

Possessive Relatives and (Heavy) Pied Piping

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Abstract. This article discusses the phenomenon of pied piping in restrictive relative clauses in the Germanic languages Dutch, German and English. Since it concerns possessive relatives primarily, an integrated approach to the syntax of relativization and attributive possession is sought for. Possessive relatives directly reflect the three basic types of attributive possession, namely the prepositional, the genitive and the possessive pronoun construction. It is claimed that the promotion theory of relative clauses can be successfully combined with an analysis of possession in which the prepositional construction is taken to be the basis for the other types. Furthermore, it is shown that heavy pied piping is normally dependent on the presence of a prepositional phrase. In general, pied piping is claimed to be a possible consequence of overt or covert head movement. Finally, the effect of the so-called R-transformation on pied piping and preposition stranding in relative clauses is discussed. The different possibilities shown by English, Dutch and German are argued to be consequences of the theoretical possibilities of creating a syntactic relation, namely by XP movement, overt head movement, or covert movement.

Keywords: (syntax), relative clauses, pied piping, (attributive) possession, relative pronouns, raising/promotion, preposition stranding, genitive.

0. Introduction

Pied piping is a common phenomenon in the Germanic languages. For relative constructions, it means that material may be raised along with the relative pronoun or operator. Often, the raised constituent is possessive. This is similar to the situation in questions. However, since a relative clause is embedded and connected to an antecedent, the situation is much more complex. In this article I will try to integrate the syntax of restrictive relativization with that of possession and pied piping. Thus, I intend to provide a detailed syntactic description of possessive relatives and other instances of (heavy) pied piping.

As an illustration, consider the following data from Dutch. Syntactically, there are at least three different ways to shape a possessive relative. We can use a morphological genitive, a relative plus a possessive pronoun, or a prepositional genitive:

- (1) a. de man wiens vader ik ken
the man whose father I know
- b. de man wie zijn vader ik ken
the man who his father I know
‘the man whose father I know’
- c. de man van wie ik de vader ken
the man of who I the father know
‘the man whose father I know’

Here *wiens* ‘whose’ and *wie* ‘who’ are relative pronouns.¹ Furthermore, *zijn* ‘his’ is a possessive pronoun, *van* ‘of’ a preposition, and *de* ‘the’ a definite non-neuter article. The phrases have the same meaning.

It seems that the possessive parts in these constructions correspond to the attributive phrases in (2). The examples in (1a) and (2a) contain a prenominal genitive; in (1b)/(2b) we have a ‘topic plus possessive pronoun construction’; and the variant in (1c)/(2c) contains a periphrastic genitive using the preposition *van* ‘of’.²

- (2) a. 's mans vader
 the_{gen} man_{gen} father
 ‘the man’s father’
 b. de man zijn vader
 the man his father
 ‘the man’s father’
 c. de vader van de man
 the father of the man
 ‘the man’s father’

I will show how the theory to be presented for attributive possessives can be applied in possessive relatives within the framework of the so-called promotion theory of relative clauses, also known as head raising analysis. Furthermore, I will address the motivation – in terms of feature checking – for the various movements that are necessary in the derivation of phrases like (1).

Section 1 starts with some preliminary remarks and an outline of the relevant data in English, Dutch and German. Section 2 contains a brief discussion of the syntactic model adopted here, the raising analysis of relative clauses, and the syntax of attributive possession. Then the interaction of these in Dutch possessive relatives is the subject of Section 3, which also examines instances of heavy pied piping, sometimes called ‘massive pied piping’. Section 4 discusses the equivalent constructions in English and German, and some differences between the three languages. Section 5 deals with the issue of pied piping versus preposition stranding, and the use of ‘R-pronouns’. Section 6 concludes the article.

1. Preliminaries and outline of the data

This section contains some preliminary remarks and a brief pre-theoretical overview of the linguistic aspects that are relevant for the present subject.

1.1. Possessive pronouns, ϕ -features and Case

¹ In Dutch, *wiens* is masculine singular, and *wier* feminine singular or plural (f/m). The latter has become very formal, if not archaic. Thus it seems that *wiens* is shifting from a morphological genitive to a Saxon genitive, which is inert to number or gender.

² In fact, morphological genitives are archaic in modern Dutch. Phrases like ‘s *mans* are not productive. The topic plus pronoun construction in (1b) and (2b) has a colloquial flavor in the standard language, but is completely acceptable in many dialects and also in Frisian. Furthermore, this ‘doubling construction’ exists in West Flemish and Norwegian; see e.g. Haegeman (2003) and Delsing (1998), respectively. Often, the pronoun is lexically reduced to *z’n* ‘his’ or *d’r* ‘her’ in Dutch, but that is by no means necessary (contrary to what is often suggested in the literature).

In German, possessive pronouns have inherent ϕ -features, but, like adjectives, they are also inflected for ϕ -features and Case: they agree with the possessee. This is shown in (3):

- (3) *mein-e Mutter* *unser-en Cousin-e-n* *ihres Vaters*
 my-F.SG.NOM mother *our-F.PL.DAT cousin-F-PL* *her-GEN father-GEN*

It is important to see that a possessive pronoun is not the genitive of a personal pronoun (cf. *meiner* ‘I-GEN’ versus *mein (Buch)* ‘my-M.SG.NOM (book)’), since it is inflected for Case itself (this is also clear from e.g. Icelandic and Latin); potential confusion is caused by the fact that there is some syncretism in the paradigms.

