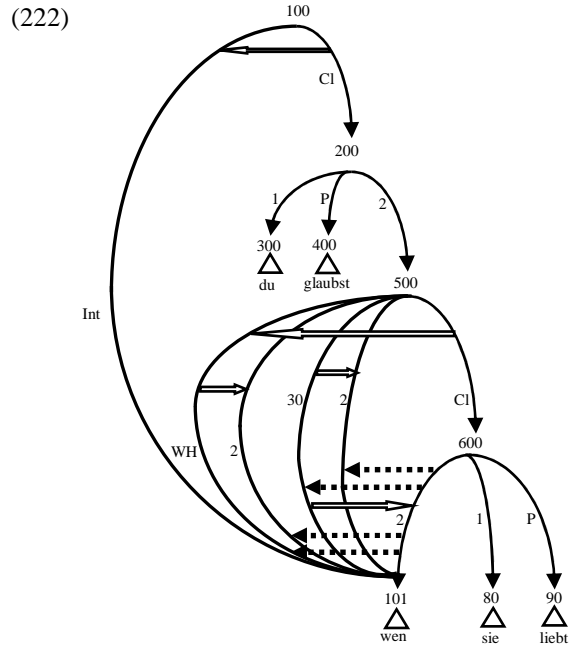
The reason the structure in (222) is compatible with the Trigger Proper-Overlay-Arc Connection Law follows from the definition of arc-command: an arc A arc-commands another arc B iff A's tail node R-governs B's tail node. This is the case in (222) because the Int-arc's tail node, the node labeled '100', R-governs the WH-arc's tail node, the node labeled '500'. Since R-govern is a reflexive relation, an arc A arc-commands all its neighboring arcs, that is, all arcs that have the same tail node. For this reason, the structure in (207) is well-formed as well: the Int-arc's tail node is identical to the WH-arc's tail node, viz. to the node labeled '100'. In order to capture the ungrammaticality of (221), the structure corresponding to it in (222) needs to be excluded. I assume that this is due to a rule at work in German and certainly many other languages, formulated in (223).

(223) *German Extraction Rule*
       Starter (A,B) ∧ Target (C,D) ∧ R-Sponsor (C,A) → Neighbor (D,B)

Since neighborhood is a special case of arc-command, this rule is compatible with the Trigger Proper-Overlay-Arc Connection Law. The German extraction rule excludes the structure in (222) because the Int- and the WH-arc are not neighbors, whereas it includes the structure in (207) because there the Int-arc and the WH-arc are neighbors.

The liberal formulation of the Trigger Proper-Overlay-Arc Connection Law might strike one as unwelcome, but it allows a straightforward treatment of a peculiar extraction construction, viz. *partial movement*. By this, one refers to a situation where an element is extracted, but not to its target position but only to some

intermediate position (cf. Fanselow 2006). The phenomenon is illustrated in (224) with data from Babine-Witsuwit'en and in (225) with data from Albanian.

(224) a. **Ndïtnï book** George [s Lillian yik'iyelhdic] yilhnï?
            which book George   Lillian read   told
       b. George [s **ndïtnï book** Lillian yik'iyelhdic] yilhnï?
            George   which book Lillian read   told
            Which book did George tell Lillian to read?

                                                    (Denham 2000, ex. 18c & ex. 18b)

(225) a. **Kë** mendon [s se   Maria ka takuar t]?
            who think.you   that Maria has met
       b. A mendon [s se   **kë**   ka takuar Maria t]?
            Q think.you   that who has met   Maria
            Who do you believe Mary has met?

                                                    (Turano 1998, ex. 35a & ex. 36)

The a-examples illustrate *full movement*, that is, extraction to the target position, the b-examples *partial movement*, in this case to the embedded clause initial position. The 'partiality' of this extraction is enforced by the fact that the a- and b-examples have the same meaning. In both Albanian and Babine-Witsuwit'en the German rule in (223) is not at work, but only the Trigger Proper-Overlay-Arc Connection Law. This allows the proper-overlay-arc to be a neighbor of the trigger arc but doesn't require it. The structure for the Albanian example (225b) is given in (226).

(226)
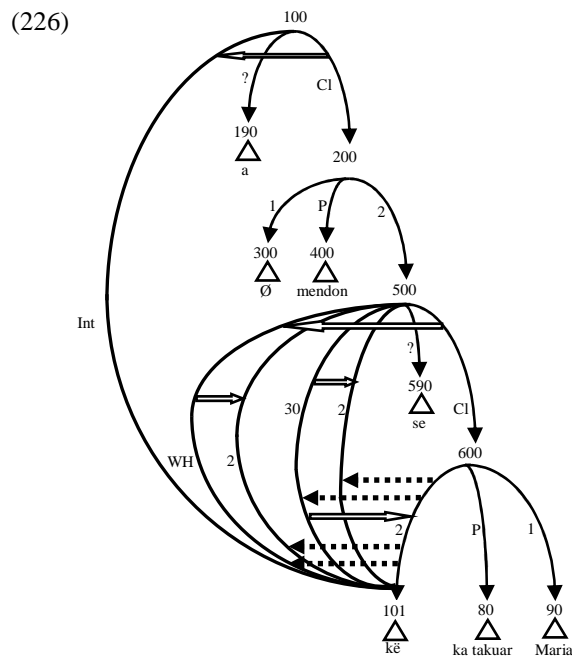
This structure also captures that the extracted element is interpreted in a position not corresponding to its surface position, for it is the trigger arc that is semantically relevant, and this arc appears in the target position.

Analyzing partial movement along these lines, that is, as reflecting the general case, has the advantage that one can immediately account for the generalization stated in (227), originally due to Fanselow 2006, p. 441.

(227) *The Partial Movement Full Movement Generalization*
       If a language tolerates partial movement, it also tolerates full movement.

The generalization follows because both partial movement and full movement involve the same relevant substructure, viz. 30-arcs that are successors-I. The only difference between partial movement and full movement is the position of the proper-overlay-arc; but this difference follows from the Trigger Proper-Overlay-Arc Connection Law.

Another benefit is that since the law actually only restricts the cases where a starter and a target are present, it is silent about those cases where only a target is present. In other words, the law doesn't establish any link between the existence of partial movement and *wh in situ*. And although Fanselow 2006 claims (p. 441) that all languages with partial movement also have *wh in situ*, this is in fact not the case: Babine-Witsuwit'en does have *wh in situ*, whereas Albanian does not.

(228) a. George [$_S$ Lillian **ndïtnï book** yik'iyelhdic] yilhnï?
           George   Lillian which book read   told
           Which book did George tell Lillian to read?

                                                           (Denham 2000, ex. 18a)

       b.* Mendon [$_S$ se   Maria ka takuar **kë**]?
           think.you   that Maria has met   who
           Who do you believe Mary has met?

                                                           (Turano 1998, ex. 35b)

An alternative analysis to the one just presented would have it that all languages are in fact subject to the rule in (223) requiring neighborhood between a trigger and a proper-overlay-arc, and that partial movement is actually full movement in disguise. What I mean by this is that partial movement actually is full movement but that the highest 30-arc is erased by some lower one. The corresponding alternative structure for the Albanian partial movement example (225b) would then look as in (229).

(229)
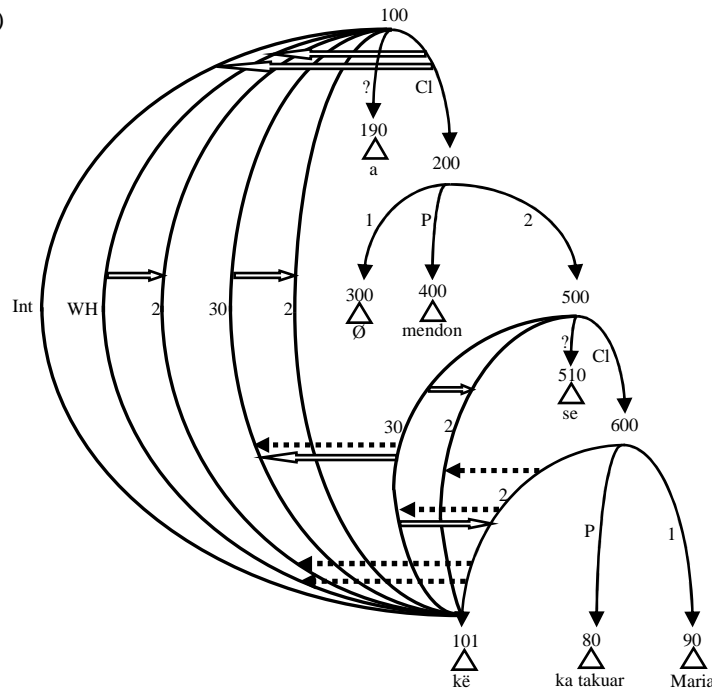
Although this would involve an unwelcome complication of the rules that specify sponsorship between 30-arcs, this complication is not the reason to dismiss this alternative. The real reason to dismiss it is that this structure predicts effects of intermediate relations all the way up to the scope position. However, those languages that both (i) possess partial movement and (ii) reflect the presence of intermediate relations show such effects only up to the position where the (partially) extracted element appears. Palauan is such a language: it has both partial movement and wh-agreement. Wh-agreement however does not extend beyond the surface position of the extracted element, as the following examples show.

(230) a. <u>Ngte'a</u> a **l**-oumerang [s el **d**-omdasu   [s e   Ø-mo er a siabal t]]?
           who   ? 3.S.IR-believe that 1.PL.S.IR-think   that R.go P ? Japan
       b. *T*-oumerang   [s el *ked*-omdasu [s e   <u>ngte'a</u> a Ø-mo er a siabal]]?
           3.PL.S.R-believe   that 1.PL.S.R-think   that who   ? R.go P ? Japan
           Who do they believe that we think will go to Japan?
                                                      (Georgopoulos 1991, ex. 54c & ex. 54a)

In (230a), the extracted element (<u>underlined</u> in both examples) is extracted up to the sentence initial position, and wh-agreement effects show up on all intermediate verbs (set in **bold** in both examples). In (230b), however, wh-agreement only targets the verb of the clause internal to which the extracted element is partially moved; in the higher clauses, regular agreement morphology surfaces (set in *italics*). If these structures only differed with respect to whether the higher 30-arc erases the lower

one or vice versa, then wh-agreement would not be affected by this. But it is affected, indicating quite strongly that the analysis presented here based on the idea that partial movement is indeed partial extraction is superior to the alternative according to which partial movement is full movement in disguise.

I should stress here that Palauan is not idiosyncratic with respect to the differences between the effects of wh-agreement in partial movement structures. Malay is similar to Palauan in both allowing partial movement and showing wh-agreement effects, viz. the deletion of the verbal prefix *meng*. Consider the examples in (231).

(231) a. **Siapa** Bill (*mem-)beritahu ibunya   [$_S$ yang t (men-)yintai Fatimah]?
           who Bill (MENG)tells   mother.his   that   (MENG)love Fatimah
           Who does Bill tell his mother loves Fatimah?
       b. Ali (mem)-beritahu kamu tadi   [$_S$ **apa** yang Fatimah (*mem)-baca t]?
           Ali (MENG)-told   you just.now   what that Fatimah (MENG)-read
           What did Ali tell you just now that Fatimah was reading?
                                          (Cole & Hermon 1998, ex. 27a & ex. 41)

In (231a) a subject is extracted out of an embedded object clause. And since subjects don't trigger the obligatory deletion of *meng*, this prefix can be retained internal to the object clause in (231a). However, in the matrix clause, the deletion of the prefix is obligatory because the extracted subject behaves there as an extracted object, and these require deletion of *meng*. (231a) contrasts with (231b), which contains a partially moved object originating in an object clause. Internal to the embedded object clause, the prefix deletes obligatorily because an object is extracted and extracted objects require the deletion of *meng*. In the matrix clause, on the other hand, the prefix can appear. If that clause contained a covert instance of the extracted element *apa*, then the prefix on the matrix verb would also be expected to be deleted. This is so because *apa* behaves as an extracted object, which requires the deletion of *meng*. But as can be observed, the prefix can be retained. This follows trivially from the analysis for partial movement presented here because the matrix clause contains no overt instance of the extracted element and so no effect of this element is possible.

Before closing this discussion, I mention a small problem posed by partial movement in connection with the Island Law. The Island Law was formulated with respect to the domain spanned by the starter and its proper-overlay-arc such that this domain must not contain an island arc unless it is a neighbor of the proper-overlay-arc. For partial movement, this creates the problem that it is sensitive to islands that appear as neighbors of the proper-overlay-arc. Consider the following examples from Malay.

(232) a.* **Apa** (yang) Ali dipecat   [$_S$ kerana dia beli   t]?
            what (that) Ali was.fired   because he bought
       b.* Ali dipecat   [$_S$ **apa** (yang) kerana dia beli   t]?
            Ali was.fired   what (that) because he bought
            What was Ali was fired because he bought?
                                          (Cole & Hermon 1998, ex. 9 & ex. 37)

The ungrammaticality of (232a) is not surprising, but that of (232b) is: the element *apa* was extracted only internal to the adverbial clause. Given the analysis of partial movement developed so far, the proper-overlay-arc is a neighbor of the island arc whose support is the Adv-arc. And although it therefore obeys the Island Law, the sentence is ungrammatical. But the Island Law can be easily reformulated in such a way as to incorporate these facts, that is, without loosing the account for the ungrammaticality of the cases covered so far. More specifically, I propose the following reformulation.

(233) *The Island Law (Final Version)*
       Starter-Target (A,B) ∧ Island Arc (C) ∧ Arc-Command (B,C) ∧ Arc-command (C,A) → Neighbor (B,C)

This law simply requires neighborhood between the trigger instead of the proper-overlay-arc. This accounts for the ungrammaticality of (232b): the trigger arc is after all in the highest clause in (232b), but the island arc is not a neighbor of this arc. The revised Island Law is still compatible with the island insensitivity of *wh in situ* in Malay and Bahasa Indonesian because it is only defined for starter-targets and not for targets in general; only the latter ones are present in this type of *wh in situ* and are therefore not subject to the revised Island Law. A further benefit of this reformulation of the Island Law is that it captures a paradoxical property of partial movement, viz. that it triggers island effects for some element x, even if x never 'left' the relevant island. As an illustration of this effect, consider the following sentence from Malay.

(234)* Kamu sayang perempuan [s yang Ali fikir [s **apa** yang telah   makan t]]?
       you   love   woman   that Ali thinks what that   already eat
       What do you love the woman who Ali thinks ate?
                                                          (Cole & Hermon 1998, ex. 35b)

Here, the island appears *outside* of the domain in which overt extraction occurs: the extraction of *apa* occurs internal to a clause that is only part of the relative clause, but not the relative clause itself, and that therefore is not an island. That this clause itself is not an island is suggested by the fact that extraction of the (invisible) relative proform was possible in the first place. The revised version of the Island Law accounts immediately for the ungrammaticality of this sentence. The trigger is located in the highest clause, as suggested by the interpretation of this sentence. Importantly, the domain between the trigger and its starter-target contains an island arc. The support of this island arc is the arc corresponding to the relative clause, that is, the Cl-arc of most deeply embedded clause. This island arc is however *not* a neighbor of the trigger arc, thereby violating the revised version of the Island Law. Malay is not exceptional in this respect. As discussed in Pankau 2007, pp. 58-9, partial movement in relative clauses in German behaves identically. Some speakers

of German allow both *in situ* relativization[57] and and a partial movement strategy for relative clauses.

(235) a. Ich kenne den Mann [$_S$ wo du   glaubst [$_S$ dass Maria **ihn** liebt]].
           I   know the man   REL you believe   that Maria him loves
       b. Ich kenne den Mann [$_S$ wo du   glaubst [$_S$ **den** Maria t liebt]].
           I   know the man   REL you believe   him Maria   loves
           I know the man who you believe Mary loves

The two constructions differ with respect to island sensitivity: whereas the *in situ* strategy is insensitive to islands, the partial movement strategy is sensitive to islands, even though the islands are not crossed by the overt movement of the pronoun. This illustrated in (236) & (237) for the Complex NP island and the subject island, respectively.

(236) a. $^\sqrt{}$ Ich kenne die Frau [$_S$ wo Peter den Verdacht hat [$_S$ dass **sie** schuldig ist]].
           I   know the woman REL Peter the suspicion has   that she guilty   is
       b.* Ich kenne die Frau [$_S$ wo Peter den Verdacht hat [$_S$ **die** t schuldig ist]].
           I   know the woman REL Peter the suspicion has   she guilty   is
       c.* Ich kenne die Frau [$_S$ wo Peter den Verdacht hat [$_S$ **die** ist t schuldig]].
           I   know the woman REL Peter the suspicion has   she is   guilty
           I know the woman who Peter suspects is guilty.

(237) a. $^\sqrt{}$ Ich kenne den Mann [$_S$ wo dir aufgefallen ist [$_S$ dass **er** drei Arme hat]].
           I   know the man   REL you apparent   is   that he three arms has
       b.* Ich kenne den Mann [$_S$ wo dir aufgefallen ist [$_S$ **der** t drei Arme hat]].
           I   know the man   REL you apparent   is   he   three arms has
       c.* Ich kenne den Mann [$_S$ wo dir aufgefallen ist [$_S$ **der** hat t drei Arme]].[58]
           I   know the man   REL you apparent   is   he   has   three arms
           I know the man who you noticed has three arms.

The ungrammaticality of these examples follows from the same reason as the ungrammaticality of the Malay example: the domain between the trigger and its starter-target contains an island arc.

---

[57] For reasons unclear to me, the *in situ* strategy for these speakers is restricted to contexts of relativization into embedded clauses.
(i) a. *Ich kenne den Mann [$_S$ wo   du (ihn) liebst].
              I   know the man   REL you him love
     b. Ich kenne den Mann [$_S$ den du t liebst].
         I know the man who you love.
[58] The grammaticality of (i) indicates that the ungrammaticality of (237c) is not due to verb second order.
(i) a. [$_S$ Der Mann hat drei Arme] ist mir aufgefallen.
              the man   has three arms   is me apparent
     b. Mir ist aufgefallen [$_S$ der Mann hat drei Arme].
         me is apparent   the man   has three arms
         I noticed that the man had three arms.

7.3.5   Summary

In this section, I have shown that an APG account of extraction based on 30-arcs and relational markers provides the means to analyze data different from wh-copying. 30-arcs allow one to analyze successive cylicity effects as reflexes of the mere presence of a 30-arc. *Type 1 in situ* languages, where covert extraction respects islands, are due to the erasure properties of 30-arcs. Relational markers offer analyses for a number of seemingly disparate phenomena in a unified manner. These include extractions where only a subset of extracted elements triggers successive cyclicity effects and those where the effect of an extracted element within a sentence varies from clause to clause. The former type of extraction is an effect of rules that take the relational markers accompanying 30-arcs into account, whereas the latter type of extraction reflects sensitivity to relational markers and the variability with respect to the sponsoring properties of relational markers. Finally, I have shown how to supplement my APG treatment in such a way as to account for the semantic impact extractions have. A side effect of that treatment was that the properties of partial movement constructions could be captured, as well as those of *type 2 in situ* languages, that is those where covert extractions do not respect islands[59].

7.4   Benefits of the APG Treatment of Case Affixes and Adpositions

7.4.1   Introduction

The previous sections exclusively dealt with benefits that were made possible by my APG analyses. And although I deal with benefits in this section as well (cf. section 4.3), the focus is to provide justification for an important aspect of my APG analysis for case affixes and adposition, viz. for the claim that case affixes and adposition are *equivalent*. Providing such justification for this claim is necessary in my view for two reasons. First, the idea of treating case affixes and adpositions in a unified manner has been explicitly argued against in the literature (cf. Jackendoff 1973, Riemsdijk 1978). And second, APG was directly criticized because it assumes a unified account for both case affixes and adpositions without providing any

---

[59] What I have left out here but what should be accounted for additionally by a complete APG account of extraction are (i) interwoven dependencies (cf. Postal 1998; Zhang 2007), (ii) conjoined wh-phrases (cf. Tomaszewicz 2011), (iii) multiple wh-extraction (found in many Slavonic languages, cf. Blaszczak & Fischer 2001 for an overview), (iv) the absence of multiple wh-extraction in languages like English and German, and (v) and the absence of multiple wh-questions in languages such like Italian and Irish (cf. Calabrese 1984 on Italian, and McCloskey 1979 on Irish). The fourth phenomenon poses serious problems for my analysis because the *in situ* wh-phrases are island sensitive (cf. Postal 1998, pp. 72-4).

motivation for this assumption (cf. Lapointe 1993, fn. 6). I aim to provide this motivation, refuting the conclusions by Jackendoff 1973 and Riemsdijk 1978.

The remainder of this section is organized as follows. In section 4.2, I show that case affixes and adpositions are in fact equivalent. In section 4.3, I discuss a benefit of the specific analysis developed in section 7 of chapter 6, viz. a benefit of the Closure Law. Finally, in section 4.4, I deal with some problems the analysis for case and adpositional marking faces and discuss some ways to handle them.

7.4.2   The Equivalence of Case Affixes and Adpositions

This section demonstrates that case affixes and adpositions are crosslinguistically equivalent, that is, they show identical behavior. In other words, whatever property a case affix has, adpositions have the same property, and vice versa. More specifically, I demonstrate that they are *functionally*, *distributionally*, ands *selectionally* equivalent, and that they are able to trigger the same *agreement effects*.

7.4.2.1   Functional Equivalence

By *functional equivalence*, I mean that case affixes and adpositions are able to mark the same set of grammatical relations. So, whatever relation can be marked by case can also be marked by an adposition, and vice versa[60]. The functional equivalence holding between case affixes and adpositions has in fact already been pointed out by Zwicky 1992, on whose material I partially draw here.

First, what is expressed by a PP in a language like English is often expressed by a case marked NP in other languages. For example, in passives, the original subject is demoted to a relation dubbed chômeur in RG and APG. Whereas the chômeur surfaces as a PP in English, German, or Dutch, it surfaces as a case marked NP in Russian, Sanskrit, or Lithuanian, as (238) and (239) respectively illustrate.

(238) a   Peter wurde   **von Maria** geschlagen.
          Peter became from Maria hit
          Peter was hit by Maria.

---

[60] I should stress here that the idea of assigning case affixes and adpositions to one class is not an innovation of APG but has both past and contemporary precursors. The earliest representative known to me is Pietro Bembo, as reported in Robins 1967, p. 101, according to whom prepositions such as French *de* and Italian *di*, as in *padrone di casa*, are *segni di case*, case signs. The idea was also explicitly expressed in the *Grammaire du Port Royal*:, in which one reads that "les Cas et les Prepositions avoient esté inventez pour le même usage, qui est de marquer les rapports que les choses ont les unes aux autres" [The cases and the prepositions were invented for the same use, which is to mark the relations that the things bear to one another]. The most well-known recent proposals that treat prepositions and case affixes identical are the one by Fillmore 1968 and Emonds 1985. Fillmore states that "the discussion of case could be seen in a somewhat better perspective if the assignment of case forms were viewed as exactly analogous to the rules for assigning prepositions" (Fillmore 1968, p. 15).

      b. Piet wordt **door**   **Marie** geslagen.
           Piet was   through Marie hit
           Piet was hit by Marie.

(239) a. On byl ubit' **russkimi**   **soldatomi**[61].
            he was killed russian.INSTR soldiers.INSTR
            He was killed by Russian soldiers.
      b. **Rāme̱na**   kathā pa̱thyate.
            Rama.INSTR story is.read
            A story is read by Rama.

                                             (Lehmann 2011, p. 111)

      c. Nãmas yrà **màno**   stãtomas.
            house is   me.GEN built
            The house is built by me.

                                      (Eckert et al. 1994, p. 194)

In the examples in (238), the chômeur surfaces as PP headed by an adposition appropriate for the relevant language. As the examples in (239) show, the chômeur relation can also be expressed by case marking. Similar to the marking by adpositions, the form of the case affix is determined by language particular rules: in both Sanskrit and Russian, it is marked by instrumental case, whereas it is marked by genitive case in Lithuanian. More familiar examples of the equivalence between case affixes and adpositions come from languages in which *spatial* relations of all kinds, typically expressed by PPs in most Indo-Germanic languages, are expressed via cases. Such languages include Latvian and Turkish.

(240) a. Juris dzīvo **Rīgā**.
           Juris lives Riga.LOC
           Juris lives in Riga.

                                   (Holst 2001, p. 207)

      b. Hasan **üniversite-de**   okuyor.
            Hasan university-LOC   studies
            Hasan studies at the university.

                                (Kornfilt 1997, p. 242)

      c. Hasan **Ankara-dan** geldi.
            Hasan Ankara-ABL   came
            Hasan is from Ankara.

                                  (Kornfilt 1997, p. 243)

Latvian is exceptional among the modern Indo-Germanic languages in that it has preserved a separate case that marks location[62]. In addition to the locative, Turkish

---

[61] The Russian example was kindly provided by Pavel Logačev (p.c., 2012/05/11).
[62] This statement seems to fly in the face of many traditional descriptions that speak of a locative case in the East and West Slavonic language. However, these cases never appear free-standing and their locative interpretation is only provided by accompanying prepositions.

has also a true[63] ablative, marking motion away from some place. As is well-known (Hjelmslev 1972), languages differ with respect to the number of spatial cases they possess, ranging from one, as in Latvian, over four, as in Lithuanian, to nine, as in Hungarian[64]. The Lithuanian and Hungarian spatial case systems are illustrated in (241) and (242).

(241)   System of local cases in Lithuanian

	IN	**AT**
Place	*Inessive*	*Adessive*
Direction	*Illative*	*Allative*

	IN	**AT**
Place	mišk**è** *in the forest*	mišk**iẽp** *at the forest*
Direction	mišk**añ** *into the forest*	mišk**óp** *to the forest*

(adapted from Eckert et al. 1994, p. 114)

(242)   System of local cases in Hungarian

	IN	**AT**	**ON**
Place	*Inessive*	*Adessive*	*Superessive*
Direction	*Illative*	*Allative*	*Sublative*
Source	*Elative*	*Ablative*	*Delative*

	IN	**AT**	**ON**
Place	ház**ban** *in the house*	ház**nál** *at the house*	ház**on** *on the house*
Direction	ház**ba** *into the house*	ház**hoz** *to the house*	ház**ra** *onto the house*
Source	ház**ból** *out of the house*	ház**tól** *from the house*	ház**ról** *off the house*

(adapted from Rounds 2001, p. 100)

Less familiar it seems is the use of cases markers for non-local relations; an incomplete list plus illustrations is given in table 4.

---

[63] In contrast to Latin, for example, where the traditional name ablative for one of the six cases is rather inappropriate because this case is used in this function only together with prepositions such as *a*, ex, or *de*; the term 'instrumental' seems better suited for this case (cf. Blake 2001, p. 6).
[64] Many Northeast Caucasian languages have even richer systems of spatial relations expressed by suffixes (Hjelmslev 1972). It is however unclear whether they therefore have richer case systems because the suffixes can be combined with each other, for example in Tsez (Comrie & Polinsky 1998) or Lezgian (Haspelmath 1993), leading to paradigms with up to 56 slots, as in the case of Tsez. But most slots are not occupied by a distinct case suffix, but rather by a combination of two or three case suffixes.

Case	Function	Language	Example
Predicative	temporary state	Finnish	Olen täällä opettaja**na**. I.am here teacher.PRD *I am here as a teacher*
Translative	change of state	Finnish	Hän tuli isä**ksi**. he came father.TRS *He became father.*
Instrumental	instrument	Old High German	Nu scal mih suasat chind suert**u** hauwan. now shall me sweet child sword.INSTR beat *Now my sweet child will kill me with the sword.*
Abessive	lack	Finnish	rahatta money.ABES *without money*
Benefactive	beneficient	Basque	Liburu hori haur**rentzat** idatzi nuen. book that children.BEN written I.have *I have written this book for the children.*
Temporal	point in time	Hungarian	Húsvet**kór** született. Easter.TEMP he.was.born *He was born at Easter.*
Comitative	accompaniment	Hungarian	János**sal** kisétáltunk a tóhoz. Janos.COM we.walked the lake.ALL *We walked to the lake with Janos.*

Table 4: a potpourri of adverbial, non-local cases

The cases illustrated so far have in common that they express *adverbial* relations, that is, they mark the function of an element whose presence is not required by the valency of the predicate; this is why such cases are also called adverbial or semantic cases (cf. Blake 2001, p. 31). However, and this is the second point, adpositions can also be used to mark grammatical relations that are normally marked by cases in most Indo-Germanic languages. More specifically, they can be used to mark *arguments*, that is, elements whose presence *is* required by the valency of the predicate. Languages having such a use of adpositions include Japanese, Niuean, Shokleng, and Khasi.

(243) a. Taro **ga** Hanako **ni** hon **o** yat-ta.
Taro NOM Hanako DAT book ACC give-PAST
Taro gave a book to Hanako.

(Shibatani 1977, p. 790)

b. Ne fakahū **e** au **e** tohi **kehe** kapitiga haaku.
PAST send ERG I ABS letter dat friend my
I sent a letter to my friend.

(Seiter 1983, p. 319)

c. Tã **wũ** ti penũ mũ.
he NOM he shoot active
He shot him.

(Urban 1985, p. 166)

d. Ka la yo''ii **ya** 'u khlaa.
she PAST see ACC the tiger
She saw the tiger.

(Bittner & Hale 1996, p. 4)

Japanese and Niuean are similar in that all functions are marked by adpositions, they only differ with respect to the headedness: Japanese is head final, hence it has postpositions, Niuean is head initial, so it has prepositions (the homophony between the ergative and the absolutive marker is accidental in this example, cf. Seiter 1983, p. 320). Shokleng and Khasi also differ with respect to this issue, but Shokleng is additionally peculiar because it belongs to the type of 'marked-nominative' languages (cf. König 2009 for an overview), in which the citation form of a noun is formally identical to the accusative and not the nominative, as in the majority of languages.

In sum, the functional similarity between case affixes and adpositions goes in either direction, when viewed from an Indo-Germanic perspective: adpositions can be used to mark relations that are usually marked by cases in the Indo-Germanic languages, and case affixes can be used to mark relations that are usually marked by adpositions in the Indo-Germanic languages. Hence, cross-linguistically, it is justified to group case affixes and adpositions together under a single category.

7.4.2.2 Distributional Equivalence

Apart from the functional equivalence between case affixes and adpositions, it is also the case that they are *distributionally equivalent*. By that I refer to the observation that both case affixes and adpositions can appear in the same types of position. In other words, whatever position a case affix can occupy, it can also be occupied by an adposition, and vice versa.

First, it is well-known that adpositions divide into prepositions, postpositions, and circumpositions, that is, they can precede the noun they belong to, follow it, or surround it. These options are each illustrated in (244) with German examples.

(244) a. Ich tanze **mit** dem Mann.
        I dance with the man.
  b. dem Bericht **zufolge**
     the report according
     according to the report
  c. **von** jetz **an**
     from now on

Case affixes equally divide up into suffixes, prefixes, and circumfixes. The first option is well-known since it is instantiated in all Indo European languages with case marking (for example in Latin and Greek). Prefixal and circumfixal case marking on the other hand are rare, but attested. Prefixal case marking is illustrated in (245) with data reported in WALS, chapter 51.

(245) a. wakaboola **a**-Joni   [Tonga]
     he.came   COM-John
     He came along with John.

  b. **burr**-wupunj awurrbogini   [Gurr-goni]
   INSTR-canoe   they.all.went
   They all went by canoe.
  c. ičča **u**-ryaz   aksum   [Middle Atlas Berber]
   ate   NOM-man   meat
   The man has eaten the meat.
  d. ɛsl'ɛk   **tu**-g'ul   [Prasuni]
   that   LOC-country
   in that country
  e. **gwel**-danà   [Takelma]
   SUBESS-rock
   under the rock

Blake 2004, p. 1080, mentions other languages with prefixal case marking, one of
which is Nungali where the prefixes not only indicate case but also noun class. That
is also typical for case suffixes in inflectional languages like Latin where the case
suffix also expresses gender.

Noun Class	Absolutive	Oblique	Translation
1	***di-gal***	***nyi-gal***	'water'
2	***nya-ngarrung***	***ganyi-ngarrung***	'woman'
3	***nu-ngulud***	***nyu-ngulud***	'camp'
4	***ma-yadayn***	***nyi-yadayn***	'skin'

Table 5: prefixal case marking in Nungali

Circumfixal case marking is even rarer, but it is attested in the Chukotko-
Kamchatkan languages (Mel'čuk 2006, p. 140), as illustrated here with two
members of that language group, viz. Itelmen (cf. (246)) and Chukchee (cf. table 6),
where comitatives are marked by circumfixes.

(246) a. P'eç **k'**-iplxe-**ļ**   k'oļ-en.
   boy   COM1>-friend-<COM1   come-3.SG
   The boy came with the friend.
  b. Ipļh-e,   ən'çe-ʔn   q-sol'a-s-xiʔn   **k**-xewli-**çom**.
   friend-VOC   fish-PL   IMP.2-salt-PRS-2.SG:3.PL   COM2>-head-<COM2
   Friend, salt the fishes along with their heads.
         (Georg & Volodin 1999, chapter 3, ex. 65 & ex. 71)

	Stem	Comitative 1	Comitative 2
'nomad'	*čawčəw*	*γa-čawčəw-**ta***	*γa-čawčw-**ma***
'friend'	*tumγ*	*γe-tumγ-**e***	*γa-tumγ-**ma***
'polar bear'	*umqə*	*γ-umqə-**te***	*γ-umqə-**ma***
'hunting gun'	*milγer*	*γe-milγer-**e***	*γa-milγer-**ma***

Table 6: circumfixal case marking in Chuckhee

                (Mel'čuk 2006, p. 140)

As the example (246) illustrates, each comitative is marked by a circumfix, viz. by *k- -ļ* (comitatve 1), and by *k- -çom* (comitative 2); the difference between the two comitatives is that the comitative 2 marks elements that naturally belong to the noun they accompany (Georg & Volodin 1999, p. 85).

Second, both case affixes and adpositions can target phrases and heads. Although case affixes target heads in Indo European languages, viz. nouns, this is not a necessary property of case affixes. For there are languages where case affixes target the phrase. One such language is English, where the possessive is a phrasal affix.

(247) a. [The man over there]'**s** beard is pretty unusual.
      b. That's [[the man you were talking about]'**s** brother]'**s** dog.
      c. The boy was apparently Burton's and [the woman he choked-out]'**s** son[65].

Georgian and Turkish also feature phrasal affixes, Turkish even quite generally; in the Turkish example (248b), not only does the case suffix attach to the whole phrase, but so do the plural suffix and the possessive suffix[66].

(248) a. Vin   cxovrobs [$_{NP}$ am-**Ø**   lama-**z**   džvel-**Ø** saxl-(**s**)]-**ši**?[67]
           who.NOM lives   that-DAT beautiful-DAT old-DAT house-(DAT)-LOC
           Who lives in that beautiful old house?
                                      (Abuladze & Ludden 2006, p. 186))
      b. [$_{NP}$ Vazo ve heykel]-ler-im-**i**   sat-tı-m.
           vase and statue-PL-l.SG-ACC sell-PAST-l.SG
           I sold my vases and statues.
                                        (Kornfilt 1997, p. 122)

Another language with phrasal affixes is Basque, as illustrated in (249).

(249) a. [$_{NP}$ Ijito   aberats hone]-**k** [$_{NP}$ arrosa eder   hau]-**ek**
           gypsy rich   this-ERG   rose   beautiful this-PL
           [$_{NP}$ neskatxa polit horr]-**entzat** dakartza.
           girl   pretty that-BEN   brings
           This rich gypsy is bringing these beautiful roses for that pretty girl.
                                (de Rijk 2008, p. 208 & p. 1046)
      b. [$_{NP}$ Mikolas eta Erromana]-**k**   [$_{NP}$ etxe   eta seme-alab-(e)]-**ekin**
           Mikolas and Romana-ERG   house and son-daughter-(PL)-SOC
           nahikoa arazo   zerabilten.
           plenty   problem handled
           Mikolas and Romana had plenty of worries with the house and the children.
                                (de Rijk 2008, p. 221 & p. 1047)

---

[65] blogs.browardpalmbeach.com/pulp/2013/02/florida_mans_son_tells_cops_th.php. Thanks to Pavel Logačev for providing me with this example (p.c., 2013/03/04).
[66] Treating these phrasal affixes as postpositions is impossible because in contrast to real postpositions in Turkish, these affixes are subject to vowel harmony.
[67] The locative suffix triggers no agreement contrary to the dative suffix, which appears on every subsonstituent of the locative marked constituent. The dative suffix on the noun *saxl* is put in parenthesis because it assimilates to the initial consonant of the locative suffix *–ši*.

The examples in (249) are not amenable to a view that nouns and adjectives cannot carry case affixes, because they can, as the examples in (250) show.

(250) a. [NP Gizon bate]-**k**   bazituen bi   seme.
             man one-ERG had   two son
             A certain man had two sons.

                                                     (de Rijk 2008, p. 220 & p. 1046)

       b. Hone-**k**   hau-ek horr-**emtzat** dakartza
           this-ERG this-PL that-BEN   brings
           This one is bringing these for that one.

                                                     (de Rijk 2008, p. 208 & p. 1046)

       c. Gizona-**k** ereinotzusaia zeraman.
           man-ERG   laurel.smell   carried
           The man carried a laurel smell.

                                                     (de Rijk 2008, p. 221 & p. 1047)

Example (250a) shows that adjectives can bear case suffixes; and (250b) and (250c) show that for determiners nouns, respectively. In addition to this, not only the ergative case affix is a phrasal affixes. All case affixes are: (249a) shows this for the benefactive case suffix, and (249b) for the sociative marker. More examples illustrating this point are given in (251): (251a) and (251b) illustrate this for the locative case affix, (251c) illustrates it for the allative and the ablative marker, and (251d) does so for the instrumental marker.

(251) a. [NP Egipto guzti]-**an** inor-**k**   ere, bata bestea ez   zuen ikusten.
             Egypt all-LOC   anybody-ERG too one other not AUX see
             In the whole of Egypt, nobody could see each other.

                                                     (de Rijk 2008, p. 371 & p. 1081)

       b. [NP Solas   luze-e-ta]-**n**   ez da   faltako   sin.
             conversation long-PL-IDF-LOC not AUX will.lack sin
             In long conversations sin won't be lacking.

                                                     (de Rijk 2008, p. 322 & p. 1066)

       c. [NP Mila   kilometro-ta]-**ra**   geunden [NP bata bestea]-**rengandik.**
             thousand kilometer-IDF-ALL we.were   one other-ABL
             We were a thousand kilometers from each other.

                                                     (de Rijk 2008, p. 371 & p. 1081)

       d. [NP Gorroto bizi]-**z**   gorroto izan ditut.
             hatred   intense-INSTR hatred had I.had
             I have hated them with intense hatred.

                                                     (de Rijk 2008, p. 319 & p. 1065)

The reverse case is also instantiated, viz. that adpositions don't target a phrase but the head noun. Although rare, WALS mentions one language, Tümpisa Shoshone.

(252) [NP ohipim   **ma** natii'iwantü-nna] tiyaitaiha satü.
          cold.OBJ **from** mean-OBJ   died   that
          He died from a mean cold.

                                                     (WALS, chapter 85, ex. 5)

In this example (and in Tümpisa Shoshone in general), the adposition has to appear immediately after the head noun of the whole constituent, viz. *cold*, but before all modifiers.

Thirdly, and finally, case affixes and adpositions share the property of not being restricted to nominal constituents. More specifically, each of them can appear on adverbs and clauses. One language where adpositions can mark adverbs is German, as illustrated in (253).

(253) a. **seit** gestern
           since yesterday
       b. **seit** dem   Anfang   des   Universums
           since the.DAT beginning the.GEN universe.GEN
           since the beginning of the universe
       c. **ab** morgen
           off tomorrow
           from tomorrow on
       d. **ab** dem   nächsten Monat
           off the.DAT next   month
           from next month on
       e. **von** hier
           from here
       f. **von** dieser   Stelle
           from this.DAT position
           from this position

A language where case affixes appear on adverbs is Udmurt. Udmurt has seven local cases, listed in (254) with their respective case affixes, and five adverbs, enumerated in (255) with their basic meaning.

(254) Inessive (where?):   *-in*
       Illative (where to?):   *-e*
       Elative (from where?):   *-iš*
       Egressive (from which point?):   *-išen*
       Transitive (along where?):   *-ti*
       Terminative (to which point?):   *-ož*
       Approximative (in which direction?): *-lań*

                        (adapted from Winkler 2001, p. 17)

(255) *tat-*   'here'
       ot-   'there'
       nokit- 'nowhere'
       ut-   'below'
       vil-   'up'

                        (adapted from Winkler 2001, p. 43)

All the seven cases can be attached to most of these five adverbs, resulting in the following paradigm.

	Inessive	Illative	Elative	Egressive	Transitive	Terminative	Approximative
'here'	*tat-**in***	*tat-**ći***	*tat-**iš***	*tat-**išen***	*tat-**ti***	*tat-ći-**ož***	*tat-**lań***
'there'	*ot-**in***	*ot-**ći***	*ot-**iš***	*ot-**išen***	*ot-**ti***	*ot-ći-**ož***	*ot-**lań***
'nowhere'	*nokit-**in***	*nokit-**ći***	*nokit-**iš***	*nokit-**išen***	*nokit-**ti***	-	-
'below'	*ut-**in***	*ut-**e***	*ut-**iš***	*ut-**išen***	*ut-**ti***	-	*ut-**lań***
'up'	*vil-**in***	*vil-**e***	*vil-**iš***	*vi-**išen***	*vil-**ti***	-	*vil-**lań***

Table 7: paradigm for adverbs in Udmurt

(adapted from Winkler 2001, p. 43)

Turning to clauses marked by adpositions, Plann 1986 reports that Spanish allows such a pattern, in contrast to English.

(256) a. Luis soñaba   **con** [s llamar a casa].
Luis dreamed with   call   to home
Luis was dreaming of calling home.
 b. Luis soñaba   **con** [s que llamaba a casa].
Luis dreamed with   that he.called to home
Luis was dreaming that he was calling home.
 c. Luis se   oponía **a** [s que invitáramos   a   mucha gente].
Luis SELF opposed to   that we.invite.SUBJ ACC many   people
Luis was opposed to our inviting many people.

(Plann 1986, ex. 5e, ex. 7c, & ex. 6c)

Spanish allows any type of embedded clause under a preposition: (256a) is an infinite clause, (256b) a finite clause, and (256c) is a subjunctive clause. Lastly, clauses marked by case affixes are abundant in Burushaski, as shown by Anderson 2002. Some examples from his paper are given in (257).

(257) a. [s in-é   miríiŋe   wál-um]-**cum**
     he-ERG our.hands fell-PRTC-ABL
after he fell into our hands
 b. gani-yar tom-e   senimi [s [s ke   ĵaa aríiŋ guč^hiyam]-**ar** a-skaršaa]
axe-DAT tree-ERG said   COMP my hand I.give.you-DAT you.cut.it.Q
The tree said to the axe "if I give you my hand, will you cut it off".

(Anderson 2002, ex. 13 & ex. 19)

(257a) shows a temporal subordinate clause, which relation is marked by an ablative case affix, whereas (257b) illustrates a conditional clause, which relation is encoded via the dative case affix[68].

To conclude, case affixes and adpositions are distributionally equivalent: both have the same linearization options, both can appear on phrases and heads[69], and neither of them is restricted to nominal constituents.

---

[68] Anderson 2002 also shows that this option is not restricted to Burushaski, but appears in a number of other languages, cf. his section 2.

[69] Granting this equivalence, the artificial distinction between *phrasal affixes* on the one hand and *adpositional clitics* on the other hand vanishes. The two concepts refer to the same kind of element: a bound element that attaches to a phrase. Only the widespread idea that both properties are in fact incompatible leads to such terminological doublettes.

7.4.2.3 Selectional Equivalence

Despite their functional and distributional similarities, a number of arguments have been adduced in the literature (Jackendoff 1973; Riemsdijk 1978) against the joint grouping of case affixes and adpositions. These arguments (summarized in (258)) are based on alleged selectional differences between case affixes and adpositions.

(258) a. A case marked NP can be selected by an adposition, but never by a case affix.
       b. An adposition can be selected by an adposition, but never by a case affix.

If true, such differences would of course pose a serious challenge for a unfied treatment of case affixes and adpositions because the easiest way to capture their distributional differences would be to treat them as separate classes. On closer inspection, however, it turns out that none of these differences are correct and that case affixes and adpostions are selectionally equivalent as well.

With respect to (258a), there are a number of languages where this type of selection is found. Distinguishing between grammatical and adverbial cases, three out of four possible combinations regarding the direction of selection are attested.

(259)

		selector	
		grammatical case	adverbial case
selectee	grammatical case	√	√
	adverbial case	*	√

The term *selector* means 'selecting case affix', the term *selectee* 'selected case affix'. (259) summarizes that one finds situations where (i) a grammatical case affix selects a distinct grammatical case affix, (ii) an adverbial case affix selects a distinct adverbial case affix, and finally (iii) an adverbial case affix selects a grammatical case affix. An example for the first situation is given in table 8 from Romani[70].

	singular		plural	
	masculine	feminine	masculine	feminine
nominative	**čhavo**	**balval**	**čhave**	**balvala**
vocative	**čhavea**	**balvalie**	**čhavalen**	**balvalalen**
accusative	**čhaves**	**balvala**	**čhaven**	**balvalen**
dative	**čhaves-ke**	**balvala-ke**	**čhaven-ge**	**balvalen-ge**
genitive	**čhaves-koro**	**balvala-koro**	**čhaven-goro**	**balvalen-goro**
locative	**čhaves-te**	**balvala-te**	**čhaven-de**	**balvalen-de**
ablative	**čhaves-tar**	**balvala-tar**	**čhaven-dar**	**balvalen-dar**
instrumental	**čhaves-sar**	**balvala-sar**	**čhaven-sar**	**balvalen-sar**

Table 8: paradigm for *čhavo* (boy) and *balval* (wind) in Romani

(adapted from Friedman 1991, p. 87[71])

---

[70] Many Turkic languages show a similar pattern for the formation of the genitive; for example, in Crimean Tatar (Kavitskaya 2010, p. 38), we find *ev* (house.NOM.SG), *evni* (house.ACC.SG), and *evniŋ* (house.GEN.SG); similarly in Kazak (Somfai Kara 2002, p. 19), Kyrgyz (Somfai Kara 2003, p. 18), and Tatar (Poppe 1963, p. 38). From the available sources, it is however not clear whether this is a serious analytical option or not simply an accidental property. I leave it therefore only as a suggestion.

[71] In the same paper, Friedemann also persuasively shows that the case endings in Romani are really case endings and not postpositions.

What is of relevance in the paradigms of Romani is the formation of the dative and the genitive: both are formed by attaching the respective morpheme (**–ke** and **–koro**) not to the bare stems, but to the accusative marked stem. In other words, the dative case affix and the genitive case affix select an accusative case affix. And since dative and genitive are used for the marking of indirect objects and possessors (Halwachs et al. 2002; Matras 2004, p. 90), respectively, Romani presents a clear case where a grammatical case affix depends on another grammatical case affix.

Examples for the second situation where an adverbial case affix selects another adverbial case affix occur frequently in languages where local relations are expressed by case affixes[72]. Two examples are given in table 9 and table 10 for Tsez and Kolyma Yukaghir[73].

		direction		
location		allative	ablative	versative
'in'	**-ā**	**-ā-r**	**-āγ**	**-āγor**
'among'	**-λ**	**-λ-er**	**-λ-āγ**	**-λ-xor**
'on (horizontal)'	**-Λ'(o)**	**-Λ'o-r**	**-Λ'-āγ**	**-Λ-āγor**
'under'	**-Λ**	**-Λ-er**	**-Λ-āγ**	**-Λ-xor**
'at'	**-x(o)**	**-xo-r**	**-x-āγ**	**-x-āγor**
'near'	**-de**	**-de-r**	**-d-āγ**	**-d-āγor**
'on (vertical)'	**-q(o)**	**-qo-r**	**-q-āγ**	**-q-āγor**

Table 9: the system of local cases in Tsez

(adapted from Comrie & Polinsky 1998, p. 104)

	singular	plural
nominative	**āče-Ø**	**āče-pul-Ø**
accusative	**āče-gele**	**āče-pul-gele**
predicative	**āče-lek**	**āče-p-lek**
instrumental	**āče-le**	**āče-p-le**
comitative	**āče-n'e**	**āče-pul-n'e**
dative	**āče-ŋin**	**āče-pul-ŋin**
locative	**āče-ge**	**āče-pul-ge**
ablative	**āče-ge-t**	**āče-pul-ge-t**
prolative	**āče-ge-n**	**āče-pul-ge-n**

Table 10: paradigm for *āče* (domestic deer) in Kolyma Yukaghir

(adapted from Maslova 2003a, p. 4 & p. 73[74])

---

[72] Although not necessarily, as for example in Finnish, where each local case is expressed by a separate case affix, or in Lithuanian, as seen in the examples in (241).

[73] Tundra Yukaghir (Maslova 2003b, p. 52) has a similar pattern for the local cases but additionally distinguishes a generic locative.

[74] Although Maslova 2003a doesn't state explicitly that the ablative and the prolative are based on the locative, she indicates this implicitly through her morphemic analysis on p. 73. Moreover, the same author has written a grammar of the closely related language Tundra Yukaghir, and in this grammar (Maslova 2003b), Maslova is very explicit on the decomposition of the ablative into **-t** + the locative marker **–ge**, and of the decomposition of the prolative marker into **-n** + the locative marker **-ge** (Maslova 2003b, pp. 56-7).

Both languages illustrate the selection of an adverbial case affix by another adverbial case affix. Tsez marks seven kinds of location by case affixes; to these, distinct case affixes can be added indicating movement *to* that location (allative), movement *from* that location (ablative), and movement *towards* that location (versative). Basically, the allative marker is **–r**, the ablative marker is **–āy**, and the versative marker is **–γor**; and despite the fact that this transparency is masked by certain phonological processes, it is nevertheless present. The system of local cases in Kolyma Yukaghir is even more transparent: the ablative marker **–t** is attached to the locative marker **–ge**; similarly for the prolative marker **–n**, which indicates movement along or within a location. In sum, both Tsez and Kolyma Yukaghir illustrate the selection of an adverbial case affix by another adverbial case affix[75].

The third situation that is attested is the one where an adverbial case affix selects a grammatical case affix. An example for this has in fact already been given, viz. in the Romani paradigm. For, as a closer inspection reveals, the accusative is the form to which *all* other case affixes attach (except for the nominative and the vocative case affixes, which attach directly to the stem). In addition to the genitive and the dative, the locative, the ablative, and instrumental are formed by attaching the relevant marker to the accusative form of the noun. This is not a peculiarity of Romani. A similar pattern was present in the extinct languages Tocharian A and Tocharian B, and is still present in Ket[76], cf. tables 11 and 12, respectively.

	Tocharian A		Tocharian B	
	singular	plural	singular	plural
nominative	**yuk**	**yukañ**	**yakwe**	**yakwi**
genitive	**yukes**	**yukaśśi**	**yäkwentse**	**yäkweṃts**
obliquus	**yuk**	**yukas**	**yakwe**	**yakweṃ**
locative	**yuk-am**	**yukas-am**	**yakwe-ne**	**yakweṃ-ne**
ablative	**yuk-äs**	**yukas-äs**	**yakwe-mem**	**yakweṃ-mem**
allative	**yuk-ac**	**yukas-ac**	**yakwe-ś(c)**	**yakweṃ-ś(c)**
perlative	**yuk-ā**	**yukas-ā**	**yakwe-sa**	**yakwen-tsa**
instrumental	**yuk-yo**	**yukas-yo**	**-**	**-**
comitative	**yuk-aśśäl**	**yukas-aśśäl**	**yakwe-mpa**	**yakweṃ-mpa**
causal	**-**	**-**	**yäkwe-ñ**	**yäkweṃ-ñ**

Table 11: paradigm for *yuk* and *yakwe* (horse) in Tocharian A & B

(Gippert 1987, p. 23)

---

[75] Again, the Turkic languages show a strikingly parallel pattern (for examples, cf. the references from fn. 71: the locative suffix is *–da*, the ablative suffix is *–dan*, suggesting a decomposition such that that the actual morpheme for the ablative is *–n*, which obligatorily selects the locative marker *–da*. But as far as I know, the literature contains no such proposal, and I will therefore leave it as a speculation.

[76] A partly similar pattern is present in Lezgian (Northeast Caucasian), where all local cases attach to the ergative form of a noun (cf. Haspelmath 1993, p. 74).

| | animate | | | | inanimate | |
| | masculine | | feminine | | neuter | |
	singular	plural	singular	plural	singular	plural
absolutive	ōp	óvàŋ	ām	ámàŋ	súùl	súlàŋ
genitive	ób-dà	óvàŋ-na	ām-d(i)	ámàŋ-na	súùl-d(i)	súlàŋ-d(i)
ablative	ób-dà-ŋal	óvàŋ-na-ŋal	ám-dì-ŋal	ámàŋ-na-ŋal	súl-di-ŋal	súlàŋ-di-ŋal
dative	ób-dà-ŋ(a)	óvàŋ-na-ŋ(a)	ám-dì-ŋ(a)	ámàŋ-na-ŋ(a)	súl-di-ŋ(a)	súlàŋ-di-ŋ(a)
benefactive	ób-dà-t(a)	óvàŋ-na-t(a)	ám-dì-t(a)	ámàŋ-na-t(a)	súl-di-t(a)	súlàŋ-di-t(a)
adessive	ób-dà-ŋt(a)	óvàŋ-na-ŋt(an)	ám-dì-ŋt(a)	ámàŋ-na-ŋt(an)	súl-di-ŋt(a)	súlàŋ-di-ŋt(a)
locative	-	-	-	-	súl-kà	súlàŋ-ka
prosecutive	ób-bès	óvàŋ-bès	ám-bès	ámàŋ-bes	súl-bès	súlàŋ-bes
instrumental	óv-às	óvàŋ-as	ám-as	ámàŋ-as	súl-às	súlàŋ-as
caritive	óv-àn	óvàŋ-an	ám-àn	ámàŋ-an	súl-àn	súlàŋ-an
translative	óv-èsaŋ	óvàŋ-èsaŋ	ám-èsaŋ	ámàŋ-èsaŋ	súl-èsaŋ	súlàŋ-èsaŋ
vocative	ov-ó	ovaŋ-ó	am-á	amaŋ-ɔ́	-	-

Table 12: paradigm for *ōp* (father), *ām* (mother), and *súùl* (sled) in Ket

(Vajda 2004, p. 21)

The paradigm from Tocharian shows that all adverbial cases are formed by combining the relevant case affix with a noun in its oblique form, that is, with the form that marks the direct object. This true in both varieties of Tocharian, although the adverbial case affixes in Tocharian A differ from the ones used in Tocharian B. Ket illustrates the same point: among the four cases that select the genitive form of a noun are the two adverbial cases ablative and adessive, the latter one marking inter alia location. Ket incidentally also shows selection of a grammatical case by another grammatical case, viz. by the dative, which also selects the genitive form of a noun.

It remains to be seen whether the fourth logical possibility, where a grammatical case affix selects an adverbial case affix, is simply unattested or excluded on principled grounds. The case hierarchy as developed in Blake 2001 might provide such a principled explanation for it restricts the connection between the number of cases some language L possesses and the distinctions expressed by these cases. Without going into much detail, what is excluded is a language that has adverbial cases but no grammatical cases. This might explain the observed gap because forming a grammatical case on the basis of an adverbial case requires the presence of adverbial cases but not grammatical cases, a situation excluded by the case hierarchy.

In sum, despite claims to the contrary, case affixes can select case affixes.

Turning to (258b), although rare, there are languages where some adposition can be selected by a case affix. Such situations occur in languages that have directional cases and adpositions bearing a purely locative meaning. For example, Crimean Tatar has a postposition *tybynde* meaning 'under', as shown in (260).

(260)   qaja **tybynde**
        rock under
        under the rock

(Kavitskaja 2010, p. 82)

In order to refer to a movement whose starting point is under something, the ablative suffix **-n** is attached to the postposition, as shown in (261).

(261) men kitap-nɯ krovat **tybynde**-**n** al-dɯ-n
       I   book-ACC bed.GEN under-ABL take-PAST-1.SG
       I took the book out from under the bed.

(Kavitskaja 2010, p. 83)

This option is not restricted to 'under', but is "productive with most postpositions" (Kavitskaja 2010, p. 83). The same pattern can be found in Hungarian, Arawak, and Hunzib, as shown in (262), (263), and (264)[77], respectively.

(262) a. Hívjál fel tíz óra   **után**!
           call.SBJ PRT ten hour.NOM after
           Call me after ten o'clock!

(Rounds 2001, p. 201)

       b. három óra   **után-rá**
           three hour.NOM after-SUBL
           by after three o'clock

(Asbury 2008, p. 60, ex. 31b)

(263) a. konoko **loko**
           forest   in
           in the forest
       b. konoko-**nro**
           forest-DIR
           to the forest
       c. konoko **loko-nro**
           forest   in-DIR
           into the forest

(de Groot 2000, p. 827)

(264) a. tirə-**tl'o-tl'**
           bridge-SUPESS-TRNSL
       b. tirə-**tl'**   **tl'odo-tl'**
           bridge-SUPESS above-TRNSL
           over the bridge

(Berg 2004, p. 1369)

To conclude, the option that a case affix selects an adposition is also attested, contrary to earlier claims to the contrary.

---

[77] DIR = directional, SUBL = sublative, SUPESS = superessive, TRNSL = translative

7.4.2.4 Equivalence for Agreement Effects

Riemsdijk 1978, pp. 17-8, formulates yet another difference allegedly separating case affixes from adpositions, stated in (265).

(265) An element can agree for case marking, but never for adpositional marking.

Similar to the pattern where a case affix selects an adposition, this pattern is rare but not unattested. As already pointed out by Asbury 2008, pp. 49-50, Hungarian possesses this pattern.

(266) a. ab-**ban**   a   ház-**ban**
             this.LOC the house-LOC
             in this house
        b. a   **mögött**   a   ház   **mögött**
             this behind.LOC the house behind.LOC
             behind this house

                                                    (Asbury 2008, p. 50, ex. 10)

(267) a. ez-ek-**ben**   a   ház-ak-**ban**
             that-PL-LOC the house-PL-LOC
             in those houses
        b. ezek   **előtt**   a   házak   **előtt**
             that.PL in.front.of.LOC the house.PL in.front.of.LOC
             in front of those houses

                                                    (Rounds 2001, p. 162)

As both examples show, a demonstrative agrees both with case affixes and adpositions belonging to the head noun (which is *house* in all examples).
In addition to Hungarian, Pavel Caha informs me (p.c., 2011/12/07) that Amharic shows agreement for adpositional marking as well, cf. (268).

(268) a. tillik'-u-**n**   k'onjo-w(-**in**) bet
             big-DEF-ACC nice-DEF-ACC house
             the big, nice house
        b. **kä**-tillik'-u   (**kä**-)k'onjo-w   bet
             from-big-DEF   from-nice-DEF house
             from the big, nice house

                                                    (Tremblay & Kabbaj 1990, ex. 31)

In both examples, the second definite adjective within a constituent allows optional repetition of either a case affix (268b) or a preposition, as in (268b). This parallelism (among others) between case affixes and prepositions in Amharic has led Trembley & Kabbaj 1990 to the conclusion that such prepositions are not preposition but in fact case affixes (for a similar analysis, cf. Baker & Kramer, in press). Given the

present APG analysis, this dichotomy is a chimera, stemming from the wrong premise that case affixes and adpositions are two different classes.

7.4.2.5 Summary

I have shown in this section that case affixes and adpositions are equivalent, and therefore form one natural class, precisely as claimed by my APG analysis. This equivalence was shown to not only hold as far as the function of case affixes and adpositions is concerned, but to extend to distributional and selectional equivalence. Just as adpositions can precede, follow, or surround the nominal constituent, case affixes can also do so; moreover, like adpositions, case affixes can attach to phrases, and like case affixes, adpositions can attach to heads. Regarding selectional equivalence, it was shown that case affixes can select other case affixes and can even select adpositions, just as adpositions can. Last but not least, I have provided evidence that agreement for adpositional marking is possible, just like agreement for case marking.

7.4.3   A Benefit of the Closure Law

There is one important benefit benefit of the Closure Law, viz. that it excludes on principled grounds two non-attested instances of *multiple case marking*. This term refers to the phenomenon where an element has attached to it more than one case affix, as sketched in (269).

(269) $X\text{-}CAS_1\text{-}CAS_2\text{-}\ldots CAS_n$

Although this phenomenon is absent from the Indo European languages, it is cross-linguistically frequently attested (cf. Mel'čuk 2006, ch. 3; Plank 1995). As shown in Mel'čuk 2006, multiple case marking comes in four varieties, which differ with respect to the factor causing the appearance of two or more case affixes. These four varities are enumerated in (270).

(270)   *Typology of Multiple Case Marking*
      a.   Compound Case
      b.   Agreement Case
      c.   Group Inflection
      e.   Hypostasis

I briefly explicate each variety. *Compound Case* refers to a situation where a case marker selects another case marker. This situation has already been illustrated in this section, viz. in the discussion of case affixes selecting another case affix; cf. the paradigms for Romani (table 8), Tsez (table 9), Kolyma Yukaghir (table 10), Tocharian (table 11), and Ket (table 12). By *Agreement Case* (also called *case*

stacking or *Suffixaufnahme*), one refers to the situation where a case marked nominal A modifies some other nominal B which is also case marked, and where as a result of this modification relation between these two nominals, the modifying nominal A agrees in case with the modified nominal B such that A is additionally marked for the case B is specified for. This variety is attested in many Australian languages (cf. Dixon 1980, ch. 10; Richards 2012), but also in Old Georgian and Hurrian, as shown in (271) and (272).

(271) a. saxel-**man** mam-**isa**-**man**
           name-ERG father-GEN-ERG
           the name of the father
       b. saxel-**ita**   mam-**isa**-**jta**
           name-INSTR father-GEN-INSTR
           in the name of the father

                                                              (Mel'čuk 2006, pp. 159-160)

(272) tev-**āi**   teššop-**pe**-**āi**
       word-INSTR Teššop-GEN-INSTR
       by the word of Teššop

                                                              (Mel'čuk 2006, p. 160)

In all examples, a genitive marked nominal acts as a modifier to a noun; as modifiers in Old Georgian and Hurrian in general have to agree with the elements they modify in case, the modifying nominal also bears the case of the modified nominal, viz. ergative in (271a) and instrumental in (271b) and (272). *Group inflection* (also called *Suffixhäufung*) is yet another variety of multiple case marking which occurs in languages with phrasal case suffixes. If some constituent consists of a nominal A followed by modifying nominal B, then given the fact that case suffixes attach to phrases, both case suffixes appear attached to B, even though only one of it really belongs to B. This variety occurs for example in Aranda and Sumerian, illustrated in (273) and (274), respectively.

(273) a. wara iŋata-**kana**-**la**
           son   chief-GEN-ERG
           the son of the chief
                                                              (Mel'čuk 2006, p. 168)
       b. [NP-1 wara [NP-2 iŋata]-**kana**]-**la**

(274) a. é   šeš   lugalu-**ak**-**ak**-**a**
           house brother king-GEN-GEN-LOC
           in the king's brother's house
                                                              (Mel'čuk 2006, p. 168)
       b. [NP-1 é [NP-2 šeš [NP-3 lugalu]-**ak**]-**ak**]-**a**

As the structures indicate, although all case suffixes appear attached to the final nominal of the whole constituent, they belong to different nominals of the constituents. Lastly, by *hypostasis*, Mel'čuk 2006 refers to a situation where some

nominal A that usually acts as a modifier appears freestanding with the meaning 'that of A'. To this nominal are then attached the case suffixes that would usually appear on the unexpressed modified nominal. This attested for example in Basque and Georgian, illustrated in (275) and (276), respectively.

(275) a. Bilbo-**ko**   gizon-**arekin**
           Bilbao-GEN man-COM
           with the man from Bilbao
      b. Bilbo-**ko**-**arekin**
           Bilbao-GEN-COM
           with the one from Bilbao

(276) Q: V(i)-**is**   saxl-**s**   ežebs?
           who-GEN   house-DAT   look.you.for
           Whose house are you looking for?
      A: Čemi amxanag-**isa**-**s**.
           my   friend-GEN-DAT
           For that of my friend.

As both examples show, although both Georgian and Basque allow the modified noun to be unexpressed, the case suffix is retained, getting attached to the modifying noun, which attachment results in a sequence of two case suffixes.

Importantly, what is *unattested* according to Mel'čuk 2006 are the following two situations. First, a nominal bears two or more case affixes each of which keeps track of the grammatical relation borne by the nominal. In other words, what is unattested is that a language marks an element for the relations other than its final relation. For example, no language marks a passive subject by both an accusative case affix and a nominative case affix, the accusative marker reflecting its initial relation, and the nominative marker reflecting its final relation[78]. Second, what is also unattested is iterative case marking for the same grammatical relation some element bears. In other words, situations where element is marked more than once for the final relation it bears. For examples, no language marks a subject multiply for nominative case[79]. Both unattested situations are illustrated with German in (277) and (278).

---

[78] Gerdts & Youn 1988 claim that Korean does instantiate such a peculiar pattern of case stacking though, viz. in inversion contexts (cf. fn. 81). What they claim more specifically is that case marking on the inverted nominal registers both relations borne by that nominal. Schütze 2001 and Yoon 2004 however show that this analysis is untenable because this type of case stacking is not restricted to inversion contexts, nor is the second case suffix a real case suffix but more likely a topic or focus marker.

[79] Superficially, Korean seems to possess a pattern with two nominative markers; cf. Schütze 2001 and Yoon 2004. However, as both authors argue, the second nominative marker is likely to be a topic or focus marker homophonous with the nominative marker.

(277)   (278)
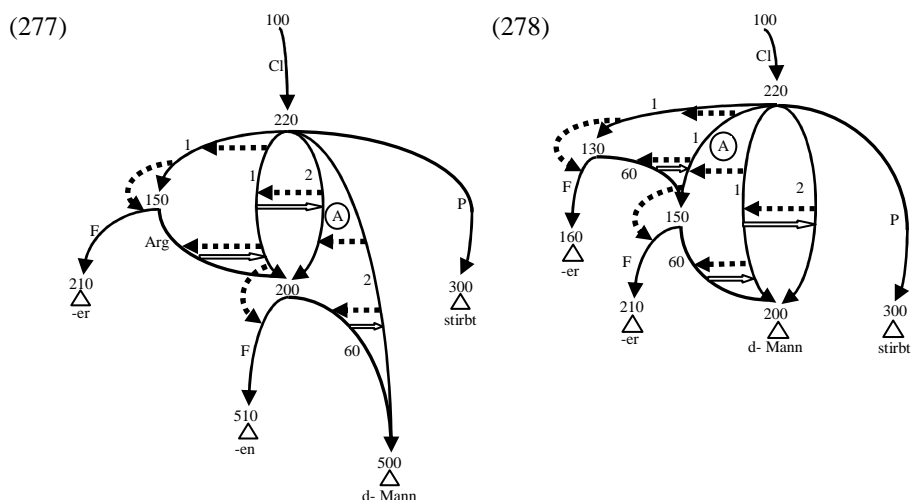
In the structure (277), the constituent bearing the subject relation is not only marked for this relation but also for the direct object relation it bore previously. In the structure (278), the constituent bearing a subject relation is marked iteratively for this relation. In other words, not only is the original 1-arc replaced-II, but also the replacer-II itself is replaced-II, resulting in iterative nominative marking. Importantly, both these structures are excluded by the Closure Law, cf. (279).

(279)   *The Closure Law*
        Object-Arc (A) ∧ Shallow Arc (A) ↔ Closure Arc (A)

The reason why the Closure Law excludes such pattern of multiple case marking on principled grounds has to do with its formulation as a biconditional. To see this, consider the arcs named 'A' in both structures. Both these arcs are closure arcs because both of them are replacers-II. Importantly, given its formulation as biconditional, the Closure Law not only specifies a necessary condition for object arcs that are shallow arcs, it also specifies a necessary condition for closure arcs. In other words, the Closure Law not only specifies the properties of the elements that have to undergo case marking, viz. that they have to be object arcs and shallow arcs, it also specifies the properties of case-marked elements themselves. It is the latter specification that the arcs named 'A' in (277) and (278) violate. For although they are closure arcs and object arcs, they are *not* shallow arcs. The definition of shallow arc is repeated for convenience in (280).

(280)   Def.: *Shallow Arc*
        Shallow Arc (A) ↔ Structural-Arc (A) ∧ Output Arc (A) ∧ ∀B (F-Erase (B,A) → Overlay-Arc (B))

The reason the two A arcs are not shallow arcs is because they violate the condition on admissible erasers. Arc A in (277) is locally erased and therefore violates the

definition of output arc because output arcs are defined as arcs that are not locally erased. Since shallow arcs have to be output arcs, and since A in (277) is not an output arc, it is not a shallow arc either. Arc A in (278) violates the condition on admissible F-erasers stated in the definition of shallow arc: for shallow arcs must only be F-erased by overlay-arc arcs. But A in (278) is F-erased by a 60-arc and 60-arcs are not overlay-arc arcs but argumental-arcs.

7.4.4 Open Ends

There are three issues connected to the analysis of case and adpositional marking where the analysis needs refinement which I would like to mention.

First, the restriction on object arcs in the formulation of the Closure Law leads to the problem that case on predicate nominals remains unaccounted for. I have at this point no good idea how to deal with case marking on predicate nominals.

Second, the formulation of language particular rules for the determination of the specific case and adpositional marking structures are formulated as biconditionals. Under this perspective, each grammatical relation determines a unique flagging structure, and each flagging structure is determined by a unique grammatical relation. Both conditions tightly restrict the connection between flagging and grammatical relation, and both face immediate problems. The first condition seems to be too strong because it entails that directionals for example always determine a unique flagging structure. Given the formulation of the German Directional Rule in chapter 6, repeated here for convenience in (281), directionals are expected to always be expressed by a flagging structure consisting of the flag *an* plus a pioneer labeled '2'. But this is obviously false in light of data such as in (282).

(281) *German Directional Rule*
Dir-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) ∧ Branch (C,A) ↔ F-Arc (B)
∧ PH-Headed (B,an) ∧ (Pioneer (C) ∧ Neighbor (C,B) ∧ 2-Arc (C)

(282) a. Maria geht **an** den   Tisch.
          Maria goes on the.ACC table
          Maria goes to the table.
      b. Maria geht **zu** der   Frau.
          Maria goes to the.DAT woman
          Maria goes to the woman.
      c. Maria geht **nach** Berlin.
          Maria goes after Berlin
          Maria goes to Berlin.
      d. Maria geht **in** die   USA.
          Maria goes in the.ACC US
          Maria goes to the US.

As can be seen, directionals can be marked by a number flagging structures, differing both with respect to the shape of the flag and to the labeling of the pioneer. However, such data don't necessarily cause a problem. It could be the case that different types of directional relations are involved in (282). It is also possible that one is dealing with one type of directional in (282) but that the rule needs to be split up into several rules all of which take semantic properties of the element heading the pioneer into account. Both options are promising because both are independently required. Different directional relations are motivated because languages with many local cases distinguish a number of directional cases, varying with respect to the precise direction or with respect to whether or not the goal is reached (cf. Stolz 1992 and references in fn. 65). And sensitivity of flagging to semantic factors is well-documented in cases with differential object marking, where the marking of an object depends on semantic factors of that object (cf. Bossong 1985).

The condition that each flagging structure is determined by a unique grammatical relation seems initially to be too strong as well. More specifically, it clashes with the observation that case and adpositional marking is generally not restricted to a unique grammatical relation. For example, accusative case is also used to mark relations other than direct object in German (and also other languages), for example adverbials specifying temporal extension and 4-objects (cf. section 7.3 of the chapter 6), as shown in (283).

(283) a. Ich habe **den**   **ganzen Tag** auf   ihn gewartet.
             I   have the.ACC whole   day upon him waited
             I waited for him all day long.
       b. Peter hat **den**   **Beweis** vernommen.
             Peter has the.ACC proof   heard
             Peter has heard the proof.

This observation however poses no real challenge because of the availability of (i) unflagged closure arcs, and (ii) sequences of closure arcs. More specifically, the relevant relations in (283) only require a pioneer labeled '2' but no flag, as specified by the respective rules in (284) and (285).

(284) *German Extension Rule*
       Ext-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) → (Pioneer (B) ∧ 2-Arc (B)

(285) *German 4-Arc Rule*
       4-Arc (A) ∧ Closure Arc (A) ∧ Branch (B,A) → (Pioneer (B) ∧ 2-Arc (B)

Given the rule for 2-arcs specifying accusative case, the following structures in (286) and (287) for the bold set elements in (283) are specified by these rules.

(286) 100

Ext

200

2 Ext

2

310

F 60

410 400
-en d- ganzen
Tag

(287) 100

4

200

2 4

2

310

F 60

410 400
-en d- Beweis
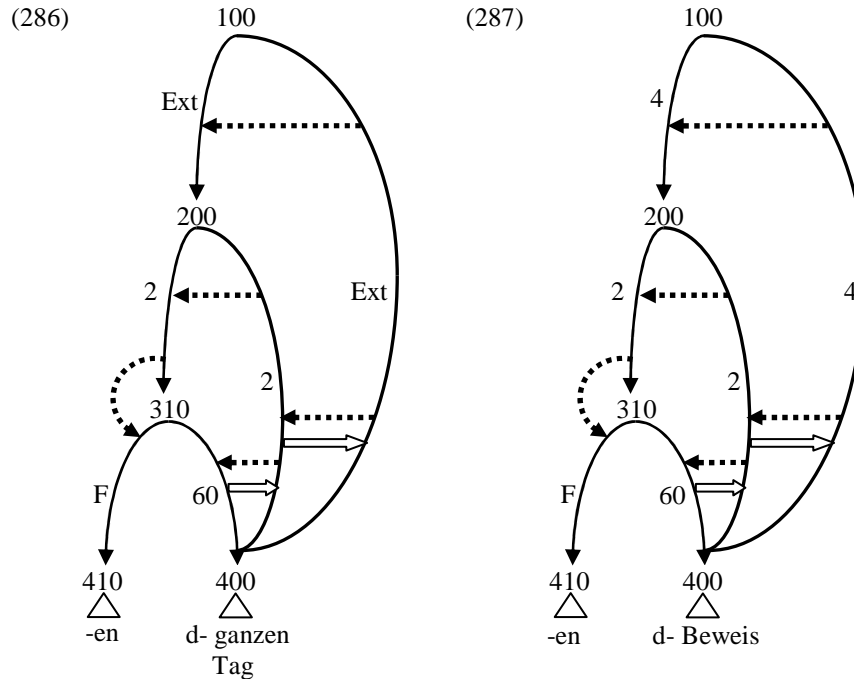
Finally, there are some[80] instances of quirky case marking that are incompatible with the analysis for case and adpositional marking developed in the previous chapter. The problem stems from the same condition that causes trouble for the examples in (282), viz. that a grammatical relation uniquely determines some flagging structure. There are two sets of data where this leads to wrong results. First, Perlmutter & Moore 2000 and Moore & Perlmutter 2002 argue that Russian contains two types of dative subjects, one derived by inversion (cf. fn. 81), and one featuring initial subjects marked by dative. The latter type of dative-marked subject is incompatible with the analysis so far, because surface subjects are expcted to show up with nominative only. Second, Andrews 1990 shows that quirky case marked subjects undergoing Subject-to-Object Raising in Icelandic retain their quirky case despite their final status of direct objects in the main clause. Such marking of direct object is also incompatible with the analysis from the previous chapter because direct objects should determine a unique flagging structure. At this point, I have no idea how to handle these problems[81].

---

[80] This restriction is inserted in purpose because most instances of quirky case marking pose no problem because they involve what is called *inversion* in APG (a term inherited from its predecessor Relational Grammar), by which term one refers to a structure where the initial subject of a transitive clause demotes to direct or indirect object whereas the initial direct object advances to subject. Given the surface status as indirect (or direct) objects of the elements to be marked, dative (or accusative) marking for them is expected because they are only initial subjects, and initial relations never determine case or adpositional marking.

[81] Kuroda 2005 argues that contrary to Perlmutter & Moore 2000 and Moore and Perlmutter 2002, dative subjects in Russian always result from inversion (cf. fn. 81). If true, the problem with Russian disappears.

7.5   Summary

I have argued in this chapter that the seemingly idiosyncratic assumptions employed in the analysis for wh-copying are not idiosyncratic or *ad hoc*, but can be employed for the analysis of a number of data having nothing to do with wh-copying. These data include repeated antecedents, false proforms, successive cyclicity effects, covert movement, partial movement, wh-agreement, and complementizer alternations in extraction contexts. It was also shown that guiding assumption underlying the analysis of case and adpositional marking, viz. that case affixes and adposition form one natural class, is crosslinguistically well supported. Finally, I have also addressed some problems with the analysis of proforms and the analayis fro case and adpositional marking, and concluded that the problems for the former analysis are not real because they rest on false premises.

Chapter 8

Wh-Copying and Variation

8.1 Introduction

Although the topic of this thesis is wh-copying, the focus has been so far put on only one variety of wh-copying, viz. one where complex wh-phrases are licit as extracted elements and where d-proforms are licit as resuming elements. A representative example of this variety is given in (1).

(1) **Welchen Mann** glaubst du   <u>den</u> sie t eingeladen hat?
     which   man   believe you who she invited   has
     Which man do you think she has invited?

But as touched on in chapter 3, this variety of wh-copying is not the only representative of wh-copying. The aim of this chapter is to investigate the variation of wh-copying structures in more detail and to show that a characterization of wh-copying structures is possible that is general enough to encompass this variation.
The organization of this chapter as follows. In section 2, I examine a more restrictive variety of wh-copying found in German in which neither complex wh-phrases nor d-proforms are licit. I show that this variety is compatible with the analysis I gave for the more liberal variety of wh-copying and argue that the differences stem from a single factor differentiating the restrictive and the liberal varieties. In section 3, I turn to Afrikaans, where yet another pattern can be found, one which requires the extracted element and the resuming element to be identical. This pattern is different from the previous two because although identity between the extracted element and the resuming element is possible in these two varieties, it is not required. In section 4, I then formulate a general characterization of wh-copying in section 4.

8.2 A Restrictive Variety of Wh-Copying in German

The majority of the data reported so far are from a liberal variety that has so far not been investigated in the literature on German wh-copying. The focus of previous

investigations was a more restrictive variety that differs in two respects from the liberal variety. First, complex wh-phrases are by and large excluded as extracted elements. And second, only wh-proforms are permitted as resuming elements, but not d-proforms. So whereas all the sentences in (2) and (3) are grammatical in the liberal variety, only the ones in (3) are grammatical in the restrictive variety.

(2)   √ in the liberal variety, * in the restrictive variety
    a. **Wen** glaubst du <u>den</u> sie liebt?
      who believe you who she loves
      Who do you think she loves?
    b. **Welchen Mann** glaubst du <u>den</u> sie t eingeladen hat?
      which man believe you who she invited has
    c. **Welchen Mann** glaubst du <u>wen</u> sie t eingeladen hat?
      which man believe you who she invited has
      Which man do you think she has invited?
    c. **Mit wem** glaubst du <u>mit dem</u> Hans t spricht?
      with whom believe you with whom Hans speaks
      Who do you think Hans is talking to?
    e. **Mit welchem Mann** glaubst du <u>mit wem</u> er sich t getroffen hat?
      with which man believe you with whom he SELF met has
    f. **Mit welchem Mann** glaubst du <u>mit dem</u> er sich t getroffen hat?
      with which man believe you with whom he SELF met has
      Which man do you think he met with?
    g. **In welchem Haus** glaubst du <u>wo</u> er t wohnt?
      in which house believe you where he lives
    h. **In welchem Haus** glaubst du <u>in dem</u> er t wohnt?
      in which house believe you in that he lives
      In which house do you think he lives?

(3)   √ in both varieties
    a. **Wen** glaubst du <u>wen</u> sie liebt?
      who believe you who she loves
      Who do you think she loves?
    b. **Mit wem** glaubst du <u>mit wem</u> Hans t spricht?
      with whom believe you with whom Hans speaks
      Who do you think Hans is talking to?
    c. **Wo** glaubst du <u>wo</u> sie sich t getroffen haben?
      where believe you where they SELF met have
      Where do you think that they met?
    d. **Wann** glaubst du <u>wann</u> wir uns t treffen sollten?
      when believe you when we us meet should
      When do you think we should meet?

At first sight, this contrast seems to suggest that the restrictive variety involves a full copy of the extracted element as resuming element, coupled with a restriction on admissible extracted elements, viz. one which excludes complex wh-phrases as extracted elements. This account correctly excludes all sentences in (2) because they

either involve a complex wh-phrase as an extracted element (2a'-2c') or involve a non-copy of the extracted element as a resuming element (2a). The account also correctly includes all the sentences in (3) because they all feature a full copy of the extracted element as a resuming element and don't contain complex wh-phrases as extracted elements (the PP in (3b) doesn't count as a complex wh-phrase because complex wh-phrases require a lexical noun in order to count as complex). However, as shown in chapter 3, this account is not viable. This was argued on the basis of data showing that the restrictive variety is subject to the generalization that the resuming element is a free relative proform. These data are repeated in (4) and (5).

(4)   a. $^?$**Weshalb** glaubst du   <u>weshalb</u> sie t weint?
        b.$^{??}$**Warum** glaubst du   <u>warum</u>   sie t weint?
        c.* **Wozu**   glaubst du   <u>wozu</u>   sie t weint?
        d.* **Wieso**   glaubst du   <u>wieso</u>   sie t weint?
            why   believe you why   she cries
            Why do you think she cries?
        e.* **Inwieweit**   glaubst du   <u>inwieweit</u>   sie t Recht hat?
        f.* **Inwiefern**   glaubst du   <u>inwiefern</u>   sie t Recht hat?
            to.what.extent believe you to.what.extent she right   has
            To what extent do you think she's right?

(5)   a. $^?$Ich komme <u>weshalb</u> man mich t gerufen hat.
        b.$^{??}$Ich komme <u>warum</u>   man mich t gerufen hat.
        c.* Ich komme <u>wozu</u>   man mich t gerufen hat.
        d.* Ich komme <u>wieso</u>   man mich t gerufen hat.
            I   come   why   one me   called has
            I come for the reason for which I was called.
        e.* Sie hat Recht <u>inwieweit</u>   er auch t Recht hat.
        f.* Sie hat Recht <u>inwiefern</u>   er auch t Recht hat.
            she has right   to.what.extent he also   right has
            She is right to the extent to which he is right.

The data in (4) contain wh-copying sentences in which the resuming element is a copy of the extracted element but which are nevertheless either judged marginal or ungrammatical. The sentences in (5) show that the use of the offending resuming elements as free relative proforms results in the very same judgments. As the parallelism between (4) and (5) makes clear, the restricted variety is also subject to the constraint that elements that are illicit as resuming elements are likewise illicit as free relative proforms.

Apart from the fact that the restrictive variety – like the liberal variety – is subject to the constraint that the resuming element is a free relative proform, the restrictive variety is also subject to the same agreement restrictions as the liberal variety. This is briefly illustrated in (6).

(6)   a.* **Wen**   glaubst du   <u>was</u> sie t eingeladen hat?
            who.MASC believe you what she   invited   has
            Who do you think she has invited?

    b.* **Wen**   glaubst du <u>wem</u>   er t die lateinische Sprache lehren wird?
       who.ACC believe you who.DAT he the Latin   language teach will
       Who do you believe he teaches the Latin language?
    c.* **Um**   **was** glaubst du <u>für was</u> er sich t bewirbt?
       around what believe you for what he SELF applies
       What do you think he applies for?
    d.* **Wo**   glaubst du <u>wann</u> sie sich t getroffen haben?
       where believe you when they SELF met   have
       Where do you think that they met?

As shown by these examples, the extracted element and the resuming element have to agree in (i) φ-features (cf. 6a), (ii) case features (cf. 6b), and (iii) prepositional marking (cf. 6c); in addition, if both elements are adverbs, then they have to be relationally equivalent (cf. 6d).

Given that the restrictive variety is subject to the same conditions regulating the properties of the resuming element as the liberal variety, the question is consequently what factor distinguishes the liberal from the restrictive variety. The mere exclusion of complex wh-phrases cannot be the relevant factor because this would not account for the exclusion of d-proforms as resuming elements in the restrictive variety. And although their usage as free relative proforms is uncommon, d-proforms are available as free relative proforms for speakers of the restrictive variety, especially when they appear in subject position.

(7)   <u>Der</u>   dort im   Bundestag reden wird ist ein alter weißhaariger Mann[1].
       that.one there in.the parliament speak will is an old   white-haired man
       He who will give a speech in the parliament is an old man with white hair.

But d-proforms as resuming elements remain sharply ungrammatical even when they are subjects.

(8)   * **Wer** glaubst du <u>der</u> t sie gesehen hat?
       who believe you who she seen   has
       Who do you think saw her?

In order to capture the exclusion of both complex wh-phrases as extracted elements and d-proforms as resuming elements, one either has to state the two restrictions separately, or one shows that there is a more general factor at work, one that excludes both complex wh-phrases as extracted elements and d-proforms as resuming elements.

I suggest that there is indeed a single factor at work. Informally, the restrictive variety requires *the determiner of the resuming element to be identical to the determiner of the extracted element*. Expressed more formally, the rule for wh-copying in the restricted variety looks as follows.

---

[1] www.spiegel.de/panorama/gesellschaft/0,1518,787620,00.html

(9)   *Wh-Copying Rule German, Restricted Variety*
        Mediator (A) ∧ Rel-marker (B,A) → ∃C (Replace (C,B) ∧ ∀D∀E (D-arc (D
        ∧ E) ∧ R-Branch (D, A) ∧ Branch (E,C) → Overlap (D,E)))

The rule in (9) differs from that for the liberal variety in that it puts an extra
restriction on the D-arcs of both the extracted element and the resuming element (the
underlined part in (9)). The effect of this extra restriction is that the D-arc of the
resuming element and the D-arc of the extracted element have to be headed by an
element that is both compatible with (i) its function as determiner internal to the
extracted element and (ii) its function as a resuming element. I exemplify the general
structure for wh-copying satisfying this rule.
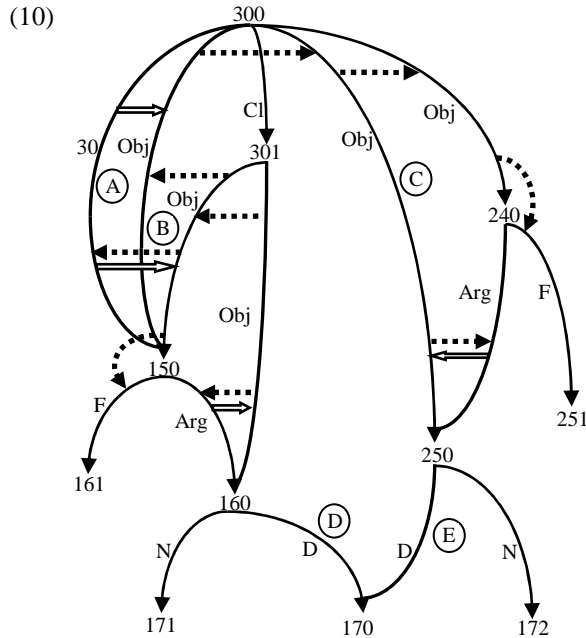
The naming of the arcs in this structure corresponds to the one in the rule in (9). So
arc C is the replacer defining the resuming element, arc A is the mediator, and arc B
is the relational marker, that is, the arc which C replaces. Arc D is the D-arc headed
by the determiner internal to the extracted element (the extracted element heads the
mediator), and arc E is the D-arc headed by the determiner of the resuming element.
And as required by rule (9), E and D overlap. This gives the desired outcome that
the determiner of the resuming element is identical to the determiner of the extracted
element.
Importantly, this one extra condition in the rule captures at once both differences
distinguishing the restricted from the liberal variety. Consider first the exclusion of
d-proforms as resuming elements. The structures for two wh-copying structures
containing a d-proform as a resuming element in the restricted variety are given in
(11) and (12), again exemplified with extracted objects.

(11)
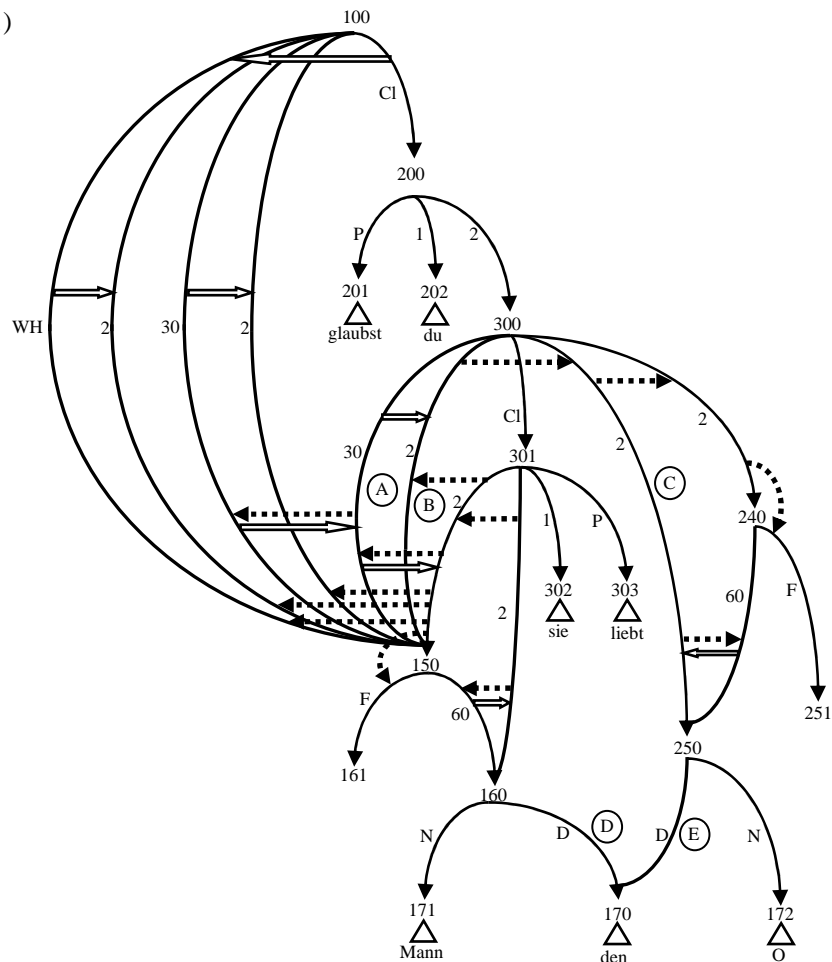
Although this structure satisfies (9), the resulting sentence in (12) is ungrammatical.

(12) ***Den Mann** glaubst du <u>den</u> sie t liebt?
　　　　the　man　believe you who　she　loves
　　　　Intended: Which man do you think she loves?

The reason for the ungrammaticality of this structure is easy to identify: as shown in section 9 of chapter 6, d-proforms cannot be used interrogatively, cf. (13).

(13) ***Den** Mann　kennst du　t?
　　　　the　man　　know　you
　　　　Intended: Which man do you know?

For the same reason, the following structure in (14) is also excluded.

(14)
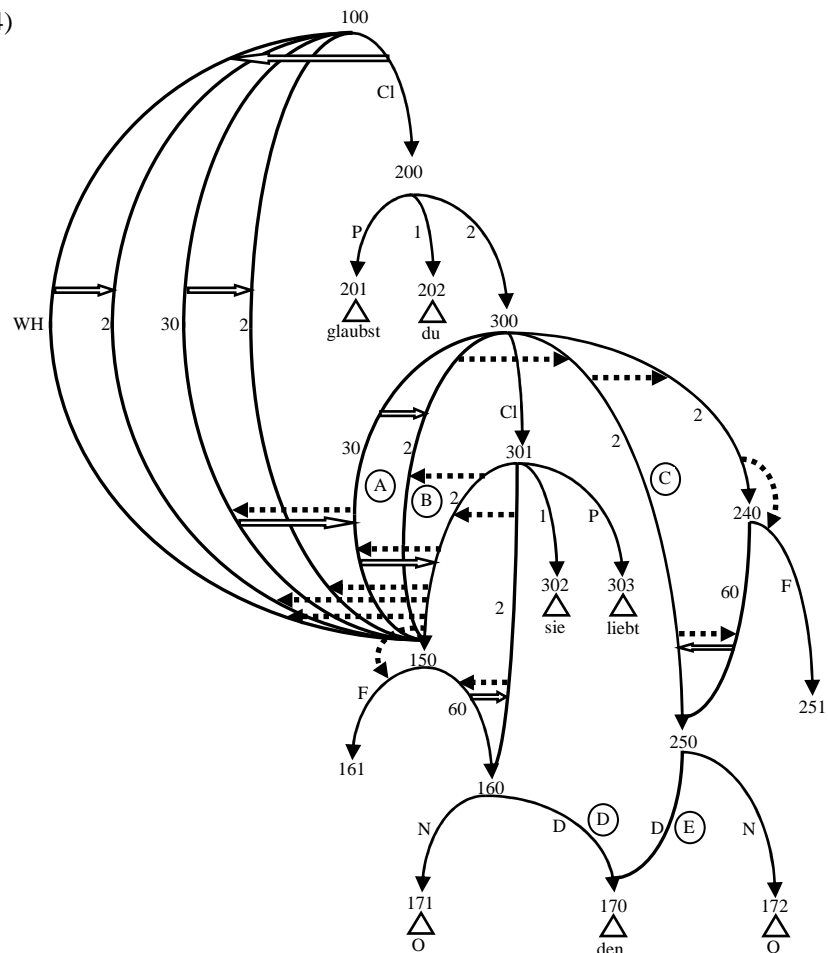
This structure corresponds to (15a), containing a d-proform as an interrogative element. But these are simply unavailable as interrogative elements (cf. (15b), hence the ungrammaticality.

(15)   a.* **Den**   glaubst du <u>den</u> sie t liebt?
            that.one believe you who she loves
            Intended: Who do you think she loves?
       b.* **Den**   kennst du t?
            that.one know you
            Intended: Who do you know?

Given the requirement expressed in the rule in (9) that the D-arc has to be identical in both the extracted element and the resuming element, the use of a d-proform as a resuming element requires the use of that d-proform as a determiner in the extracted

element. But this is impossible, because the d-proform would appear internal to a constituent that has to be compatible with interrogativity. But as the examples in (13) and (15b) show, d-proforms are simply incompatible with this function. Wh-proforms however can be used as resuming elements, as shown in (17) for (16).

(16)　**Wen** glaubst du　 wen sie t liebt?
　　　 who believe you who she loves
　　　 Who do you think she loves?

(17)
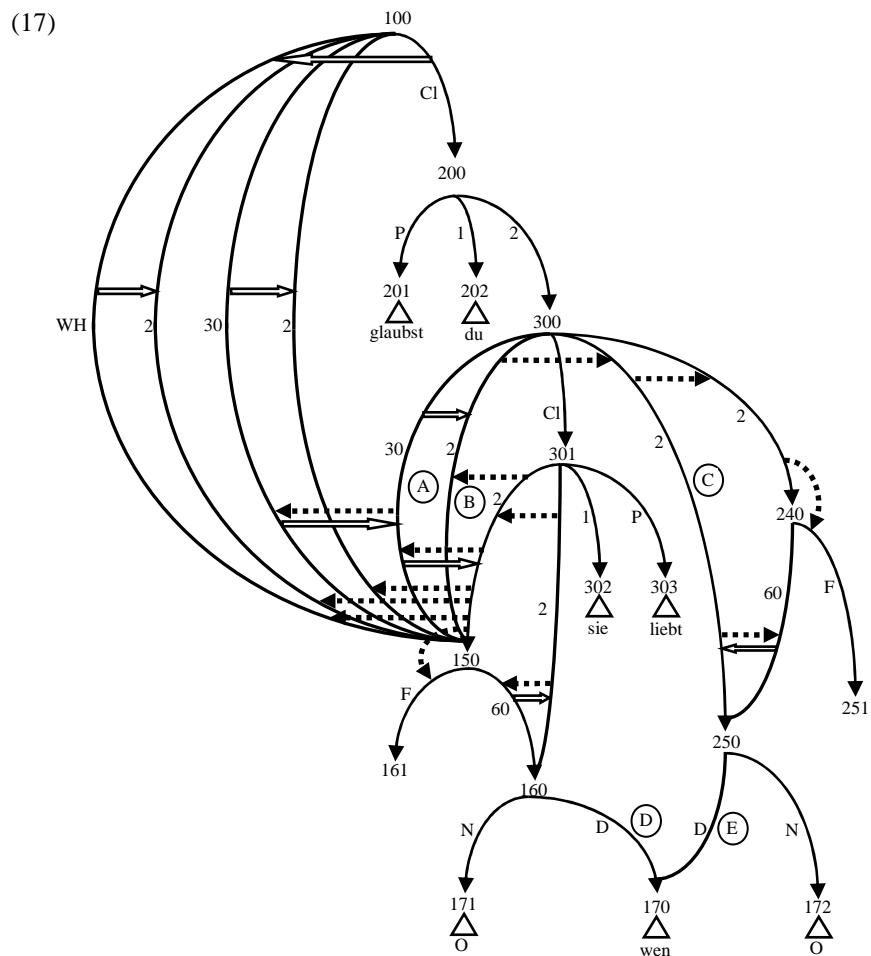
The grammaticality of this structure (and of the corresponding sentence) comes as no surprise because wh-proforms can be used both as free relative proforms and interrogatively, as shown in (18).

(18) a. **Wer** t im   Bundestag reden will   muss einen Anzug tragen.
          who   in.the parliament speak wants must a   suit   wear
          He who wants to give a speech in the parliament has to wear a suit.
     b. **Wen** kennst du t?
          who know you
          Who do you know?

In sum, since only wh-proforms can be used both as interrogative elements and as free relative proforms, only they are consequently licit as resuming elements in the restricted variety.

I now turn to the exclusion of complex wh-phrases. The general reason why these are excluded is because they all contain determiners that cannot be used as free relative proforms, and therefore not as resuming elements either. And conversely, the determiners that can be used as resuming elements cannot be used as determiners inside complex wh-phrases. Starting with the second point, consider the structure in (19) corresponding to (20).

(19)
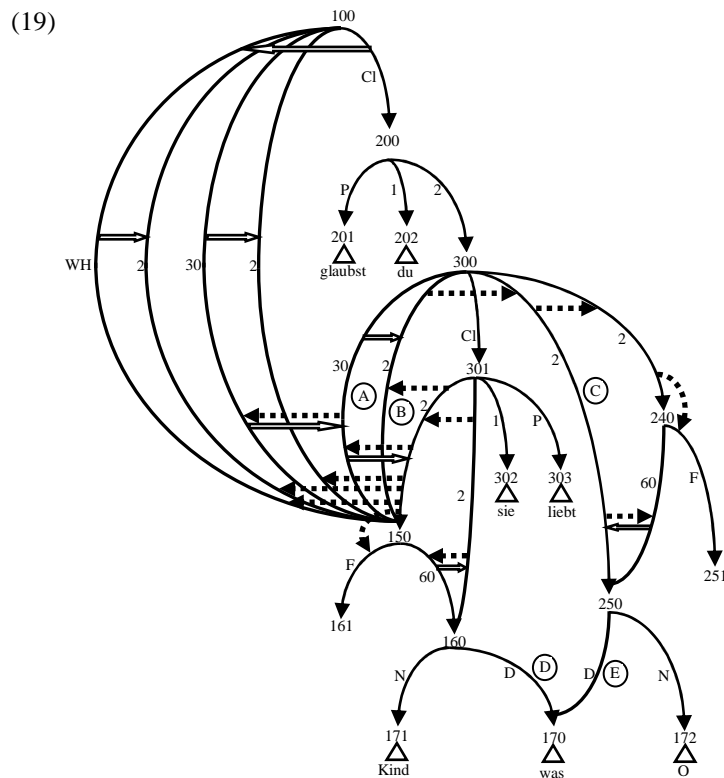
(20) * **Was Kind** glaubst du   <u>was</u>   sie t liebt?
       what child believe you what she loves
       Intended: which child do you think she loves?

The resulting sentence is ungrammatical, despite the fact that the structure obeys the rule in (9). This however follows from the more general fact that wh-proforms cannot be used as determiners in German (cf. 21a), contrary to English (cf. 21b).

(21)   a.* Was Kind liebt sie t?
            what child loves she
       b. √*What child does she love?*

Turning to the first point, consider the following complex wh-phrases.

(22)   a. welcher X   (*which X*)
       b. was für ein X   (*what a X*)
       c. wem sein X   (*whose X*)
       d. wessen X   (*whose X*)

To satisfy (9), the determiner defining the resuming element has to be identical to the determiner internal to the complex wh-phrase. In other words, satisfying the rule in (9) results in sentences such as those in (23) for the complex wh-phrases in (22)

(23)   a.* **Welchen Mann** glaubst du   <u>welchen</u> sie t liebt?
            which   man   believe you which   she loves
            Which man do you think she loves?
       b.* **Was für einen Mann** glaubst du   <u>was für einen</u> sie t liebt?
            what for a   man   believe you what for a   she loves
            What man do you think she loves?
       c.* **Wem seinen Mann** glaubst du   <u>wem seinen</u> sie t liebt?
            who his   man   believe you who his   she loves
            Whose husband do you think she loves?
       d.* **Wessen Mannes** glaubst du   <u>wessen</u> sie t gedenken?
            whose man   believe you whose they commemorate
            Whose husband do you think they commemorate?

That these sentences are ungrammatical, that is, complex wh-phrases as extracted elements, despite the fact that (9) is obeyed is due to an independent factor. For all these wh-phrases contain determiners that are not permitted as free relative proforms, as shown in (24).

(24)   a.* **Welcher** t im   Bundestag reden will   muss einen Anzug tragen.
            which   in.the parliament speak wants must a   suit   wear
       b.* **Was für einer** t im   Bundestag reden will   muss einen Anzug tragen.
            what for a   in.the parliament speak wants must a   suit   wear
       c.* **Wem seiner** t im   Bundestag reden will   muss einen Anzug tragen.
            who his   in.the parliament speak wants must a   suit   wear
            He who wants to give a speech in the parliament has to wear a suit.
       d.* **Wessen** wir t gedenken   gedenkt   ihr auch.
            whose we   commemorate commemorate you also
            We commemorate who you commemorate as well.

But the resuming element must be a licit free relative proform as well. Since this independent requirement is not fulfilled by the sentences in (23), as revealed by those in (24), the structures corresponding to the sentences in (23) are not well-formed. This is exemplified in (25) for sentence (23a).

(25)
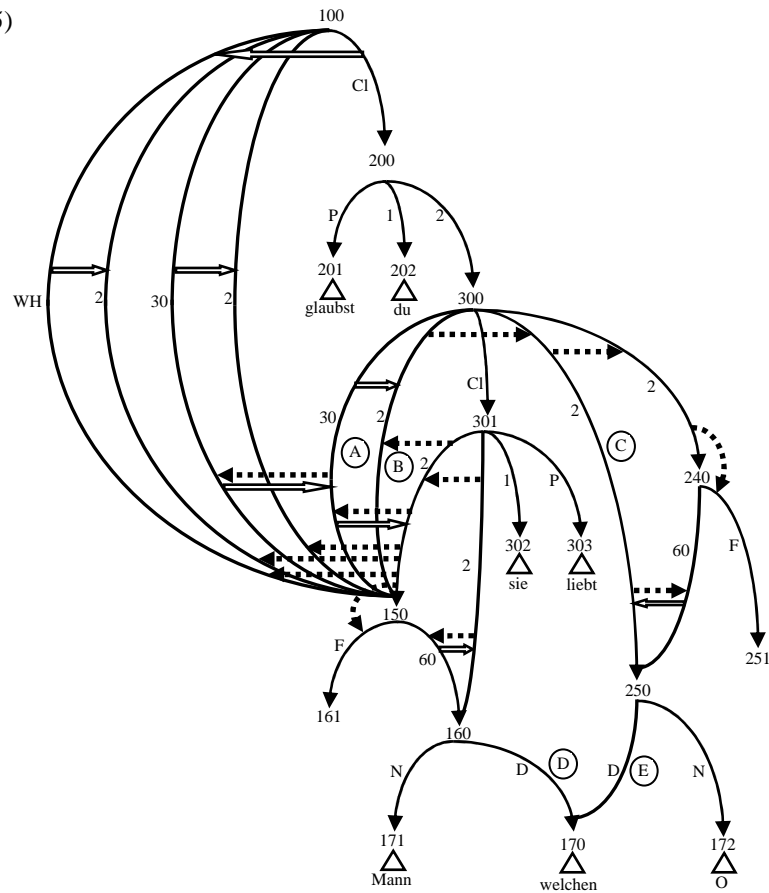
The reason this structure is not well-formed is because the determiner *welchen* appears in a structural context that violates the German Wh-Determiner Rule formulated in chapter 6. According to this rule, D-arcs headed by wh-determiners are banned from positions where they neighbor arcs headed by members of the set Inexplicit, thereby ruling out the use of wh-determiners as resuming elements and as free relative proforms. In (25), however, the arc headed by the wh-determiner *welchen* does appear in a position neighboring an arc headed by a member of Inexplicit, viz. *O*, so that the structure is not well-formed.

This treatment predicts that *some* complex wh-phrases can be available as extracted elements even in the restricted variety, viz. those that contain a determiner that is permitted as a free relative proform. And as touched on in chapter 3, one such

complex wh-phrase does exist, viz. the type consisting of a wh-proform accompanied by a modifying phrase, two examples of which are given in (26).

(26)   wen von den X (*which of the X*)
        wen aus X (*who from X*)

This type of complex wh-phrase is permitted as an extracted element even for speakers of the liberal variety.

(27)   a. **Wen von den Männern** glaubst du   <u>wen</u> sie t liebt?
            who of   the men   believe you who she   loves
            Which of the men do you think she loves?
        b. **Wen aus   Berlin** glaubst du   <u>wen</u> sie t liebt?
            who from Berlin believe you who she   loves
            Which from Berlin do you think she knows?

Consider structure (28) for (27a).

(28)
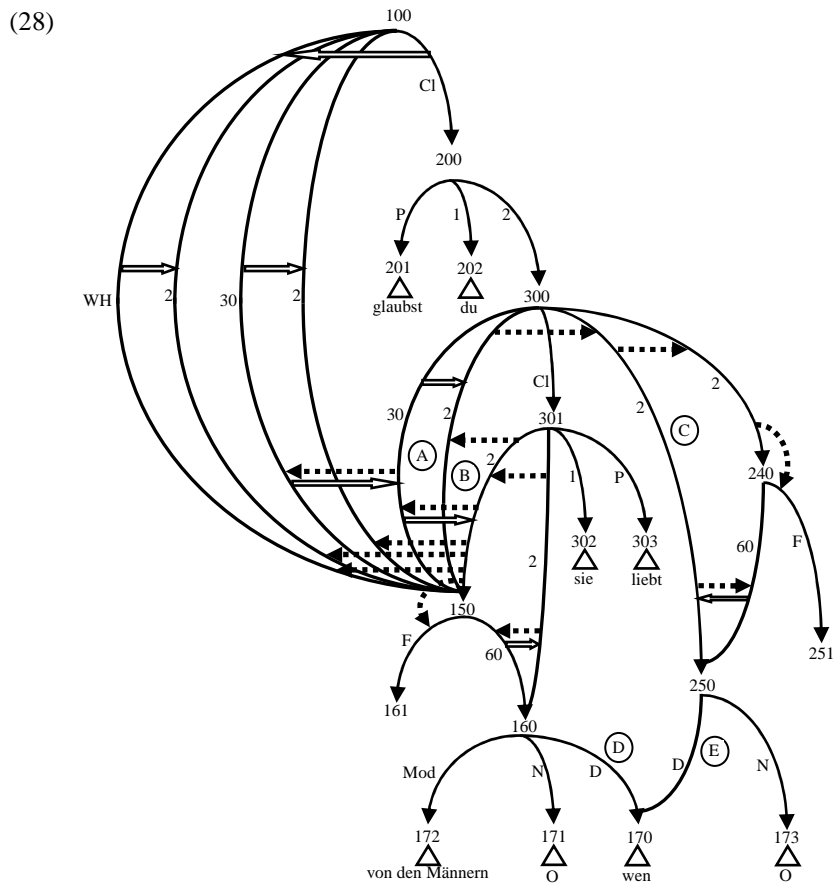
The reason this structure is well-formed is because the wh-proform *wen* appears in two structural contexts that are both compatible with the context required by the rule restricting the appearance of wh-proforms, viz. the German Wh-Proform Rule 1 of chapter 6. According to that rule, D-arcs headed by wh-proforms are restricted to positions where they neighbor arcs headed by members of the set Inexplicit. As this constraint is satisfied in this structure, the structure is well-formed.

To summarize, I have shown in this section that the restrictive variety of German is compatible with the analysis developed for the liberal variety. More specifically, I have argued that the restrictive variety puts an extra requirement on the resuming element, viz. that the determiners of the resuming element and the extracted element have to be identical, which captures both restrictions at once.

8.3   The Afrikaans Variety of Wh-Copying[2]

Afrikaans is a West Germanic language closely related to Dutch mainly spoken in South Africa and Namibia. It also has wh-copying but represents yet a third pattern with respect to the relation between the extracted element and the resuming element. Similar to German, Afrikaans wh-copying shows all signs of a regular extraction construction. It is categorially unrestricted:

(29)   a. **Wie** dink jy <u>wie</u> het sy t lief?
            who think you who has she sweet
            Who do you think she loves?
        b. **Wat** dink jy <u>wat</u> sy t gekoop het?
            what think you what she bought has
            What do you think she has bought?
        c. **Waar** dink jy <u>waar</u> het sy Piet t gesien?
            Where think you where has she Piet seen
            Where do you think she has seen Piet?
        d. **Hoekom** dink jy <u>hoekom</u> het Jan Marie t vermoor?
            why   think you why   has Jan Marie murdered
            Why do you think that Jan murdered Marie?
        e. **Waarvoor** dink julle <u>waarvoor</u> werk ons t?
            what.for   think you what.for   work we
            What do you think we are working for?

                                                            (Plessis 1977, ex. 8)

It is unbounded:

(30)   a. **Waaroor** dink jy <u>waaroor</u> dink die bure   <u>waaroor</u> stry ons die meeste t?
            what.about think you what.about think the neighbors what.about argue we the most
            What do you think the neighbors think we are arguing about the most?

---

[2] Unless indicated otherwise, the data cited in this section were provided by Theresa Biberauer (p.c., 2008/03/07).

b. **Met wie** het jy   nou weer gesê <u>met wie</u> het Sarie gedog <u>met wie</u> gaan Jan t trou?
with who have you now again said with who has Sarie thought with who go Jan   marry
Whom did you say again Sarie thought Jan is going to marry?

(Plessis 1977, ex. 10 & ex. 11)

It is island-sensitive:

(31)   a.* **Wie** dink jy   <u>wie</u> het die man besluit [s nadat hy t ontmoet het]?
who think you who has the man decided after he   met   has
Who do you think the man has decided after having met?
b.* **Wie** dink jy   <u>wie</u> is [s om   t te ontmoet] pret?
who think you who is   in.order to.meet   fun
Who do you think is to meet fun?

It allows intervening negation:

(32)   **Wie** dink jy   nie <u>wie</u> het sy t gesien nie?
who think you not who has she seen   not
Who don't you think she has seen?

And it allows the co-occurrence of the resuming element with a complementizer:

(33)   **Wie** dink jy   <u>wie</u> dat Marie t lief   het?
who think you who that Marie sweet has
Who do you think Marie loves?

However, in sharp contrast to both varieties of German, Afrikaans puts no restriction on the complexity of the resuming element, and even requires full identity between the extracted element and the resuming element. This holds for both NPs and PPs, and even for NPs modified by adjectives.

(34)   a.   **Watter man** dink jy   <u>watter man</u> sy t lief het?
which   man think you which man she sweet has
Which man do you think she loves?
b.   **Van watter vrou** het jy gedink <u>van watter vrou</u> het hulle gister   t gepraat?
of   which woman have you thought of   which woman have they   yesterday   talked
Which woman do you think they talked about yesterday?
b.   **Met watter meisie** het jy gesê <u>met watter meisie</u> wil   Jan t trou?
with which girl   have you said with which girl   wants John marry
Which girl do you say John wants to marry?
c.   **Watter mooi   meisie** sê   hy <u>watter mooi   meisie</u> kom   vanaand t kuier?
which beautiful girl   says he which beautiful girl   comes tonight   visit
Which beautiful girls did he say is coming to visit tonight?

(Lohndal 2010, exx. 14-16, reporting Theresa Biberauer's judgments)

And in contrast to the liberal variety of German which requires the replacement of the complex wh-phrase functioning as a resuming element by a proform, Afrikaans disallows this.

(35) ***Watterman** dink jy <u>wie</u> sy t lief   het?
     Which man think you who she sweet has
     Which man do you think she loves?

In order to deal with this pattern, and especially with the contrast between (35) and (34a), I suggest that Afrikaans does not permit replacement in wh-copying structures, but simply reflects the option of having *unerased 30-arcs*. The existence of this option is actually expected given the analysis for extraction from chapter 6. That follows because as pointed out there, the laws regulating the presence and properties of 30-arcs do not specify the erasure properties of 30-arcs; the erasure properties are specified by language particular rules. And whereas German and Eastern Armenian require their 30-arcs to be successors-I and successors-II (cf. section 3 of chapter 7), respectively, Afrikaans requires them to be successors-III, that is, Afrikaans requires them to be unerased. The rule specifying this is formulated in (36), and the structure for .the sentence in (34a) satisfying it in (37).

(36)   *30-Arc = Successor-III Rule*
        30-Arc (A) → ∃B (F-Successor-III (A,B))

(37)
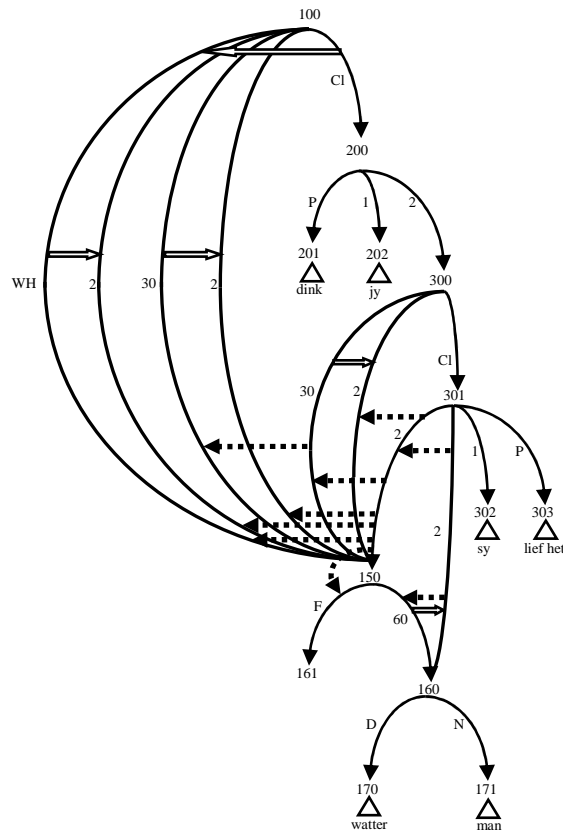
This structure differs from wh-copying structures in German in that the 30-arc in the matrix clause does not erase the 30-arc in the embedded clause. Since the 30-arcs are surface arcs, the elements heading them are spelled out.

Although this rule gives the right result for the non-erasure of the relevant 30-arc, it has the disadvantage that it equally predicts the starter to be unerased. This is problematic though because then the structure in (37) will result in the following sentence.

(38) * **Watter man** dink   jy   <u>watter man</u> sy (watter man) lief   het?
          which   man think you which man she which man sweet has
          Which man do you think she loves?

Since the starter is unerased, the element heading it is spelled out, resulting in the additional realization of the wh-element in its base position, which is however ungrammatical in Afrikaans. In order to cope with this problem, I suggest that the following law is at work.

(39)   *The Starter Erasure Law*
        Starter (A) → ∃B (Successor (B,A) ∧ Linked-Erase (A,B))

This law mentions a yet undefined predicate, viz. Linked; its definition is provided in (40).

(40)   Def.: *Linked-R*[3]
        Given any binary relation R between two arcs A and B, R(A,B), then
        Linked-R ↔ R(A,B) ∨ R(B,A)

Replacing the variable over relations (viz. R) in (40) by the relation Erase, Linked-Erase then specifies a relation between two arcs A and B such that either A erases B or B erases A. Consequently, the Starter Erasure Law requires any starter to either erase, or to be erased by, some successor. This law is violated in (37) because the starter is not erased nor does it erase any arc. In order to obtain compatibility with this law, the structure needs to be modified in the following way.

---

[3] Cf. Johnson & Postal 1980, p. 142.

(41)
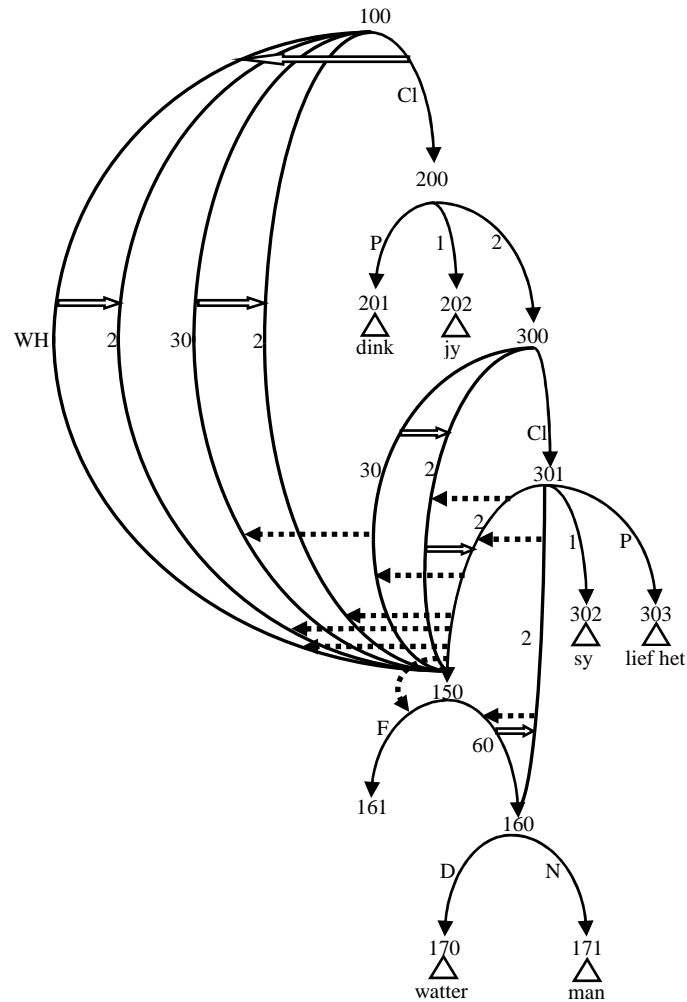
In this structure, the Starter Erasure Law is satisfied because the starter is Linked-Erased: it is erased by a relational marker. Importantly, given all other laws, it is only possible for the starter to be erased, and not to erase some arc, and it is only possible for a relational marker to erase the starter. Consider the first point, that the starter must not erase some successor. The set of successors of the starter contains (i) the WH-arc, (ii) the 30-arcs, and (iii) the relational markers. The starter must not erase the WH-arc because it is a proper-overlay-arc, and those are required to be successors-III, that is, successors that are neither erased by nor erasers of their predecessors (cf. the Proper-Overlay-Arc Predecessor Law formulated in chapter 6). For the same reason, the starter must not erase the 30-arcs either because these too are required to be successors-III by the rule in (36). Lastly, the starter must not erase any relational marker because they already have an eraser, viz. their accompanying overlay-arcs, and no arc has more than one eraser. Regarding the second issue, that

the starter can only be erased by the relational marker, this follows from the same considerations. The WH-arc and the 30-arc successor of the starter must not erase the starter because they have to be successors-III, that is, they must not erase their predecessor, which is the starter. The WH-arc is always a successor-III of the starter (given the Proper-Overlay-Arc Predecessor Law) and such successors must never erase predecessors, that is, the starter in this case. The 30-arc must also be a successor-III given (36) so that cannot erase its predecessor, which happens to be the starter again, either. The relational marker however is not subject to such a restriction and can therefore erase the starter, as indicated in the structure in (37)[4].

Lastly, I show that the Starter Erasure Law is compatible with the other types of extractions mentioned in this thesis. First, in a language like German, it is trivially satisfied by the erasure properties of 30-arcs because German 30-arcs are required to erase their predecessors in general and therefore the starter in particular. Second, in type 1 in situ languages like Eastern Armenian, where 30-arcs are erased by their predecessors, the law is also satisfied. Moreover, it is not possible in such languages that the relational marker also erases the starter, as shown in (42).

(42)
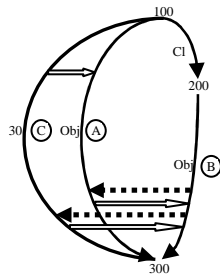
In this structure, the relational marker A erases the starter B, and B erases the 30-arc C. Apart from the unwelcome consequence that this kind of extraction would result in a structure where no extracted element at all is present, this structure violates a fundamental law on sentence structure, given in (43).

(43)   *The Remote Erasure Law*[5]
        Erase (A,B) → ¬R-Erase (B,A)

This law excludes inter alia situations where an arc A erases another arc B if B erased some arc C which itself erased A. But the structure in (42) with the indicated erasure properties violates this law: the relational marker A erases the starter B, and B R-erases A, viz. via the 30-arc C. Third, in type 2 in situ languages like Malay, this law is trivially satisfied too because such languages don't have starters to begin with, and therefore the law is satisfied vacuously.

In sum, Afrikaans possesses a wh-copying pattern where 30-arcs are unerased so that the resuming element is necessarily identical to the extracted element.

---

[4] In fact, every relational marker of a starter is a licit eraser in Afrikaans because they are all successors of the starter.
[5] Cf. Postal 2010, p. 95 and Johnson & Postal 1980, p. 505.

8.4   A General Characterization of Wh-Copying

The last issue I address in this chapter is whether a general characterization of wh-copying is possible, that is, a characterization compatible with all the variation documented in this chapter. I claim that such a characterization can be achieved. More specifically, I suggest the following characterization.

(44)   *Wh-Copying-Clause* ↔ ∃A∃B∃C (Cl-Arc (A) ∧ 30-Arc (B) ∧ R-Second (B,C) ∧ Quasi Surface Arc (C) ∧ Neighbor (A,B,C))

This characterization mentions a type of arc not defined so far, viz. *Quasi Surface Arc*; the definition for this type of arc is given in (45).

(45)   Def.: *Quasi Surface Arc*
        Quasi Surface Arc (A) ↔ ∃B (Surface Arc (B) ∧ R-Replace (B,A))

The characterization in (44) says that any clause counts as an instance of wh-copying if there is a Cl-arc A that is a neighbor of a 30-arc B that R-seconds a neighboring quasi surface arc C. Given the reflexivity of any relation prefixed by 'R', this characterization is compatible with two situations. Either the 30-arc B is C, or the 30-arc B seconds a distinct arc C, which means that C is a replacer. These are illustrated in (46) and (47).
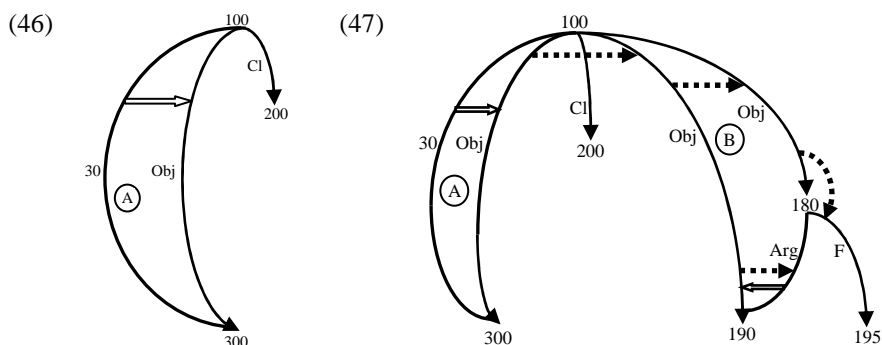
The structure (46) illustrates the first situation, where B is C. This situation is the one found in Afrikaans where the 30-arc itself is overtly realized. Structure (47) depicts the second situation where C is a replacer. This situation is the one found in both varieties of German, where the resuming element is a replacer, even though this replacer is subject to an additional restriction in the restrictive variety of German.
Importantly, the restriction that C is a neighbor of B excludes all cases of resumptive proforms, as these are also seconded by a 30-arc (cf. section 2 of chapter 7). That C is a quasi surface arc has two desirable effects. First, it precludes extraction structures in general from counting as wh-copying structures. For although all extraction structures contain a 30-arc, only when it surfaces, as in Afrikaans, does

the structure count as a wh-copying structure. Second, it rules in the structure in (47) as wh-copying. Consider an alternative formulation of (44) where arc C is required to be a surface arc only. This alternative formulation is still compatible with the structure in (46) because the 30-arc *is* a surface arc (as it lacks an eraser). However, in (47), the relevant arc C is not a surface arc because it *is* erased, viz. by the Arg-arc (this erasure follows from the laws and rules governing flagging specified in chapter 6 requiring C to be replaced again). But given the formulation in (44), this state of affairs creates no problem: although C is not a surface arc, it is quasi surface arc because it is replaced by a surface arc, viz. the Obj-arc neighboring it.

Informally speaking, what the characterizations in (44) then guarantees is that any structure counts as a wh-copying structure if it either contains *an additionally spelled-out instance of the extracted element* in intermediate position or if it contains *a pronominal copy of the extracted element* in intermediate position.

8.5   Summary

In this chapter, I have considered the variation of wh-copying structures both within German and cross-linguistically. First, I presented data from a restrictive wh-copying variety in German where complex wh-phrases are not permitted as extracted elements and d-proforms cannot be resuming elements. It was argued that both differences stem from a single factor: the restrictive variety demands identity for the elements heading the D-arcs of the extracted element and the resuming element. Consequently, this restriction can be satisfied only by those structures where the element heading the D-arc is compatible both with an interrogative function and with a function as a free relative proform. This excludes (most) complex wh-phrases because their determiners are illicit as free relative proforms; and it excludes d-proforms as they are incompatible with an interrogative function. In sum, only wh-proforms are permitted, which is precisely what one finds in the restrictive variety. Second, I turned to Afrikaans and argued that the resuming element does not head a replacer arc but an unerased 30-arc so that the resuming element is in fact identical to the extracted element. It was argued that this pattern is captured by analyzing the resuming element as an unerased 30-arc. Lastly, I attempted to reconstruct the notion 'wh-copying' in formal terms, that is, I tried to provide a characterization of wh-copying that is compatible with the attested variability of wh-copying structures. The characterization I arrived at says that any structure counts as a wh-copying structure if it either contains an additionally spelled-out instance of the extracted element in intermediate position or if it contains a pronominal copy of the extracted element in intermediate position, thereby capturing both the two pattern found in German and the one in Afrikaans.

Chapter 9

Conclusions

9.1   General Conclusions

Based on the results of the preceding chapters, three general conclusions can be drawn.

First, wh-copying in German, illustrated in (1), is a characterized in a way that has gone unnoticed so far.

(1)   **Wen** glaubst du <u>wen</u> sie liebt?
        who believe you who she loves
        Who do you think she loves?

The resuming element appearing in that construction (the element underlined in (1)) is a separate element, and more specifically, a pronominal. It is not – as generally assumed – a copy of the real wh-phrase (the element set in bold in (1)). This independence becomes visible in examples involving complex wh-phrases as the real wh-phrase, cf. (2).

(2)   **Welchen Mann** glaubst du   <u>wen</u> sie liebt?
        which   man   believe you who she loves
        Which man do you think she loves?

Despite this independence, the resuming element is nevertheless subject to constraints requiring matching in a number of features between it and the real wh-phrase. In sum, the first conclusion that one has to draw is that the resuming element is only indirectly linked to the real wh-phrase, and that it is not a direct realization of the real wh-phrase.

Second, in order to successfully analyze this indirect linkage between the real wh-phrase and the resuming element, one needs to have recourse to two special analytic devices. The first device is some sort of a pronominalization operation, that is, an operation that treats pronominals as place-holders for full phrases. The second device is the treatment of grammatical relations as primitives, that is, as undefined entities (for example via positions in the tree). The first device allows one to treat

the resuming element as a result of pronominalization, whereas the second one allows one to give single description of the matching conditions. For they can be treated as a requirement for the resuming element to be relationally equivalent to the grammatical relation borne by real wh-phrase prior to its extraction. As the framework of Arc Pair Grammar makes both devices available, I choose it for my analysis.

Third, the analysis developed in this chapter couched within the APG framework is not only successful for the analysis of wh-copying in German, it can also deal with the variation found in wh-copying structures, for example with wh-copying in Afrikaans. Moreover, it can be employed in the analysis of a number of phenomena that are completely independent of wh-copying, like successive cyclicity effects, island sensitive *wh in situ* constructions, wh-agreement effects, or complementizer alternations. In addition to this, a number of controversial claims made within APG can be shown to crosslinguistically valid, for example the uniform treatment of case and adpositional marking, or the idea that proforms are placeholders.

9.2   Specific Conclusions

In the course of my investigation of the wh-copying construction in German, I tried to answer the four questions summarized in (3).

(3)   a. What is status of wh-copying in comparison to other types of wh-question extraction found in German?
         b. What are the morphosyntactic properties of the resuming element?
         c. Is a uniform analysis of the resuming element possible?
         d. Would such an analysis have to rely on ad hoc technical machinery?

Starting with question (3a), I have argued in chapter 2 that wh-copying has the status of a regular wh-question extraction, that is, it behaves in all respect like the regular types of wh-question extraction shown in (4), and not like the more peculiar type dubbed WHAT-construction, illustrated in (5).

(4)   a. Wen glaubst du   dass die Ministerin liebt?
             who believe you that   the minister   loves
         b. Wen glaubst du   liebt die Ministerin t?
             who believe you loves the minister
             Who do you think the minister loves?

(5)   Was glaubst du   wen die Ministerin liebt?
         what believe you who the minister   loves
         Who do you think the minister loves?

The relevance of this result is that since wh-copying patterns in all respects like the other regular extraction types, its peculiarity is the presence of some extra element,

viz. the resuming element. Consequently, any successful analysis of wh-copying has to deal with both the presence and the properties of the resuming element.

With regard to the second question, (3b), I have shown on the basis of mainly new data in chapter 2, that the resuming element is characterized in a way that has gone unnoticed so far in the literature. In particular, although the name 'wh-copying' suggests that the resuming element is simply a copy of the real wh-phrase, this is arguably not the case. The data presented in chapter 2 show that the resuming element is a proform, that is, it has some pronominal core. Importantly, this is independent of the status of the real wh-phrase, which can phrasal for some speakers of wh-copying. In addition to this, it was shown that the resuming element is taken from a well-defined set of proforms, viz. from the set of free relative proforms. Morover, the resuming element is subject to a number of matching restrictions in connection to the real wh-phrase. The most important of these matching restrictions is that the resuming element has to bear the same case and adpositional marking as the real wh-phrase, as illustrated in (6).

(6) a. **Wen** glaubst du <u>wen</u> er die lateinische Sprache lehren wird?
      who.ACC believe you who.ACC he the Latin language teach will
  b.* **Wen** glaubst du <u>wem</u> er die lateinische Sprache lehren wird?
      who.ACC believe you who.DAT he the Latin language teach will
      Who do you believe he teaches the Latin language?
  c. **An wen** denkst du <u>an wen</u> sie einen Brief schreibt?
      on who.ACC believe you on who.ACC she a letter writes
  d.* **An wen** denkst du <u>wem</u> sie einen Brief schreibt?
      on who.ACC believe you who.DAT she a letter writes
      Who do you think she writes a letter to?

The relevance of this result is that although the resuming element is not fully identical to the real wh-phrase, it has to be partially identical – in some sense – to the real wh-phrase. The task of any analysis is to explicate this identity requirement.

Concerning the third question, (3c), it turns out that the partial identity requirement is hard to reconcile with the existing analyses and the tools they employ. As I argue in more detail in chapter 4, most analyses either fail to capture the status of the resuming element as a proform or its matching properties regarding case and appositional marking. The only analysis that has the potential to account for the properties of the resuming element is one that treats it literally as a partial copy of the real wh-phrase. More specifically, this analysis captures the properties of the resuming element by analyzing it as a version of the real wh-phrase that has been affected by a number of deletion operations. The problem with this idea however is that the specific deletion operations needed are purely *ad hoc*, that is, nothing motivates these and only these deletion operations.

Despite this negative conclusion, chapter 5 and 6 are devoted to show that a non *ad hoc* analysis is achievable, and more specifically, that the framework of Arc Pair Grammar allows one to formulate such an analysis. In other words, APG allows one to capture both the fact that the resuming element is a proform and the fact that it is subject to the matching restrictions that one observes. In spite of the length of the chapters presenting the analysis, the gist of the analysis can be shortly summarized.

The main idea behind the analysis is that the resuming element is not an impoverished version of the real wh-phrase but *a separate element*. The reason this element shows up as a proform has to with the fact that the conditions regulating the presence of the resuming element in extraction contexts are *the same that regulate the presence of proforms in APG in general*. In other words, if a separate element is permitted in wh-copying, then it can only be a proform. The reason this element bears the same case and adpositional marking is a consequence of yet another special idea of APG, viz. its recognition of grammatical relations as primitives of a syntactic theory. What this view allows is a rather trivial analysis of the agreement facts for case and adpositional marking. *Both the resuming element and the real wh-phrase keep track of the grammatical relation of the extracted element before it underwent extraction*. Since grammatical relations determine case and adpositional marking, the fact that both the real wh-phrase and the resuming element agree in these markings is then simply a consequence of this record. As for the choice of the specific proform, that the resuming element is taken from the set of free relative proforms was shown to follow from the conditions the set of free relative proforms is subject to.

Note that the first two analyses are hard to translate into frameworks lacking the specific assumptions of APG. I am aware of no other framework that predicts any connection whatsoever between proforms and extraction contexts, nor can the conservation of grammatical relations be easily translated. This is so because all other frameworks known to me define grammatical relations via positions in the tree. But the position of the resuming element, the position of the real wh-phrase before extraction, and the position of the real wh-phrase after extraction are all distinct.

Lastly, turning to (3d), although the analysis relies mainly on general assumptions provided by the APG framework, it puts them together in a very specific way. For example, some mechanism is needed that preserves the relational status of the real wh-phrase prior to extraction, and another mechanism is needed determines the position of the resuming element. Finally, nothing has been said about the claim that case and adpositional marking are related to each other nor has the claim that extraction contexts resemble other contexts where proforms appear been given any justification. So one might suspect that the analysis I developed relies on an *ad hoc* combination of the tools provided by APG. I argued in chapter 7 is that such skepticism is not warranted. To the contrary, the specific analyses proposed in chapter 6 allow insights into phenomena that are completely unrelated to wh-copying. In particular, I aim to show that extraction contexts and contexts where proforms appear share a common configuration, and that this allows one to deal with a number of unexpected proforms, for example with reflexives as morphological reflexes of passivization. I also argued that my treatment of extraction and the way the grammatical relation of the real wh-phrase is preserved allows a unified treatment of wh-agreement and complementizer alternations effects, the most famous one of which is the that-trace effect. In addition, the analysis needed for the position of the resuming element allows a simple treatment of successive cyclicity effects and island sensitive *wh in situ* constructions. Finally, the chapter showed that case and adpositional marking show crosslinguistically the same properties, which finding supports the claim that they are identical.

Appendix

Definition: Metagraph

A *metagraph M* is a 9-ary set $\{N_M, NL_M, E_M, EL_M, F_M, F_{NLM}, F_{ELM}, \text{P-Sponsor}_M, \text{P-Erase}_M\}$, where

N_M is a finite, nonempty set, the set of nodes

NL_M is a finite, nonempty set, the set of node labels

E_M is a finite, nonempty set, the set of edges

EL_M is a finite, nonempty set, the set of edge labels

$F_M: E_M \rightarrow N_M \times N_M$, the function assigning an ordered pair of nodes to each edge

$F_{NLM}: N_M \rightarrow NL_M$, the function assigning node labels to nodes

$F_{ELM}: E_M \rightarrow EL_M$, the function assigning edge labels to edges

$\text{P-Sponsor}_M \subseteq E_M \times E_M$, a binary relation between edges

$\text{P-Erase}_M \subseteq E_M \times E_M$, a binary relation between edges

Def.: *Disjointness Condition*

$\forall M \; \forall N_M \; \forall NL_M \; \forall E_M \; \forall EL_M \; ((N_M \cap (NL_M \cap (E_M \cap EL_M))) = \varnothing)$

Def.: *R-Graph$_M$*

$\forall M \; \forall x,y \in N_M \; \forall \alpha \in E_M \; \forall a,b \in NL_M \; \forall GR_x \in EL_M \; (\langle a,b,GR_x \rangle \in \text{R-Graph}_M \leftrightarrow F_M(\alpha) = \langle x,y \rangle \wedge F_{NLM}(x) = a \wedge F_{NLM}(y) = b \wedge F_{ELM}(\alpha) = GR_x)$

Def.: *Tail-of-Arc: R-Graph$_M$ $\rightarrow$ NL$_M$*

$\forall A \in \text{R-Graph}_M \; \forall a,b \in NL_M \; \forall GR_x \in EL_M \; ((\text{Tail-of-Arc } (A) = a) \leftrightarrow (A = \langle a,b,GR_x \rangle))$

Def.: *Head-of-Arc: R-Graph$_M$ $\rightarrow$ NL$_M$*

$\forall A \in \text{R-Graph}_M \; \forall a,b \in NL_M \; \forall GR_x \in EL_M \; ((\text{Head-of-Arc } (A) = b) \leftrightarrow (A = \langle a,b,GR_x \rangle))$

Def.: *Endpoint-of-Arc: R-Graph$_M$ $\rightarrow$ $\wp NL_M$*

$\forall A \in \text{R-Graph}_M \; a,b \in NL_M \; GR_x \in EL_M \; (\text{Endpoint-of-Arc } (A) = \{a,b\} \leftrightarrow (A = \langle a,b,GR_x \rangle))$

Def.: *Name-of-Arc: R-Graph$_M$ $\rightarrow$ EL$_M$*

$\forall A \in \text{R-Graph}_M \; \forall a,b \in NL_M \; \forall GR_x \in EL_M \; ((\text{Name-of-Arc } (A) = GR_x) \leftrightarrow (A = \langle a,b,GR_x \rangle))$

Def.: *Edge-of-Arc: R-Graph$_M$ $\rightarrow$ E$_M$*

$\forall A \in \text{R-Graph}_M \; \forall \alpha \in E_M \; \forall GR_x \in EL_M \; ((\text{Edge-of-Arc } (A) = \alpha) \leftrightarrow (\text{Name-of-Arc } (A) = GR_x) \wedge F_{ELM}(\alpha) = GR_x)$

Def.: *Govern $\subseteq NL_M \times NL_M$*
$\forall a,b \in NL_M$ $\forall A \in$ R-Graph$_M$ (Govern (a,b) $\leftrightarrow$ (Tail-of-Arc (A) = a) $\wedge$ (Head-of-Arc (A) = b))

Def.: *Attached $\subseteq R\text{-}Graph_M \times R\text{-}Graph_M$*
$\forall A,B \in$ R-Graph$_M$ (Attached (A,B) $\leftrightarrow$ Endpoint-of-Arc (A) = Endpoint-of-Arc (B))

Def.: *Overlap $\subseteq R\text{-}Graph_M \times R\text{-}Graph_M$*
$\forall A,B \in$ R-Graph$_M$ (Overlap (A,B) $\leftrightarrow$ Head-of-Arc (A) = Head-of-Arc (B))

Def.: *Kiss $\subseteq R\text{-}Graph_M \times R\text{-}Graph_M$*
$\forall A,B \in$ R-Graph$_M$ (Kiss (A,B) $\leftrightarrow$ Overlap (A,B) $\wedge$ $\neg$Neighbor (A,B))

Def.: *Neighbor $\subseteq R\text{-}Graph_M \times R\text{-}Graph_M$*
$\forall A,B \in$ R-Graph$_M$ (Neighbor (A,B) $\leftrightarrow$ Tail-of-Arc (A) = Tail-of-Arc (B))

Def.: *Colimb $\subseteq R\text{-}Graph_M \times R\text{-}Graph_M$*
$\forall A,B \in$ R-Graph$_M$ (Colimb (A,B) $\leftrightarrow$ $\neg$(Overlap (A,B)) $\wedge$ Neighbor (A,B))

Def.: *Parallel $\subseteq R\text{-}Graph_M \times R\text{-}Graph_M$*
$\forall A,B \in$ R-Graph$_M$ (Parallel (A,B) $\leftrightarrow$ Overlap (A,B) $\wedge$ Neighbor (A,B))

Def.: *Branch $\subseteq R\text{-}Graph_M \times R\text{-}Graph_M$*
$\forall A,B \in$ R-Graph$_M$ (Branch (A,B) $\leftrightarrow$ Tail-of-Arc (A) = Head-of-Arc (B))

Def.: *GR_x-Arc (A)*
$\forall A \in$ R-Graph$_M$ $\forall a,b \in NL_M$ $\forall GR_x \in EL_M$ (GR_x-Arc (A) $\leftrightarrow$ (Name-of-Arc (A) = GR_x))

Def.: *Equivalent $\subseteq R\text{-}Graph_M \times R\text{-}Graph_M$*
$\forall A,B \in$ R-Graph$_M$ (Equivalent (A,B) $\leftrightarrow$ Name-of-Arc (A) = Name-of-Arc (B))

Def.: *Sponsor (A,B)*
$\forall A,B \in$ R-Graph$_M$ $\forall \alpha,\beta \in E_M$ (Sponsor (A,B) $\leftrightarrow$ ($\langle\alpha,\beta\rangle \in$ P-Sponsor$_M$) $\wedge$ (Edge-of-Arc (A) = α) $\wedge$ (Edge-of-Arc (B) = β))

Def.: *Erase (A,B)*
$\forall A,B \in$ R-Graph$_M$ $\forall \alpha,\beta \in E_M$ (Erase (A,B) $\leftrightarrow$ ($\langle\alpha,\beta\rangle \in$ P-Erase$_M$) $\wedge$ (Edge-of-Arc (A) = α) $\wedge$ (Edge-of-Arc (B) = β))

Def.: *S-Graph$_M$*
$\forall A \in$ R-Graph$_M$ (A $\in$ S-Graph$_M$ $\leftrightarrow$ $\neg$($\exists B \in$ R-Graph$_M$ (Erase (B,A)))

Def.: *L-Graph$_M$*
$\forall A \in$ R-Graph$_M$ (A $\in$ L-Graph$_M$ $\leftrightarrow$ $\neg$($\exists B \in$ R-Graph$_M$ (Sponsor (B,A)))

References

Abney, Steven P. 1987. *The English noun phrase in its sentential aspect:* MIT PhD Thesis.

Abraham, Werner (ed.) (1985). *Erklärende Syntax des Deutschen*. Tübingen: Günter Narr.

Abuladze, Lia & Andreas Ludden. 2006. *Lehrbuch der georgischen Sprache*. Hamburg: Buske.

Adger, David. 2003. *Core syntax*: *A minimalist approach*. Oxford: OUP.

Aissen, Judith. 1987. *Tzotzil clause structure*. Dordrecht, Boston: D. Reidel.

Aissen, Judith L. & David M. Perlmutter. 1983. Clause Reduction in Spanish. In David M. Perlmutter (ed.), *Studies in relational grammar 1*, 360–403. Chicago: University of Chicago Press.

Alber, Birgit. 2008. Tyrolean A-bar movement: Doubling and resumptive pronoun structures. In Sjef Barbiers, Olaf Koeneman, Marika Lekakou & Margreet van der Ham (eds.), *Microvariation in syntactic doubling*. 141–170. Bingley: Emerald Group Publ.

Alexandre, Nélia. 2012. *The defective copy theory of movement*: *Evidence from wh-constructions in Cape Verdean Creole*. Amsterdam: Benjamins.

Alexiadou, Artemis (ed.) (2002). *Dimensions of movement*: *From features to remnants*. Amsterdam: Benjamins.

Alexiadou, Artemis, Elena Anagnostopoulou & Martin Everaert (eds.) (2004). *The unaccusativity puzzle*: *Explorations of the syntax-lexicon interface*. Oxford: OUP.

Alexiadou, Artemis, Liliane M. V. Haegeman & Melita Stavrou. 2007. *Noun phrase in the generative perspective*. Berlin: De Gruyter.

Anderson, Gregory D. 2002. Case-marked clausal subordination in the Burushaski complex sentence. *Studies in Language* 26(3). 543–571.

Anderson, Stephen R. & Paul Kiparsky (eds.) (1973). *A Festschrift for Morris Halle*. New York: Holt, Rinehart and Winston.

Andersson, Sven-Gunnar & Sigmund Kvam. 1984. *Satzverschränkung im heutigen Deutsch*: *Eine syntaktische und funktionale Studie unter Berücksichtigung alternativer Konstruktionen*. Tübingen: Günter Narr.

Andrews, Avery D. 1990. The VP-Complement Analysis in Modern Icelandic. In Joan Maling & Annie Zaenen (eds.), *Modern Icelandic Syntax*, 165–185. San Diego: Academic Press.

Antomo, Mailin & Markus Steinbach. 2010. Desintegration und Interpretation: Weil-V2-Sätze an der Schnittstelle zwischen Syntax, Semantik und Pragmatik. *Zeitschrift für Sprachwissenschaft* 29(1). 1–37.

Anyadi, Stefanie & Armine Tamrazian. 1993. Wh-movement in Armenian and Ruhr German. *UCL Working papers in Linguistics* 5. 1–22.

Asbury, Anna. 2008. *The morphosyntax of case and adpositions*. Utrecht: LOT.

Asudeh, Ash. 2011. Towards a unified theory of resumption. In Alain Rouveret (ed.), *Resumptive pronouns at the interfaces*, 121–187. Amsterdam: Benjamins.

Axel-Tober, Katrin. 2012. *(Nicht-)kanonische Nebensätze im Deutschen synchrone und diachrone Aspekte*. Berlin: De Gruyter.

Bach, Emmon. 1970. Problominalization. *Linguistic Inquiry* 1(1). 121–122.

Bach, Emmon & Robert T. Harms (eds.) (1968). *Universals in linguistic theory*. New York: Holt, Rinehart and Winston.

Baker, Marc C. & Ruth Kramer. to appear. "Prepositions" as case morphemes inserted at PF in Amharic. In Dany Jaspers (ed.), *Case at the Interfaces*.

Barbiers, Sjef, Olaf Koeneman & Marika Lekakou. 2010. Syntactic doubling and the structure of wh-chains. *Journal of Linguistics* 46(1). 1–46.

Barbiers, Sjef, Olaf Koeneman, Marika Lekakou & Margreet van der Ham (eds.) (2008). *Microvariation in syntactic doubling*. Bingley: Emerald Group Publ.

Barlow, Michael & Charles A. Ferguson (eds.) (1988). *Agreement in natural language*: *Approaches, theories, descriptions*. Stanford: CSLI.

Bayer, Josef. 1984. COMP in bavarian syntax. *The Linguistic Review* 3(3). 209–274.

Behaghel, Otto. 1923. *Deutsche Syntax - Eine geschichtliche Darstellung 1. Die Wortklassen und Wortformen, A. Nomen, Pronomen*. Heidelberg: Carl Winter.

Behaghel, Otto. 1928. *Deutsche Syntax - Eine geschichtliche Darstellung 3. Die Satzgebilde*. Heidelberg: Carl Winter.

Belletti, Adriana, Luciana Brandi & Luigi Rizzi (eds.) (1981). *Theory of markedness in generative grammar*: *Proceedings of the 1979 Glow Conference*. Pisa: Scuola Normale Superiore di Pisa.

Berg, Helma v. d. 2004. Hunzib (North-East Caucasian). In Geert Booij, Christian Lehmann, Joachim Mugdan & Stavros Skopeteas (eds.), *Morphologie. 2. Halbbd. ein internationales Handbuch zur Flexion und Wortbildung*, 1367–1375. Berlin: De Gruyter.

Besten, Hans d. 1989. *Studies in West Germanic Syntax*. Amsterdam: Rodopi.

Bhaskararao, Peri & Karumuri V. Subbarao (eds.) (2004). *Non-nominative subjects*: *Volume 2*. Amsterdam: Benjamins.

Bittner, Maria & Ken Hale. 1996. The Structural Determination of Case and Agreement. *Linguistic Inquiry* 27(1). 1–68.

Blake, Barry. 2001. *Case*, 2nd edn. Cambridge: CUP.

Blake, Barry. 2004. Case. In Geert Booij, Christian Lehmann, Joachim Mugdan & Stavros Skopeteas (eds.), *Morphologie. 2. Halbbd. ein internationales Handbuch zur Flexion und Wortbildung*, 1073–1090. Berlin: De Gruyter.

Blake, Barry, Anna Siewierska & Jae J. Song (eds.) (1998). *Case, typology and grammar*: *In honor of Barry J. Blake*. Amsterdam: Benjamins.

Błaszczak, Joanna & Susann Fischer. 2001. *Multiple Wh-Konstruktionen im Slavischen*: *State of the art report*. Potsdam: Universitätsbibliothek, Publikationsstelle.

Blatz, Friedrich. 1896. *Neuhochdeutsche Grammatik mit Berücksichtigung der historischen Entwicklung der deutschen Sprache*: *Band 2: Satzlehre (Syntax)*, 3rd edn. Karlsruhe: Lang.

Boeckx, Cedric. 2008. *Understanding minimalist syntax*: *Lessons from locality in long-distance dependencies*. Malden, Mass.: Blackwell.

Boeckx, Cedric, Norbert Hornstein & Jairo Nunes. 2009. Copy-reflexive and copy-control constructions: A movement analysis. *Linguistic Variation Yearbook* 8(1). 61–99.

Booij, Geert, Christian Lehmann & Joachim Mugdan (eds.) (2000). *Morphologie*: *Morphology : ein internationales Handbuch zur Flexion und Wortbildung : an international handbook on inflection and word-formation*. Berlin: De Gruyter.

Booij, Geert, Christian Lehmann, Joachim Mugdan & Stavros Skopeteas (eds.) (2004). *Morphologie. 2. Halbbd. ein internationales Handbuch zur Flexion und Wortbildung*. Berlin: De Gruyter.

Borer, Hagit (ed.) (1986). *The syntax of pronominal clitics*. Orlando: Academic Press.

Borsley, Robert, Maggie Tallerman & David Willis. 2007. *The Syntax of Welsh*. Cambridge: CUP.

Bosch, Peter, Tom Rozario & Yufan Zhao. 2003. Demonstrative Pronouns and Personal Pronouns: German DER vs. ER. *Proceedings of EACL* 10.

Boskovic, Zeljko & Jairo Nunes. 2007. The copy theory of movement: A view from PF. In Norbert Corver & Jairo Nunes (eds.), *The copy theory of movement*, 13–74. Amsterdam: Benjamins.

Bossong, Georg. 1985. *Empirische Universalienforschung*: *Differentielle Objektmarkierung in den neuiranischen Sprachen*. Tübingen: Günter Narr.

Brandner, Ellen. 2000. Scope Marking and Clausal Typing. In Uli Lutz, Gereon Müller & Arnim v. Stechow (eds.), *Wh-scope marking*, 45–75. Amsterdam: Benjamins.

Brentari, Diane, Gary N. Larson & Lynn A. MacLeod (eds.) (1992). *The Joy of grammar*: *A Festschrift in honor of James D. McCawley*. Amsterdam: Benjamins.

Bresnan, Joan. 2001. *Lexical-functional syntax*. Malden, Mass: Blackwell.

Broekhuis, Hans, Norbert Corver, Riny Huybregts, Ursula Kleinhenz & Jan Koster (eds.) (2005). *Organizing grammar*: *Studies in honor of Henk van Riemsdijk* (Studies in generative grammar 86). Berlin: De Gruyter.

Bruening, Benjamin. 2004. Two Types of Wh-Scope Marking in Passamaquoddy. *Natural Language and Linguistic Theory* 22(2). 229–305.

Bruening, Benjamin. 2006. Differences between the Wh-Scope-Marking and Wh-Copy Constructions in Passamaquoddy. *Linguistic Inquiry* 37(1). 25–49.

Bruening, Benjamin & Thuan Tran. 2006. Wh-Questions in Vietnamese. *Journal of East Asian Linguistics* 15(4). 319–341.

Bruhn, Daniel W. 2007. *LF Wh-Movement in Mong Leng*. University of California, Berkeley.

Caha, Pavel. 2009. *The Nanonsyntax of Case*. Tromsø: University of Tromsø PhD Thesis.

Calabrese, Andreas. 1984. Multiple questions and focus in Italian. In Wim d. Geest (ed.), *Sentential complementation*, 67–74. Dordrecht: Foris.

Carnie, Andrew. 2012. *Syntax*: *A generative introduction*. Hoboken, New Jersey: Wiley-Blackwell.

Carstens, Vicki. 1985. Adjunct ECP effects in Yorùbá. *Proceedings of NELS* 15. 49–62.

Cheng, Lisa L. S. 2000. Moving Just the Feature. In Uli Lutz, Gereon Müller & Arnim v. Stechow (eds.), *Wh-scope marking*, 77–100. Amsterdam: Benjamins.

Cheng, Lisa L. S. & Norbert Corver (eds.) (2006). *Wh-movement*: *Moving on*. Cambridge, Mass: MIT Press.

Cheng, Lisa L. S. & R. P. E. Sybesma (eds.) (2003). *The second Glot international state-of-the-article book*: *The latest in linguistics*. Berlin: De Gruyter.

Chomsky, Noam. 1965. *Aspects of the theory of syntax*. Cambridge, Mass: MIT Press.

Chomsky, Noam. 1995a. A Minimalist Theory for Linguistic Theory. In Noam Chomsky (ed.), *The minimalist program*, 167–217. Cambridge, Mass: MIT Press.

Chomsky, Noam (ed.) (1995b). *The minimalist program*. Cambridge, Mass: MIT Press.

Chomsky, Noam. 2000. Minimalist Inquiries: The Framework. In Howard Lasnik, Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by step*: *Essays on minimalist syntax in honor of Howard Lasnik*, 89–155. Cambridge, Mass: MIT Press.

Chomsky, Noam & Howard Lasnik. 1977. Filters and Control. *Linguistic Inquiry* 8(3). 425–504.

Chung, Sandra. 1982. Unbounded Dependencies in Chamorro Grammar. *Linguistic Inquiry* 13(1). 39–77.

Chung, Sandra. 1998. *The design of agreement*: *Evidence from Chamorro*. Chicago: University of Chicago Press.

Chung, Sandra & Carol P. Georgopoulos. 1988. Agreement with Gaps in Chamorro and Palauan. In Michael Barlow & Charles A. Ferguson (eds.), *Agreement in natural language*: *Approaches, theories, descriptions*, 251–267. Stanford: CSLI.

Cinque, Guglielmo. 1990. *Types of Ā-dependencies*. Cambridge, Mass: MIT Press.

Cinque, Guglielmo. 2010. *The syntax of adjectives*: *A comparative study*. Cambridge, Mass: MIT Press.

Citko, Barbara. 2011. *Symmetry in syntax*: *Merge, move, and labels*. Cambridge: CUP.

Cole, Jennifer, Georgia M. Green & Jerry L. Morgan (eds.) (1995). *Linguistics and computation*. Stanford: CSLI.

Cole, Peter & Gabriella Hermon. 1998. The Typology of Wh-movement: Wh-Questions in Malay. *Syntax* 1(3). 221–258.

Collins, Chris & Paul M. Postal. 2012. *Imposters*: *A study of pronominal agreement*. Cambridge, Mass: MIT Press.

Comrie, Bernard & Maria Polinsky. 1998. The great Daghestanian case hoax. In Barry Blake, Anna Siewierska & Jae J. Song (eds.), *Case, typology and grammar*: *In honor of Barry J. Blake*, 95–114. Amsterdam: Benjamins.

Coopmans, Peter, Martin Everaert & Jane B. Grimshaw (eds.) (2000). *Lexical specification and insertion*. Amsterdam: Benjamins.

Corbett, Greville G. 1995. Agreement. In Joachim Jacobs, Arnim v. Stechow, Wolfgang Sternefeld & Theo Venneman (eds.), *Syntax*: *2. Halbband*, 1235–1244. Berlin: De Gruyter.

Corbett, Greville G. 2000. *Number*. Cambridge: CUP.

Corver, Norbert & Jairo Nunes (eds.) (2007). *The copy theory of movement*. Amsterdam: Benjamins.

Culicover, Peter. 1993. Evidence against ECP Accounts of the that-t Effect. *Linguistic Inquiry* 24(3). 557–561.

Czepluch, Hartmut & Hero Janssen (eds.) (1984). *Syntaktische Struktur und Kasusrelation*. Tübingen: Günter Narr.

Dalrymple, Mary. 2001. *Lexical Functional Grammar* (Syntax and semantics 34). San Diego: Academic Press.

Davies, William & Carol G. Rosen. 1988. Unions as Multi-Predicate Clauses. *Language* 64(1). 52–88.

Déchaine, Rose-Marie & Martina Wiltschko. 2002. Decomposing Pronouns. *Linguistic Inquiry* 33(3). 409–442.

Demirdache, Hamida K. 1991. *Resumptive Chains in Restrictive Relatives, Appositives and Dislocation Structures*. Cambridge, Mass: MIT PhD Thesis.

Denham, Kristin. 2000. Optional Wh-Movement in Babine-Witsuwit'en. *Natural Language and Linguistic Theory* 18(2). 199–251.

Deprez, Viviane. 1992. Raising Constructions in Haitian Creole. *Natural Language and Linguistic Theory* 10(2). 191–231.

Diesing, Molly. 1992. *Indefinites*. Cambridge, Mass: MIT Press.

Dik, S. C. 1981. *Functional grammar*, 3rd edn. Dordrecht: Foris.

Dixon, Robert M. W. 1980. *The languages of Australia*. Cambridge: CUP.

Donaldson, B. C. 2008. *Dutch*: *A comprehensive grammar*, 2nd edn. London, New York: Routledge.

Doron, Edit. 1982. On the Syntax and Semantics of Resumptive Pronouns. *Texas Linguistics Forum* 19. 1–48.

Doron, Edit. 1986. The Pronominal "Copula" as Agreement Clitic. In Hagit Borer (ed.), *The syntax of pronominal clitics*, 313–332. Orlando: Academic Press.

Dum-Tragut, Jasmine. 2009. *Armenian*: *Modern Eastern Armenian*. Amsterdam: Benjamins.

Dyla, Stefan. 1981. *Evidence for Inversion in Polish and English*. Poznan: Uniwersytet im. Adama Mickiewicza PhD Thesis.

Dziwirek, Katarzyna, Patrick Farrell & Errapel Mejías-Bikandi (eds.) (1990). *Grammatical relations*: *A cross-theoretical perspective*. Stanford: CLSI.

Ebert, Robert, Oskar Reichmann & Klaus-Peter Wegera. 1993. *Frühneuhochdeutsche Grammatik*. Tübingen: Niemeyer.

Eckert, Rainer, Elvira-Julia Bukevičiūtė & Friedhelm Hinze. 1994. *Die baltischen Sprachen*: *Eine Einführung*. Leipzig, New York: Langenscheidt.

Emonds, Joseph E. 1985. *A unified theory of syntactic categories*. Dordrecht: Foris.

Engdahl, Elisabet & Eva Ejerhed. 1982. *Readings on unbounded dependencies in Scandinavian languages*. Umeå, Stockholm, Sweden: Universitetet i Umeå; Almqvist & Wiksell International.

Epstein, Samuel D. & T. D. Seely (eds.) (2002). *Derivation and explanation in the Minimalist Program*. Malden, MA: Blackwell Pub.

Erdmann, Oskar. 1886. *Grundzüge der deutschen Syntax nach ihrer geschichtlichen Entwicklung*: *Erste Abtheilung. Gebrauch der Wortklassen. Die Formationen des Verbums in einfachen Säzen und in Satzverbindungen*. Stuttgart: Cotta.

Everaert, Martin & Henk C. v. Riemsdijk (eds.) (2006). *The Blackwell companion to syntax*. Malden, MA: Blackwell Pub.

Everett, Daniel L. 2005. Cultural Constraints on Grammar and Cognition in Piraha: Another Look at the Design Features of Human Language. *Current Anthropology* 46(4). 621–634.

Everett, Daniel L. 2009. Piraha Culture and Grammar: A Response to Some Criticisms. *Language* 85(2). 405–442.

Fanselow, Gisbert. 2006. Partial Movement. In Martin Everaert & Henk C. v. Riemsdijk (eds.), *The Blackwell companion to syntax*, 437–492. Malden, MA: Blackwell Pub.

Fanselow, Gisbert & Damir Cavar. 2001. Remarks on the economy of pronunciation. In Gereon Müller & Wolfgang Sternefeld (eds.), *The rise of competition in syntax*: *A synopsis*, 107–150. Berlin: De Gruyter.

Fanselow, Gisbert & Sascha Felix. 1987. *Sprachtheorie*: *Band 2. Die Rektions- und Bindungstheorie*, 3rd edn. Tübingen, Basel: Francke.

Fanselow, Gisbert, Reinhold Kliegl & Matthias Schlesewsky. 2005. Syntactic variation in German wh-questions: Empirical investigations of weak crossover violations and long wh-movement. *Linguistic Variation Yearbook* 5. 37–63.

Fanselow, Gisbert & Anoop Mahajan. 2000. Towards a Minimalist Theory of Wh-Expletives, Wh-Copying, and Successive Cyclicity. In Uli Lutz, Gereon Müller & Arnim v. Stechow (eds.), *Wh-scope marking*, 195–230. Amsterdam: Benjamins.

Faucher, Eugène (ed.) (1982). *La linguistique à la session 1982 de l'agrégation d'allemand 1. Les constructions reflexives, 2. l'apposition*. Nancy.

Featherston, Sam. 2007. Data in generative grammar: The stick and the carrot. *Theoretical Linguistics* 33(3). 269–318.

Feldbusch, Elisabeth, Reiner Pogarell & Cornelia Weiß (eds.) (1991). *Neue Fragen der Linguistik*: *Bestand und Entwicklung*. Tübingen: Niemeyer.

Felser, Claudia. 2001. Wh-Expletives and Secondary Predication: German Partial Wh-Movement Reconsidered. *Journal of Germanic Linguistics* 13(1). 5–38.

Felser, Claudia. 2004. Wh-copying, phases, and successive cyclicity. *Lingua* 114(5). 543–574.

Fillmore, Charles J. 1968. The Case for Case. In Emmon Bach & Robert T. Harms (eds.), *Universals in linguistic theory*, 1–88. New York: Holt, Rinehart and Winston.

Foley, William A. 1986. *The Papuan languages of New Guinea*. Cambridge: CUP.

Fox, Samuel E. & Gerald Gazdar (eds.) (1977). *CLS Book of Squibs*. Chicago: Chicago Linguistic Society.

Friedman, Victor A. 1991. Case in Romani: Old Grammar in New Affixes. *Journal of Gypsy Lore Society* 1(2). 85–102.

Fuss, Eric. 2005. *The rise of agreement*: *A formal approach to the syntax and grammaticalization of verbal inflection*. Amsterdam: Benjamins.

Gärtner, Hans-Martin. 2002. *Generalized transformations and beyond*: *Reflections on minimalist syntax*. Berlin: Akademie Verlag.

Gazdar, Gerald, Ewan Klein, Geoffrey Pullum & Ivan Sag. 1985. *Generalized phrase structure grammar*. Cambridge, Mass.: Harvard University Press.

Geest, Wim d. (ed.) (1984). *Sentential complementation*. Dordrecht: Foris.

Gelderen, Elly v. 2011. *The linguistic cycle*: *Language change and the language faculty*. Oxford: OUP.

Georg, Stefan & A. P. Volodin. 1999. *Die itelmenische Sprache*: *Grammatik und Texte*. Wiesbaden: Harrassowitz.

Georgopoulos, Carol P. 1985. Variables in Palauan Syntax. *Natural Language and Linguistic Theory* 3(1). 59–94.

Georgopoulos, Carol P. 1991. *Syntactic variables*: *Resumptive pronouns and A'-binding in Palauan*. Dordrecht, Boston: Kluwer Academic Publishers.

Gerdts, Donna B. & Cheong Youn. 1988. Korean Psych Constructions: Advancement or Retreat? *Proceedings of CLS* 24. 155–175.

Geyer, Klaus. 2007. *Two systems of anaphorically used pronouns in plain text and in reported speech*: *DER/DIE and its counterparts in spoken German* (29. DGfS-Jahrestagung). Siegen (Deutschland).

Gippert, Jost. 1987. Zu den sekundären Kasusaffixen des Tocharischen. *Tocharian and Indo-European studies* 1. 22–39.

Giusti, Giuliana. 1986. On the lack of WH-infinitives with 'zu' and the projection of Comp in German. *Groninger Arbeiten zur germanistischen Linguistik* 28. 115–169.

Givón, Talmy. 1976. Topic, Pronoun and Grammatical Agreement. In Charles N. Li (ed.), *Subject and topic*, 149–188. New York: Academic Press.

Glinert, Lewis. 2005. *Modern Hebrew*: *An essential grammar*, 3rd edn. New York: Routledge.

Goodwin, William W. 1895. *A Greek Grammar*. London: Macmillian and Co.

Grewendorf, Günther. 1988. *Aspekte der deutschen Syntax*: *Eine Rektions-Bindungs-Analyse*. Tübingen: Günter Narr.

Grewendorf, Günther. 1989. Verbbewegung und Negation im Deutschen. *Groninger Arbeiten zur germanistischen Linguistik* 30. 57–125.

Grewendorf, Günther. 1995. Syntactic Sketches: German. In Joachim Jacobs, Arnim v. Stechow, Wolfgang Sternefeld & Theo Venneman (eds.), *Syntax*: *2. Halbband*, 1288–1319. Berlin: De Gruyter.

Grewendorf, Günther. 2002. *Minimalistische Syntax*. Tübingen: Francke.

Grewendorf, Günther. 2009. The Left Clausal Periphery: Clitic Left Dislocation in Italian and Left Dislocation in German. In Benjamin Shaer, Philippa Cook, Werner Frey & Claudia Maienborn (eds.), *Dislocated elements in discourse*: *Syntactic, semantic, and pragmatic perspectives*, 49–94. New York: Routledge.

Grimshaw, Jane B. 2000. Locality and extended projection. In Peter Coopmans, Martin Everaert & Jane B. Grimshaw (eds.), *Lexical specification and insertion*, 115–133. Amsterdam: Benjamins.

Groos, Anneke & Henk C. v. Riemsdijk. 1981. Matching Effects in Free Relatives: A Parameter of Core Grammar. In Adriana Belletti, Luciana Brandi & Luigi Rizzi (eds.), *Theory of markedness in generative grammar*: *Proceedings of the 1979 Glow Conference*, 171–216. Pisa: Scuola Normale Superiore di Pisa.

Groot, Casper d. 2000. Minor word classes. In Geert Booij, Christian Lehmann & Joachim Mugdan (eds.), *Morphologie*: *Morphology : ein internationales Handbuch zur Flexion und Wortbildung : an international handbook on inflection and word-formation*, 820–831. Berlin: De Gruyter.

Groote, Philippe de, Glyn V. Morrill & Christian Retoré (eds.) (2001). *Logical aspects of computational linguistics*: *4th international conference, LACL 2001, Le Croisic, France, June 27-29 2001 : proceedings*. Berlin, New York: Springer.

Haider, Hubert. 1985. Von Sein oder nicht Sein: Zur Grammatik des Pronomens "Sich". In Werner Abraham (ed.), *Erklärende Syntax des Deutschen*, 223–254. Tübingen: Günter Narr.

Haider, Hubert. 1988. Die Struktur der deutschen Nominalphrase. *Zeitschrift für Sprachwissenschaft* 7(1). 32–59.

Haider, Hubert. 1993. ECP-Etüden: Anmerkungen zur Extraktion aus eingebetteten V-2-Sätzen. *Linguistische Berichte* 145. 185–203.

Haider, Hubert. 2007. As a matter of facts - comments on Featherston's sticks and carrots. *Theoretical Linguistics* 33(3). 381–394.

Haider, Hubert. 2010. *The syntax of German*. Cambridge: CUP.

Hale, Kenneth, Samuel J. Keyser & Sylvain Bromberger (eds.) (1993). *The View from building 20*: *Essays in linguistics in honor of Sylvain Bromberger*. Cambridge, Mass.: MIT Press.

Halle, Morris & Alec Marantz. 1993. Distributed Morphology and the Pieces of Inflection. In Kenneth Hale, Samuel J. Keyser & Sylvain Bromberger (eds.), *The View from building 20*: *Essays in linguistics in honor of Sylvain Bromberger*, 111–176. Cambridge, Mass.: MIT Press.

Halwachs, Dieter, Gerd Ambrosch, Katharina Deman & Ursula Glaeser. 2002. *Burgenland-Romani*. Muenchen: LINCOM Europa.

Hamel, Patricia J. 1994. *A grammar and lexicon of Loniu, Papua New Guinea*. Canberra, Australia: Dept. of Linguistics, Research School of Pacific and Asian Studies, Australian National University.

Hanneforth, Thomas, Gisbert Fanselow & Peter Staudacher (eds.) (2010). *Language and logos*: *Studies in theoretical and computational linguistics*. Berlin: Akademie Verlag.

Harley, Heidi & Rolf Noyer. 2003. Distributed Morphology. In Lisa L. S. Cheng & R. P. E. Sybesma (eds.), *The second Glot international state-of-the-article book*: *The latest in linguistics*, 463–496. Berlin: De Gruyter.

Haruna, Andrew. 2003. *A grammatical outline of Gùrdùn/Gùrùntùm (Southern Bauchi, Nigeria)*. Köln: Rüdiger Köppe.

Haspelmath, Martin. 1993. *A grammar of Lezgian*. Berlin: De Gruyter.

Haspelmath, Martin & Hans-Jörg Bibiko. 2005. *The world atlas of language structures*. Oxford: OUP.

Heidolph, Karl, Walter Flämig & Wolfgang Motsch. 1981. *Grundzüge einer deutschen Grammatik*. Berlin: Akademie Verlag.

Hendrick, Randall (ed.) (1990). *The syntax of the modern Celtic languages*. San Diego, London: Academic Press.

Hewitt, B. G. 1979. *Abkhaz*. Amsterdam: North-Holland.

Hiemstra, Inge. 1986a. *Some Aspects of WH-movement in Frisian*. Groningen: Rijksuniversiteit Groningen M.A. Thesis.

Hiemstra, Inge. 1986b. Some aspects of wh-questions in Frisian. *NOWELE* 8. 97–110.

Hinterwimmer, Stefan. to appear. A Unified Account of the Properties of German Demonstrative Pronouns. *Proceedings of NELS*.

Hjelmslev, Louis. 1963. *Prolegomena to a Theory of Language*. Translated by Francis J. Whitfield. Madison: The University of Wisconsin Press.

Hjelmslev, Louis. 1972. *La catégorie des cas*: *Étude de grammaire générale*. 2 Teile in einem Bd. München: Fink.

Höhle, Tilman. 2000. The W… W-Construction: Appositive or Scope Indicating? In Uli Lutz, Gereon Müller & Arnim v. Stechow (eds.), *Wh-scope marking*, 249–270. Amsterdam: Benjamins.

Holst, Jan H. 2001. *Lettische Grammatik*. Hamburg: Buske.

Horvath, Julia. 2000. On the Syntax of "Wh-Scope Marker" Constructions: Some Comparative Evidence. In Uli Lutz, Gereon Müller & Arnim v. Stechow (eds.), *Wh-scope marking*, 271–316. Amsterdam: Benjamins.

Huddleston, Rodney & Geoffrey K. Pullum. 2002. *The Cambridge grammar of the English language*. Cambridge: CUP.

Hutchison, John P. & Victor Manfredi (eds.) (1990). *Current Approaches to African Linguistics*: *Volume 7*. Dordrecht: Foris.

Jackendoff, Ray S. 1973. The Base Rules for Prepositional Phrases. In Stephen R. Anderson & Paul Kiparsky (eds.), *A Festschrift for Morris Halle*, 345–356. New York: Holt, Rinehart and Winston.

Jackendoff, Ray S. 1992. Mme. Tussaud Meets the Binding Theory. *Natural Language and Linguistic Theory* 10(1). 1–31.

Jacobs, Joachim, Arnim v. Stechow, Wolfgang Sternefeld & Theo Venneman (eds.) (1995). *Syntax*: *2. Halbband*. Berlin: De Gruyter.

Jacobson, Pauline I. 1984. Connectivity in phrase structure grammar. *Natural Language and Linguistic Theory* 1(4). 535–581.

Jacobson, Pauline I. & Geoffrey K. Pullum (eds.) (1982). *The Nature of syntactic representation*. Dordrecht, Holland, Boston, U.S.A, Hingham, MA: D. Reidel Pub. Co.

Janas, Petr. 1984. *Niedersorbische Grammatik für den Schulgebrauch*, 2nd edn. Bautzen: Domowina-Verl.

Jaspers, Dany (ed.) (to appear). *Case at the Interfaces*.

Jespersen, Otto. 1927. *A Modern English Grammar on Historical Principles*: *Part 3. Syntax: Second Volume*. Heidelberg: Carl Winter.

Jespersen, Otto. 1933. *Essentials of English grammar*. London: George Allan & Unwin.

Johnson, David E. & Lawrence S. Moss. 1995. Stratified Feature Structures for Multistratal Relational Analyses. In Jennifer Cole, Georgia M. Green & Jerry L. Morgan (eds.), *Linguistics and computation*, 29–84. Stanford: CSLI.

Johnson, David E. & Paul M. Postal. 1980. *Arc pair grammar*. Princeton, N.J: Princeton University Press.

Joseph, Brian D. 1976. Raising in Modern Greek: A Copying Process? *Harvard Studies in Syntax and Semantics* 2. 241–278.

Joseph, Brian D. 1980. Recovery of information in Relative Clauses: Evidence from Greek and Hebrew. *Journal of Linguistics* 16(2). 237–244.

Kampen, Jacqueline v. 1997. *First steps in Wh-movement*. Delft: Eburon.

Karg, Fritz. 1923. Das Relativum in der Heliandhandschrift C. *Indogermanische Forschungen* 41. 1–12.

Katz, Jerrold J. & Paul M. Postal. 1964. *An integrated theory of linguistic descriptions*. Cambridge, Mass: MIT Press.

Kavitskaya, Darya. 2010. *Crimean Tatar*. München: LINCOM Europa.

Kayne, Richard S. 1994. *The antisymmetry of syntax*. Cambridge, Mass: MIT Press.

Kayne, Richard & Jean-Yves Pollock. 1978. Stylistic Inversion, Successive Cyclicity, and Move NP in French. *Linguistic Inquiry* 9(4). 595–621.

Kettmann, Gerhard. 1971. *Frühneuhochdeutsche Texte*. Leipzig: VEB Bibliographisches Institut.

King, Gareth. 1993. *Modern Welsh*: *A comprehensive grammar*. London, New York: Routledge.

Kohrt, Manfred & Jürgen Lenerz (eds.) (1981). *Sprache, Formen und Strukturen*: *Akten des 15. Linguistischen Kolloquiums, Münster 1980. Band 1*. Tübingen: Niemeyer.

König, Christa. 2008. Marked Nominatives. In Andrej Malchukov & Andrew Spencer (eds.), *The Oxford Handbook of Case*, 535–548. Oxford: OUP.

Koopman, Hilda. 1983. Control from COMP and Comparative Syntax. *The Linguistic Review* 2(4). 365–391.

Koopman, Hilda & Dominique Sportiche. 1986. A Note on Long Extraction in Vata and the ECP. *Natural Language and Linguistic Theory* 4(3). 357–374.

Kornfilt, Jaklin. 1997. *Turkish*. London: Routledge.

Koster, Jan. 2009. *IM not perfect*: *The case against copying*. Rijksuniversiteit Groningen.

Kubiński, Wojciech. 1987. *Reflexivization in English and Polish*: *An arc pair grammar analysis*. Tübingen: Niemeyer.

Kuroda, Sige-Yuki. 2005. On dative subjects in Russian. In Hans Broekhuis, Norbert Corver, Riny Huybregts, Ursula Kleinhenz & Jan Koster (eds.), *Organizing grammar*: *Studies in honor of Henk van Riemsdijk*, 365–373. Berlin: De Gruyter.

Lalitha Devi, Sobha, António Branco & Ruslan Mitkov (eds.) (2009). *Anaphora processing and applications*. Berlin, New York: Springer.

Lamontagne, Greg & Lisa d. Travis. 1986. The Case Filter and the ECP. *McGill Working Papers in Linguistics* 3(2). 51–75.

Lapointe, Steven G. 1993. Review of "Studies in Relational Grammar 3". *Language* 69(2). 345–353.

Larson, Meredith. 2006. The Thais that bind: Principle C and Bound Expressions in Thai. *Proceedings of NELS* 36. 427–440.

Lasnik, Howard (ed.) (1989a). *Essays on anaphora*. Dordrecht, Boston: Kluwer Academic Publishers.

Lasnik, Howard. 1989b. On the Necessity of Binding Conditions. In Howard Lasnik (ed.), *Essays on anaphora*, 149–167. Dordrecht, Boston: Kluwer Academic Publishers.

Lasnik, Howard & Robert Fiengo. 1974. Complement Object Deletion. *Linguistic Inquiry* 5(4). 535–571.

Lasnik, Howard, Roger Martin, David Michaels & Juan Uriagereka (eds.) (2000). *Step by step*: *Essays on minimalist syntax in honor of Howard Lasnik*. Cambridge, Mass: MIT Press.

Lee, Felicia. 2003. Anaphoric R-Expressions as Bound Variables. *Syntax* 6(1). 84–114.

Lehmann, Thomas. *Sanskrit für Anfänger*: *Ein Lehr- und Übungsbuch* (Teil 1:Grammatik).

Leu, Thomas. 2008. The Internal Syntax of Determiners. *Groninger Arbeiten zur germanistischen Linguistik* 47.

Lewin, Bruno. 1975. *Abriss der japanischen Grammatik auf der Grundlage der klassischen Schriftsprache*, 2nd edn. Wiesbaden: Harrassowitz.

Lewis, William, Simin Karimi, Heidi Harley & Scott O. Farrar (eds.) (2009). *Time and again*: *Theoretical perspectives on formal linguistics : in honor of D. Terence Langendoen*. Amsterdam: Benjamins.

Li, Charles N. (ed.) (1976). *Subject and topic*. New York: Academic Press.

Lohndal, Terje. 2010. Medial-wh Phenomena, Parallel Movement, and Parameters. *Linguistic Analysis* 34(3-4). 215–244.

Lühr, Rosemarie. 1988. Satzverschränkung im heutigen Deutsch. *Groninger Arbeiten zur germanistischen Linguistik* 29. 73–87.

Lutz, Uli, Gereon Müller & Arnim v. Stechow (eds.) (2000). *Wh-scope marking*. Amsterdam: Benjamins.

Lutz, Uli & Jürgen Pafel (eds.) (1995). *On extraction and extraposition in German*. Amsterdam: Benjamins.

Malchukov, Andrej & Andrew Spencer (eds.) (2008). *The Oxford Handbook of Case*. Oxford: OUP.

Maling, Joan. 1977. On Nonrecoverable Deletion. In Samuel E. Fox & Gerald Gazdar (eds.), *CLS Book of Squibs*, 66–67. Chicago: Chicago Linguistic Society.

Maling, Joan & Annie Zaenen (eds.) (1990). *Modern Icelandic Syntax*. San Diego.: Academic Press.

Maslova, Elena. 2003a. *A grammar of Kolyma Yukaghir*. Berlin: De Gruyter.

Maslova, Elena. 2003b. *Tundra Yukaghir*. München: LINCOM Europa.

Matras, Yaron. 2002. *Romani*: *A linguistic introduction*. Cambridge: CUP.

McCawley, James D. 1968. Concerning the Base Component of a Transformational Grammar. *Foundations of Language* 4(3). 243–269.

McCawley, James D. (ed.) (1973a). *Grammar and Meaning*: *Papers on syntactic and semantic topics*. Tokyo: Taishukan Publishing Company.

McCawley, James D. 1973b. The Role of Semantics in a Grammar. In James D. McCawley (ed.), *Grammar and Meaning*: *Papers on syntactic and semantic topics*, 59–98. Tokyo: Taishukan Publishing Company.

McCawley, James D. 1982. Parentheticals and Discontinuous Constituent Structure. *Linguistic Inquiry* 13(1). 91–106.

McCawley, James D. 1998. *The syntactic phenomena of English*, 2nd edn. Chicago: University of Chicago Press.

McCloskey, James. 1979. *Transformational syntax and model theoretic semantics*: *A case study in modern Irish* (Synthese language library 9). Dordrecht, Holland, Boston: D. Reidel Pub. Co.

McCloskey, James. 1990. Resumptive Pronouns, A'-Binding, and Levels of Representation in Irish. In Randall Hendrick (ed.), *The syntax of the modern Celtic languages*, 199–256. San Diego, London: Academic Press.

McCloskey, James. 2002. Resumption, Successive Cyclicity, and the Locality of Operations. In Samuel D. Epstein & T. D. Seely (eds.), *Derivation and explanation in the Minimalist Program*, 184–226. Malden, MA: Blackwell Pub.

McCloskey, James. 2006. Resumption. In Martin Everaert & Henk C. v. Riemsdijk (eds.), *The Blackwell companion to syntax*, 94–117. Malden, MA: Blackwell Pub.

McDaniel, Dana. 1986. *Conditions on wh-chains.* New York: City University of New York PhD Thesis.

McDaniel, Dana. 1989. Partial and multiple Wh-movement. *Natural Language and Linguistic Theory* 7(4). 565–604.

Megerdoomian, Karine & Shadi Ganjavi. 2000. Against Optional Wh-Movement. *Proceedings of WECOL* 12. 358–369.

Meillet, Antoine. 1913. *Altarmenisches Elementarbuch.* Heidelberg: Carl Winter.

Meinunger, André. 2007. About Object es in the German Vorfeld. *Linguistic Inquiry* 38(3). 553–563.

Mel'čuk, Igor A. 1988. *Dependency syntax*: *Theory and practice.* New York: State University of New York Press.

Mel'čuk, Igor A. & David Beck. 2006. *Aspects of the theory of morphology.* Berlin: De Gruyter.

Merchant, Jason. 2004. Resumptivity and non-movement. *Studies in Greek Linguistics* 24. 471–481.

Moore, John. 1990. Spanish Clause Reduction with Downstairs Cliticization. In Katarzyna Dziwirek, Patrick Farrell & Errapel Mejías-Bikandi (eds.), *Grammatical relations*: *A cross-theoretical perspective*, 319–333. Stanford: CSLI.

Moore, John. 1998. Turkish Copy-Raising and A-Chain Locality. *Natural Language and Linguistic Theory* 16(1). 149–189.

Moore, John & David M. Perlmutter. 2000. What Does It Take To Be A Dative Subject. *Natural Language and Linguistic Theory* 18(2). 373–416.

Mortensen, David R. 2004. *Two Types of Variable Elements in Hmong Anaphora.* University of California, Berkeley.

Müller, Gereon. 1997. Partial wh-movement and Optimality Theory. *The Linguistic Review* 14(3). 249–306.

Müller, Gereon. 2000. Das Pronominaladverb als Reparaturphänomen. *Linguistische Berichte* 182. 139–178.

Müller, Gereon. 2009. *Optimality-Theoretic Syntax* (Comparing Frameworks). Utrecht.

Müller, Gereon & Wolfgang Sternefeld (eds.) (2001). *The rise of competition in syntax*: *A synopsis.* Berlin: De Gruyter.

Müller, Stefan. 1999. An HPSG-Analysis for Free Relative Clauses in German. *Grammars* 2(1). 53–105.

Munaro, Nicola, Cecilia Poletto & Jean-Yves Pollock. 2001. Eppur si muove!: On comparing French and Bellunese wh-movement. *Linguistic Variation Yearbook* 1. 147–180.

Newman, Paul & Robert D. Botne (eds.) (1989). *Current Approaches to African Linguistics*: *Volume 5.* Dordrecht: Foris.

Noonan, Máire B. 2002. CP-pied-piping and remnant IP movement in long distance wh-movement. In Artemis Alexiadou (ed.), *Dimensions of movement*: *From features to remnants*, 296. Amsterdam: Benjamins.

Nunes, Jairo. 2001. Sideward Movement. *Linguistic Inquiry* 32(2). 303–344.

Nunes, Jairo. 2004. *Linearization of chains and sideward movement.* Cambridge, Mass: MIT Press.

Pafel, Jürgen. 2000. Absolute and Relative: On Scope in German Wh-Sentences, W-…W-Constructions Included. In Uli Lutz, Gereon Müller & Arnim v. Stechow (eds.), *Wh-scope marking*, 333–358. Amsterdam: Benjamins.

Pankau, Andreas. 2007. *Die wh-Kopie-Konstruktion im Deutschen:* University of Potsdam Diplomarbeit (MA Thesis).

Pankau, Andreas. 2009. Copies at the Interfaces. *Proceedings of the Patras International Conference of Graduate Students in Linguistics* 1. 197–209.

Pankau, Andreas, Craig Thiersch & Kay-Michael Würzner. 2010. Spurious Ambiguities and the Parentheticals Debate. In Thomas Hanneforth, Gisbert Fanselow & Peter Staudacher (eds.), *Language and logos*: *Studies in theoretical and computational linguistics*, 129–146. Berlin: Akademie Verlag.

Parker, Steve. 1999. On the Behavior of Definite Articles in Chamicuro. *Language* 75(3). 552–562.

Partee, Barbara, Alice G. B. t. Meulen & Robert E. Wall. 1993. *Mathematical methods in linguistics*, 2nd edn. Dordrecht: Kluwer.

Paul, Hermann. 1916. *Deutsche Grammatik I*: *Teil 1: Geschichtliche Einleitung, Teil 2: Lautlehre*. Halle a.S: Niemeyer.

Paul, Hermann. 1920. *Deutsche Grammatik IV*: *Teil 4: Syntax (Hälfte 2)*. Halle a.S: Niemeyer.

Paul, Hermann & Walther Mitzka. 1966. *Mittelhochdeutsche Grammatik*, 19th edn. Tübingen: Niemeyer.

Paul, Hermann, Peter Wiehl & Siegfried Grosse. 1989. *Mittelhochdeutsche Grammatik*, 23rd edn. Tübingen: Niemeyer.

Pedersen, Holger. 1913. *Vergleichende Grammatik der Keltischen Sprachen*: *Band 2: Bedeutungslehre (Wortlehre)*. Göttingen: Vandenhoeck Ruprecht.

Peranteau, Paul, Judith N. Levi & Gloria C. Phares (eds.) (1972). *The Chicago which hunt*: *Papers from the Relative Clause Festival ; April 13, 1972 ; a paravolume to the papers from the Eighth Regional Meeting*. Chicago: Chicago Linguistic Society.

Perlmutter, David M. 1972. Evidence for Shadow Pronouns in French Relativization. In Paul Peranteau, Judith N. Levi & Gloria C. Phares (eds.), *The Chicago which hunt*: *Papers from the Relative Clause Festival ; April 13, 1972 ; a paravolume to the papers from the Eighth Regional Meeting*, 73–105. Chicago: Chicago Linguistic Society.

Perlmutter, David M. 1978. Impersonal Passives and the Unaccusative Hypothesis. *Proceedings of BLS* 4. 157–190.

Perlmutter, David M. (ed.) (1983). *Studies in relational grammar 1*. Chicago: University of Chicago Press.

Perlmutter, David M. & John Moore. 2002. Language-Internal Explanation: The Distribution of Russian Impersonals. *Language* 78(4). 619–650.

Perlmutter, David M. & Paul M. Postal. 1983. Some Proposed Laws of Basic Clause Structure. In David M. Perlmutter (ed.), *Studies in relational grammar 1*, 81–129. Chicago: University of Chicago Press.

Perlmutter, David M. & Carol G. Rosen (eds.) (1984). *Studies in relational grammar 2*. Chicago: University of Chicago Press.

Perlmutter, David M. & Scott Soames. 1979. *Syntactic argumentation and the structure of English* (Campus 231). Berkeley: University of California Press.

Perlmutter, David M. & Annie Zaenen. 1984. The Indefinite Extraposition Construction in Dutch and German. In David M. Perlmutter & Carol G. Rosen (eds.), *Studies in relational grammar 2*, 171–216. Chicago: University of Chicago Press.

Picallo, M. C. 1991. Nominals and Nominalization in Catalan. *Probus* 3(3). 279–316.

Pinnow, Heinz-Jürgen. 1965. Personal Pronouns in the Austroasiatic Languages: A Historical Study. *Lingua* 14. 3–42.

Pittner, Karin. 1991. Freie Relativsätze und die Kasushierarchie. In Elisabeth Feldbusch, Reiner Pogarell & Cornelia Weiß (eds.), *Neue Fragen der Linguistik*: *Bestand und Entwicklung*, 341–347. Tübingen: Niemeyer.

Plank, Frans (ed.) (1995). *Double case*: *Agreement by suffixaufnahme*. Oxford: OUP.

Plann, Susan. 1986. On Case-Marking Clauses in Spanish: Evidence against the Case Resistance Principle. *Linguistic Inquiry* 17(2). 336–345.

Plessis, Hans du. 1977. Wh Movement in Afrikaans. *Linguistic Inquiry* 8(4). 723–726.

Poletto, Cecilia. 2000. *The higher functional field*: *Evidence from northern Italian dialects* (Oxford studies in comparative syntax). New York: Oxford University Press.

Poletto, Cecilia & Jean-Yves Pollock. 2000. On the Left Periphery of Some Romance Wh-Questions. *University of Venice Working Papers in Linguistics* 10(2). 115–182.

Pollard, Carl J. & Ivan A. Sag. 1994. *Head-driven phrase structure grammar*. Stanford, Chicago: CSLI; University of Chicago Press.

Poppe, Nikolaj N. 1963. *Tatar Manual*: *Descriptive Grammar and Texts with a Tatar-English Glossary*. Bloomington: Indiana University Publications.

Postal, Paul M. Chomsky's Foundational Admission. ling.auf.net/lingbuzz/001569.

Postal, Paul M. 1969. On So-Called "Pronouns" in English. In David A. Reibel & Sanford A. Schane (eds.), *Modern studies in English*: *Readings in transformational grammar*, 201–224. Englewood Cliffs, N.J: Prentice-Hall.

Postal, Paul M. 1970. On Coreferential Complement Subject Deletion. *Linguistic Inquiry* 1(4). 439–500.

Postal, Paul M. 1972. 'Pronominal Epithets' and Similar Items. *Foundations of Language* 9(2). 246–248.

Postal, Paul M. 1982. Some Arc Pair Grammar Descriptions. In Pauline I. Jacobson & Geoffrey K. Pullum (eds.), *The Nature of syntactic representation*, 341–425. Dordrecht, Holland, Boston, U.S.A, Hingham, MA: D. Reidel Pub. Co.

Postal, Paul M. 1986. *Studies of passive clauses*. Albany: State University of New York Press.

Postal, Paul M. 1990. French Indirect Object Demotion. In Paul M. Postal & Brian D. Joseph (eds.), *Studies in relational grammar 3*, 104–200. Chicago: University of Chicago Press.

Postal, Paul M. 1992. Phantom Successors and the French FAIRE PAR Construction. In Diane Brentari, Gary N. Larson & Lynn A. MacLeod (eds.), *The Joy of grammar*: *A Festschrift in honor of James D. McCawley*, 289–321. Amsterdam: Benjamins.

Postal, Paul M. 1994a. Contrasting extraction types. *Journal of Linguistics* 30(1). 159–186.

Postal, Paul M. 1994b. The Ungrammaticality of Subnominal EN in French Object-Raising Complements. *Linguistic Inquiry* 25(1). 179–186.

Postal, Paul M. 1998. *Three investigations of extraction* . Cambridge, Mass: MIT Press.

Postal, Paul M. 2004. *Skeptical linguistic essays*. Oxford: OUP.

Postal, Paul M. 2007. *Edge-Based Model-Theoretic Syntax*. New York University.

Postal, Paul M. 2010. *Edge-based clausal syntax*: *A study of (mostly) English object structure*. Cambridge, Mass: MIT Press.

Postal, Paul M. & Brian D. Joseph (eds.) (1990). *Studies in relational grammar 3*. Chicago: University of Chicago Press.

Postal, Paul M. & John R. Ross. 2009. Inverse reflexives. In William Lewis, Simin Karimi, Heidi Harley & Scott O. Farrar (eds.), *Time and again*: *Theoretical perspectives on formal linguistics : in honor of D. Terence Langendoen*, 3–36. Amsterdam: Benjamins.

Pullum, Geoffrey K. & Barbara C. Scholz. 2001. On the Distinction between Model-Theoretic and Generative-Enumerative Syntactic Frameworks. In Philippe de Groote, Glyn V. Morrill & Christian Retoré (eds.), *Logical aspects of computational linguistics*: *4th international conference, LACL 2001, Le Croisic, France, June 27-29 2001 : proceedings*, 17–43. Berlin, New York: Springer.

Rauh, Gisa. 2010. *Syntactic categories*: *Their identification and description in linguistic theories*. Oxford: OUP.

Reibel, David A. & Sanford A. Schane (eds.) (1969). *Modern studies in English*: *Readings in transformational grammar*. Englewood Cliffs, N.J: Prentice-Hall.

Reis, Marga. 1982. Reflexivierung im Deutschen. In Eugène Faucher (ed.), *La linguistique à la session 1982 de l'agrégation d'allemand 1. Les constructions reflexives, 2. l'apposition*, 1–40. Nancy.

Reis, Marga. 1995. Extractions from Verb-Second Clauses in German? In Uli Lutz & Jürgen Pafel (eds.), *On extraction and extraposition in German*, 45–88. Amsterdam: Benjamins.

Reis, Marga. 2000. On the Parenthetical Features of German Was…W Constructions and How to Account for Them. In Uli Lutz, Gereon Müller & Arnim v. Stechow (eds.), *Wh-scope marking*, 359–407. Amsterdam: Benjamins.

Rett, Jessica. 2006. Pronominal vs. determiner wh-words: Evidence from the copy construction. *Empirical Issues in Syntaxc and Semantics 6* 6. 355–374.

Reuland, Eric. 2011. *Anaphora and language design*. Cambridge, Mass: MIT Press.

Reuland, Eric & Alice G. B. t. Meulen (eds.) (1987). *The Representation of (in)definiteness*. Cambridge, Mass: MIT Press.

Reuland, Eric & Yoad Winter. 2009. Binding without Identity: Towards a Unified Semantics for Bound and Exempt Anaphors. In Sobha Lalitha Devi, António Branco & Ruslan Mitkov (eds.), *Anaphora processing and applications*, 69–79. Berlin, New York: Springer.

Rhodes, Richard A. 1990. Ojibwa Secondary Objects. In Katarzyna Dziwirek, Patrick Farrell & Errapel Mejías-Bikandi (eds.), *Grammatical relations*: *A cross-theoretical perspective*, 401–414. Stanford: CSLI.

Richards, Norvin. 2010. *Uttering trees*. Cambridge, Mass: MIT Press.

Richards, Norvin. 2013. Lardil "Case Stacking" and the Timing of Case Assignment. *Syntax* 16(1). 42–76.

Riemsdijk, Henk C. v. 1978. *A case study in syntactic markedness*: *The binding nature of prepositional phrases*. Lisse: Peter de Ridder Press.

Rijk, Rudolf P. G. d. 2008. *Standard Basque*: *A progressive grammar*. Cambridge, Mass.: MIT Press.

Ritter, Elizabeth. 1991. Functional categories in noun phrases: Evidence from Modern Hebrew. In Susan D. Rothstein (ed.), *Perspectives on Phrase Structure*: *Heads and licensing*, 37–62. San Diego: Academic Press.

Robins, Robert H. 1969. *A short history of linguistics*, 2nd edn. London: Longmans.

Ross, John R. 1986. *Infinite syntax*. Norwood, N.J: ABLEX.

Rothstein, Susan D. (ed.) (1991). *Perspectives on Phrase Structure*: *Heads and licensing*. San Diego: Academic Press.

Rounds, Carol. 2001. *Hungarian*: *An essential grammar*. London, New York: Routledge.

Rouveret, Alain (ed.) (2011). *Resumptive pronouns at the interfaces*. Amsterdam: Benjamins.

Ruwet, Nicolas. 1991. *Syntax and human experience*. Chicago: University of Chicago Press.

Ryding, Karin C. 2005. *A reference grammar of modern standard Arabic*. Cambridge: CUP.

Sabel, Joachim. 1996. *Restrukturierung und Lokalität*: *Universelle Beschränkungen für Wortstellungsvarianten*. Berlin: Akademie Verlag.

Sabel, Joachim. 2000. Expletives as Features. *Proceedings of WCCFL* 19. 411–424.

Sabel, Joachim. 2002. Die Doppelobjekt-Konstruktion im Deutschen. *Linguistische Berichte* 190. 229–244.

Saddy, James D. 1991. *Investigations into grammatical knowledge.* Cambridge, Mass: MIT PhD Thesis.

Salzmann, Martin. 2006. *Resumptive prolepsis*: *A study in indirect A'-dependencies*. Utrecht: LOT.

Sampson, Geoffrey. 1975. The single mother condition. *Journal of Linguistics* 11(1). 1–11.

Schmitt, Pierre. 1984. *Untersuchungen zur luxemburgischen Syntax*. Marburg: N.G. Elwert.

Schütze, Carson T. 2001. On Korean "Case Stacking": The varied functions of the particles KA and LUL. *The Linguistic Review* 18(3). 193–232.

Seiter, William J. 1983. Subject-Direct Object Raising in Niuean. In David M. Perlmutter (ed.), *Studies in relational grammar 1*, 317–359. Chicago: University of Chicago Press.

Shaer, Benjamin, Philippa Cook, Werner Frey & Claudia Maienborn (eds.) (2009). *Dislocated elements in discourse*: *Syntactic, semantic, and pragmatic perspectives*. New York: Routledge.

Shibatani, Masayoshi. 1977. Grammatical Relations and Surface Cases. *Language* 53(4). 789–809.

Simpson, Andrew. 2000. *Wh-movement and the theory of feature-checking*. Amsterdam: Benjamins.

Smith, Carlota S. 1969. Determiners and Relative Clauses in a Generative Grammar of English. In David A. Reibel & Sanford A. Schane (eds.), *Modern studies in English*: *Readings in transformational grammar*, 247–263. Englewood Cliffs, N.J: Prentice-Hall.

Somfai Kara, Dávid. 2002. *Kazak*. Muenchen: LINCOM Europa.

Somfai Kara, Dávid. 2003. *Kyrgyz*. Muenchen: LINCOM Europa.

Sonaiya, Remi. 1989. Wh-Movement and Proper Government in Yoruba. In Paul Newman & Robert D. Botne (eds.), *Current Approaches to African Linguistics*: *Volume 5*, 109–125. Dordrecht: Foris.

Sportiche, Dominique. 2011. French Relative QUI. *Linguistic Inquiry* 42(1). 83–124.

Starke, Michal. 2009. Nanosyntax: A short primer to a new approach to language. *Nordlyd* 36(1). 1–6.

Stechow, Arnim v. 2000. Partial Wh-Movement, Scope Marking, and Transparent Logical Form. In Uli Lutz, Gereon Müller & Arnim v. Stechow (eds.), *Wh-scope marking*, 447–478. Amsterdam: Benjamins.

Steinbach, Markus. 2004. Unaccusatives and Anticausatives in German. In Artemis Alexiadou, Elena Anagnostopoulou & Martin Everaert (eds.), *The unaccusativity puzzle*: *Explorations of the syntax-lexicon interface*, 181–206. Oxford: OUP.

Stolz, Thomas. 1992. *Lokalkasussysteme*: *Aspekte einer strukturellen Dynamik*. Wilhelmsfeld: G. Egert.

Szabolcsi, Anna. 2006. Strong vs. Weak Islands. In Martin Everaert & Henk C. v. Riemsdijk (eds.), *The Blackwell companion to syntax*, 479–531. Malden, MA: Blackwell Pub.

Szczegielniak, Adam. 2004. *Relativization and Ellipsis*. Cambridge, Mass: Harvard University PhD Thesis.

Tappe, Hans T. 1981. Wer glaubst du hat Recht?: Einige Bemerkungen zur COMP-COMP-Bewegung im Deutschen. In Manfred Kohrt & Jürgen Lenerz (eds.), *Sprache, Formen und Strukturen*: *Akten des 15. Linguistischen Kolloquiums, Münster 1980. Band 1*, 203–212. Tübingen: Niemeyer.

Tappe, Hans T. 1984a. On infinitival clauses without COMP. In Wim d. Geest (ed.), *Sentential complementation*, 227–237. Dordrecht: Foris.

Tappe, Hans T. 1984b. Überlegungen zu Passiv und Kasustheorie im Deutschen. In Hartmut Czepluch & Hero Janssen (eds.), *Syntaktische Struktur und Kasusrelation*, 85–106. Tübingen: Günter Narr.

Tasmowski, Liliane. 28-42. … en semble … OU … semble en … *Le Français Moderne* 58(1-2).

Tesnière, Lucien. 1959. *Éléments de syntaxe structurale*. Paris: Klincksieck.

Thornton, Rosalind. 1990. *Adventures in Long-Distance Moving*: *The Acqusition of Complex Wh-Questions*. Storrs, Connecticut: University of Connecticut PhD Thesis.

Thráinsson, Höskuldur. 2007. *The syntax of Icelandic*. Cambridge: CUP.

Thurneysen, Rudolf. 1909. *Handbuch des Alt-Irischen*: *Band 1: Grammatik*. Heidelberg: Carl Winter.

Tomaszewicz, Barbara. 2011. Against Spurious Coordination in Multiple Wh-questions. *Proceedings of WCCFL* 28. 186–195.

Torrego, Esther. 1984. On Inversion in Spanish and Some of Its Effects. *Linguistic Inquiry* 15(1). 103–129.

Trembaly, Mireille K. O. 1990. The internal structure of PPs in Amharic: On postpositions and prepositional case affixes. In John P. Hutchison & Victor Manfredi (eds.), *Current Approaches to African Linguistics*: *Volume 7*, 167–178. Dordrecht: Foris.

Turano, Giuseppina. 1998. Overt and covert dependencies in Albanian. *Studia Linguistica* 52(2). 149–183.

Ura, Hiroyuki. 1998. Checking, Economy, and Copy-raising in Igbo. *Linguistic Analysis* 28(1-2). 67–88.

Urban, Greg. 1985. Ergativity and Accusativity in Shokleng (Gê). *International Journal of American Linguistics* 51(2). 164–187.

Vajda, Edward J. 2004. *Ket*. Muenchen: LINCOM Europa.

Vogel, Ralf. 2001. Case Conflict in German Free Relative Constructions: An Optimality Theoretic Treatment. In Gereon Müller & Wolfgang Sternefeld (eds.), *The rise of competition in syntax*: *A synopsis*, 341–375. Berlin: De Gruyter.

Vooys, C. G. N. d. 1949. *Nederlandse spraakkunst*, 2nd edn. Groningen: Wolters.

Wackernagel, Jacob. 1928. *Vorlesungen über Syntax*: *Mit besonderer Berücksichtigung von Griechisch, Lateinisch und Deutsch*, 2nd edn. Basel: Birkhäuser.

Weise, Oskar. 1916. Die Relativpronomina in den deutschen Mundarten. *Zeitschrift für Deutsche Mundarten* 12. 64–71.

Welmers, William E. 1976. *A grammar of Vai*. Berkeley: University of California Press.

Wiltschko, Martina. 1998. On the Syntax and Semantic of (Relative) Pronouns and Determiners. *Journal of Comparative and Germanic Linguistics* 2(2). 143–181.

Winkler, Eberhard. 2001. *Udmurt*. Muenchen: LINCOM Europa.

Yang, Henrietta. 2006. On Overt and Covert Wh- and Relative Movement in Hindi and Punjabi. In Lisa L. S. Cheng & Norbert Corver (eds.), *Wh-movement*: *Moving on*, 135–164. Cambridge, Mass: MIT Press.

Yoon, James H. 2004. Non-nominative (major) subjects and case stacking in Korean. In Peri Bhaskararao & Karumuri V. Subbarao (eds.), *Non-nominative subjects*: *Volume 2*, 265–314. Amsterdam: Benjamins.

Zaenen, Annie. 1983. On Syntactic Binding. *Linguistic Inquiry* 14(3). 469–504.

Zhang, Niina N. 2007. The syntactic derivations of two paired dependency constructions. *Lingua* 117(12). 2134–2158.

Zwicky, Arnold M. 1992. Jottings on Adpositions, Case Inflections, Government, and Agreement. In Diane Brentari, Gary N. Larson & Lynn A. MacLeod (eds.), *The Joy of grammar*: *A Festschrift in honor of James D. McCawley*, 369–383. Amsterdam: Benjamins.

Samenvatting in het Nederlands

Het onderwerp

In dit proefschrift heb ik de syntaxis van een eigenaardige langeafstandsextractie-constructie in het Duits onderzocht, die in de literatuur *vraagwoorddubbeling* wordt genoemd. De constructie wordt in (1) geïllustreerd:

(1)   a.   **Wen** glaubst du <u>wen</u> sie liebt?
            wie   geloof je   wie zij houdt
            Van wie geloof je dat zij houdt?
     b.   **Wen** glaubst du <u>wen </u>er meint <u>wen</u> sie liebt?
            wie   geloof je   wie hij meent wie zij houdt
            Van wie geloof je dat hij meent dat zij houdt?

De eigenaardigheid van deze constructie is dat het geëxtraheerde vraagwoordelement hervat wordt: niet alleen bevat de constructie een geëxtraheerd vraagwoordelement (het **dikgedrukte** element, in het vervolg het *geëxtraheerde element*), dat zelf in zijn canonieke positie in de hoofdzin verschijnt, ook is er een extra element (het <u>onderstreepte</u> element, in het vervolg het *hervattende element*), dat in de beginpositie van elke ingebedde zin verschijnt. Hoewel er aan deze constructie al veel onderzoek is gewijd, zijn er nog altijd descriptieve leemtes. In het bijzonder is er tot nu toe geen beschrijving van het hervattende element en zijn verband met het geëxtraheerde element die compatibel is met alle gerapporteerde data over het Duits. Dientengevolge is het onderwerp van dit proefschrift vraagwoorddubbeling in het algemeen, en het hervattende element en zijn verband met het geëxtraheerde element in het bijzonder.

De resultaten

Dit proefschrift leverde in totaal vier resultaten op. Ten eerste is vraagwoorddubbeling getypeerd op een manier die in de literatuur vooralsnog onopgemerkt is gebleven. Het hervattende element is een apart element en, meer specifiek, een voornaamwoord. Het is niet, zoals algemeen aangenomen, een kopie van de echte vraagwoordfrase (vgl. (2)).

(2)   **Welchen Mann** glaubst du <u>wen</u> sie liebt?
        welke   man   geloof je wie zij houdt
        Van welke man geloof jij dat zij houdt?

Ondanks deze onafhankelijkheid wordt het hervattende element niettemin onderworpen aan restricties die voorschrijven dat het element in een aantal kenmerken met de echte vraagwoordfrase moet overeenkomen. Kort samengevat is het eerste verkregen resultaat dat het hervattende element verschilt van de echte vraagwoordfrase en dat het geen herhaling is van deze frase.

Ten tweede beargumenteerde ik dat het Arc Pair Grammar-framework (in het vervolg APG) een empirisch succesvolle en theoretisch elegante analyse van vraagwoorddubbeling in het Duits mogelijk maakt. APG beschikt namelijk over twee speciale analytische tools. De eerste tool is een soort pronominalisatie, dat wil zeggen een operatie die pronomina behandelt als plaatshouder voor volledige frasen. De tweede tool is de behandeling van grammaticale relaties als primitieven, dat wil zeggen als ongedefinieerde entiteiten (bijvoorbeeld via posities in de boom). De eerste tool stelt ons in staat om het hervattende element te behandelen als een resultaat van pronominalisatie, terwijl de tweede tool ons in staat stelt om een enkele beschrijving van de overeenkomstige condities te geven, omdat ze gezien kunnen worden als een vereiste voor het hervattende element om relationeel equivalent te zijn aan de grammaticale relatie die de echte vraagwoordfrase draagt voor zijn extractie.

Ten derde beargumenteerde ik dat de analyse een aantal interessante theoretische gevolgen heeft. Aan de ene kant kan deze analyse omgaan met de variatie die in vraagwoorddubbelingstructuren gevonden wordt, zoals de variatie binnen het Duits en vraagwoorddubbeling in het Afrikaans. Aan de andere kant kan de analyse gebruikt worden voor een aantal verschijnselen die volledig onafhankelijk zijn van vraagwoorddubbeling, zoals opeenvolgende cycliciteitseffecten, eilandgevoelige *vraagwoord in situ*-constructies, vraagwoordcongruentie-effecten en voegwoordvariatie.

Ten vierde liet ik zien dat een aantal theoretisch controversiële claims die binnen APG worden gemaakt empirisch goed onderbouwd worden. Ik liet bijvoorbeeld zien dat naamvalaffixen en adposities in verschillende talen dezelfde distributie kennen. Dit empirische resultaat verschaft steun aan de APG-analyse die zowel naamvalaffixen als adposities behandelt als vlaggen. Ik beargumenteerde daarnaast dat sommige problemen die vaak worden genoemd als argumenten tegen een analyse die proformen als onderliggend lexicale NP's ziet bij nadere inspectie ongegrond zijn.

Overzicht van de hoofdstukken

In hoofdstuk 1 gaf ik een kort overzicht van het onderwerp van dit proefschrift, de doelstelling en de onderzoeksvragen.

In hoofdstuk 2 onderzocht ik de status van vraagwoorddubbeling in vergelijking met die van andere types vraagwoordextractie die in het Duits voorkomen, en ik beargumenteerde dat vraagwoorddubbeling de status van een normale vraagwoord-extractie heeft. Met andere woorden, vraagwoorddubbeling gedraagt zich in alle opzichten als de normale types vraagwoordextractie, zoals die in (3), en niet zoals het meer eigenaardige type dat de WHAT-constructie genoemd wordt en die in (4) getoond wordt.

(3)   a. Wen glaubst du dass die Ministerin liebt?
          wie geloof je dat de minister houdt
      b. Wen glaubst du liebt die Ministerin t?
          wie geloof je houdt de minister
          Van wie geloof je dat de minister houdt?

(4)   Was glaubst du wen die Ministerin liebt?
        wat geloof je wie de minister houdt
        Van wie geloof je dat de minister houdt?

Het belang van dit resultaat is dat, omdat vraagwoorddubbeling in alle opzichten geconstrueerd wordt als de andere normale extractietypes, zijn eigenaardigheid de aanwezigheid van een extra element - namelijk het hervattende element - is. Dientengevolge moet iedere succesvolle analyse van vraagwoorddubbeling om kunnen gaan met de aanwezigheid en de eigenschappen van het hervattende element.

In hoofdstuk 3 onderzocht ik de morfosyntactische eigenschappen van het hervattende element. Ik liet op basis van voornamelijk nieuwe data zien dat het hervattende element getypeerd is op een manier die vooralsnog in de literatuur onopgemerkt is gebleven. In het bijzonder liet ik zien dat hoewel de naam 'vraagwoorddubbeling' suggereert dat het hervattende element simpelweg een kopie is van de echte vraagwoordfrase, dit aantoonbaar niet het geval is. De data die in dit hoofdstuk worden gepresenteerd laten zien dat het hervattende element een proform is, d.i. het heeft een voornaamwoordelijke kern. Belangrijk is dat dit onafhankelijk is van de status van de echte vraagwoordfrase, die frasaal kan zijn voor sommige Duitse sprekers die vraagwoorddubbeling gebruiken. Daarnaast is getoond dat het hervattende element afkomstig is uit een duidelijk omlijnde set proformen, namelijk de vrije relatiefproformen. Bovendien is het hervattende element onderworpen aan een aantal matchingsbeperkingen met betrekking tot de echte vraagwoordfrase. De meest belangrijke van deze beperkingen is dat het hervattende element dezelfde naamval en adpositionele markering als de echte vraagwoordfrase moet dragen, zoals geïllustreerd wordt in (5).

(5)   a. **Wen** glaubst du <u>wen</u> er die lateinische Sprache lehren wird?
          wie.ACC geloof je wie.ACC hij de Latijnse taal leren zal
      b.* **Wen** glaubst du <u>wem</u> er die lateinische Sprache lehren wird?
          wie.ACC geloof je wie.DAT hij de Latijnse taal leren zal
          Wie geloof jij zal hij de Latijnse taal leren?

> c. **An wen**   denkst du <u>an wen</u>   sie einen Brief schreibt?
>   aan wie.ACC denk   je aan wie.ACC zij een   brief schrijft
> d.* **An wen**   denkst du <u>wem</u>   sie einen Brief schreibt?
>   aan wie.ACC denk   je wie.DAT   zij een   brief schrijft
>   *Aan wie denk jij schrijft zij een brief?*

Het belang van dit resultaat is dat, hoewel het hervattende element niet volledig identiek is aan de echte vraagwoordfrase, het wel gedeeltelijk – in een bepaald opzicht – identiek is aan die frase. De taak van elke analyse is om deze identiteitsvereiste expliciet te maken.

In hoofdstuk 4 beargumenteerde ik dat er geen uniforme analyse voor het hervattende element mogelijk is met de bestaande beschrijvingen van vraagwoorddubbeling en de tools die deze beschrijvingen aanwenden. Ze slagen er niet in de status van ofwel het hervattende element als proform, ofwel zijn matchende eigenschappen met betrekking tot de naamval en adpositionele markering weer te geven. De enige analyse die het potentieel heeft de eigenschappen van het hervattende element te verklaren is er een die het letterlijk behandelt als een gedeeltelijke kopie van de echte vraagwoordfrase. Preciezer gezegd is deze analyse in staat vast te leggen wat de eigenschappen van het hervattende element zijn door het te analyseren als een versie van de echte vraagwoordfrase die een aantal deletie-operaties heeft ondergaan. Het probleem met dit idee is echter dat de specifieke benodigde deletie-operaties puur ad hoc zijn, d.i. niets motiveert deze en alleen deze deletie-operaties.

In hoofdstuk 5 en 6 had ik als doel te tonen dat een uniforme en niet ad hoc analyse tot stand gebracht kan worden binnen het Arc Pair Grammar-framework. Met andere woorden, APG biedt de mogelijkheid om zowel het feit dat het hervattende element een proform is als het feit dat het onderworpen is aan de geobserveerde matchingsbeperkingen uit te drukken. Hoewel de beide hoofdstukken lang zijn, kan de strekking van de analyse kort worden samengevat. De hoofdgedachte achter de analyse is dat het hervattende element geen verarmde versie van de echte vraagwoordfrase is, maar een *apart element*. De reden dat dit element als proform opduikt, heeft te maken met het feit dat de condities die de aanwezigheid van het hervattende element in extractiecontexten reguleren *dezelfde zijn die de aanwezigheid van proformen in APG in het algemeen reguleren*. Met andere woorden, als een apart element is toegestaan in vraagwoorddubbeling, dan kan het alleen een proform zijn. De reden dat dit element dezelfde naamval en adpositionele markering draagt, is een gevolg van weer een ander speciaal idee van APG, namelijk de erkenning van grammaticale relaties als primitieven van een syntactische theorie. Wat deze visie mogelijk maakt, is een nogal triviale analyse van de congruentierealiteit voor naamval en adpostionele markering. *Zowel het hervattende element als de echte vraagwoordfrase houden contact met de grammaticale relatie van het geëxtraheerde element voordat het geëxtraheerd werd.* Aangezien grammaticale relaties de naamval en adpositionele markering bepalen, is het feit dat zowel de echte vraagwoordfrase als het bevattende element overeenkomen op het vlak van deze markeringen simpelweg een gevolg hiervan. Wat de keuze van de relevante proform betreft, beargumenteerde ik dat de condities die de aanwezigheid

van een specifieke proform reguleren alleen toestaan dat de hervattende elementen proformen zijn die uit de set vrije relatiefproformen afkomstig zijn.

In hoofdstuk 7 beargumenteerde ik dat de specifieke analyse voor vraagwoord-dubbeling inzichten in verschijnselen biedt die in het geheel niet verbonden zijn aan vraagwoorddubbeling. In het bijzonder was mijn doel te laten zien dat extractiecontexten en contexten waarin proformen voorkomen een gemeenschappelijke configuratie hebben en dat dit de mogelijkheid schept om om te gaan met een aantal onverwachte proformen, zoals reflexieven die morfologische reflexen van passivisatie zijn. Ik beargumenteerde ook dat de behandeling van extractie en de manier waarop de grammaticale relatie van de vraagwoordfrase behouden wordt een verenigde behandeling van vraagwoordcongruentie en voegwoordvariatie-effecten toestaat, waarvan de meest bekende het *that*-spooreffect is. Daarnaast staat de analyse die nodig is voor de positie van het hervattende element een simpele behandeling van opeenvolgende cycliciteitseffecten en eilandgevoelige *vraagwoord in situ*-constructies toe. Ten slotte laat dit hoofdstuk zien dat naamval en adpositionele markering dezelfde eigenschappen in verschillende talen vertonen, wat de bewering dat ze identiek zijn ondersteunt.

In hoofdstuk 8 liet ik zien dat de analyse die ik voor een erg liberale soort van vraagwoorddubbeling in het Duits ontwikkeld heb, ook gebruikt kan worden voor de analyse van een meer beperkte soort van vraagwoorddubbeling in het Duits, één waar noch complexe vraagwoordfrasen noch d-pronomina toegestaan zijn. Ik beredeneerde dat beide aspecten volgen uit een enkele beperking die toegevoegd wordt aan de regel die verantwoordelijk is voor vraagwoorddubbelingstructuren.

In hoofdstuk 9 presenteerde ik een korte conclusie en vatte de belangrijkste resultaten van dit werk samen.