In the topic plus possessive pronoun construction (also called ‘adnominal dative’), the topic functions as an antecedent for the possessive pronoun, so there is agreement in inherent ϕ -features. Furthermore, the topic has a fixed dative Case, whereas the Case of the possessive pronoun and the possessee (which is the lexical head of the construction) depend on the syntactic context; see e.g. (4):

- (4) [[*Dem Mann*] ^{ϕ_1} _{DAT} [*sein* ^{ϕ_1} -*e* _{ϕ_2} *Mutter* _{ϕ_2}]_{NOM}]_{NOM} *hat kein Geld*.
 the man *his mother* *has no money*
 ‘The man’s mother has no money.’

This construction is very colloquial in standard German, but we find it in many dialects, and also in Frisian and Dutch.

As mentioned in the introduction, the same elements can be found in relative constructions. A relative pronoun can be used in the genitive Case:

- (5) *der Mann* ^{ϕ} ,*dessen* ^{ϕ} _{GEN} *Frau*_{ACC} *ich kenne*
 the man *whose* *wife* *I* *know*

Note that the relative pronoun’s inherent ϕ -features are in agreement with the antecedent, not with the possessee (in German *dessen* is male, *deren* female). There is no ϕ -feature inflection.

If a topic plus possessive pronoun construction is used, we find the same pattern as in (4). The following phrase (in German spelling) is acceptable in colloquial Hessisch (Holger Hopp, p.c.):

- (6) *die Frau* ^{ϕ_1} , *der* ^{ϕ_1} _{DAT} *ihr* ^{ϕ_1} -*en* _{ϕ_2 , ACC} *Vater* _{ϕ_2 , ACC} *ich kenne*
 the woman *whom* *her* *father* *I* *know*
 ‘the woman whom her father I know’

This construction is also found in (colloquial) Dutch and Frisian, but not in standard German.

I assume that the agreement patterns concerning ϕ -features and Case in the constructions at hand, which are shown overtly in this subsection, are abstractly present in Germanic in general. The formal syntax of attributive possessive constructions is discussed in Section 2.3.

1.2. 'Simple' possessive relatives: some patterns

The three related constructions in Dutch to be considered in detail below are repeated in (7).

- (7) a. de man wiens vader ik ken
the man whose father I know
b. de man wie zijn vader ik ken
the man who his father I know
'the man whose father I know'
c. de man van wie ik de vader ken
the man of who I the father know
'the man whose father I know'

The equivalent phrases in German are given in (8). In standard German the possessive pronoun construction is not possible.

- (8) a. der Mann dessen Vater ich kenne
the man whose father I know
b. * der Mann dem seinen Vater ich kenne
the man who his father I know
int. 'the man whose father I know'
c. der Mann von dem ich den Vater kenne
the man of who I the father know
'the man whose father I know'

In English, a similar restriction applies (but for a different reason; see Section 4):

- (9) a. the man whose father I know
b. * the man who(m) his father I know
c. the man of whom I know the father

Some further patterns emerge from the data. First note that all Dutch possessive relative constructions contain a relative pronoun in *w*-format; compare (7) to (10):

- (10) a. * de man diens vader ik ken
the man whose_d father I know
int. 'the man whose father I know'
b. * de man die zijn vader ik ken
the man who_d his father I know
int. 'the man whose father I know'
c. * de man van die ik de vader ken
the man of who_d I the father know
int. 'the man whose father I know'
d. de winkel waarvan/*daarvan ik de eigenaar ken
the shop whereof/*thereof I the owner know
'the shop of which I know the owner'

This is striking, since the normal relative pronouns are *die* and *dat* with a *d*, e.g. *de man die ik ken* ‘the man whom I know’. In fact, in Middle Dutch (10a-c) was correct; and it is still this way in present-day German, cf. (8a/c). I will show below that the data in (10) are related to the structural presence of a preposition in possessive contexts.

Second, if the possessum forms a constituent with the relative pronoun, e.g. *wiens vader/wie zijn vader* ‘whose father’ in (7a/b), an article may not be expressed; see the contrast with (11b)/(12). The facts are similar in English and German (11a/c):

- (11) a. the man whose (*the) father I know
 b. de man wiens (*de) vader ik ken
 c. der Mann dessen (*den) Vater ich kenne

- (12) de man wie zijn (*de) vader ik ken
*the man whohis (*the) father I know*
 ‘the man whose (*the) father I know’

The situation in simple attributive phrases is the same, e.g. *John’s (*the) book*. This suggests that prenominal possessors in general are somehow connected with the article position. For postnominal genitives this is not the case, e.g. *the father of John; a book of John’s*. In relative clauses – as in questions – a prepositional phrase can be preposed or independently generated (depending on the particular construction), so that the prepositional genitive and the possessed noun phrase are separated; in that case the article of the latter is expressed as well, e.g. *van wie...de vader* ‘of whom... the father’, as in (7c), (8c) and (9c). Note that the possessee can also be indefinite:

- (13) a. the man of whom I know *a* friend
 b. de man van wie ik *een* vriend ken
 c. der Mann von dem ich *einen* Freund kenne

I will not engage in the discussion concerning the definiteness of constructions with prenominal possessors – but see e.g. Woisetschlaeger (1983), Barker (1995) and Taylor (1996).

Furthermore, if the relative pronoun and the possessed noun phrase are separated, a preposition (*van* ‘of’) is obligatory (see Section 5 for P-stranding):

- (14) a. the man *(of) *whom* I know *the father*
 b. de man *(van) *wie* ik *de vader* ken
 c. der Mann *(von) *dem* ich *den Vater* kenne

On the other hand, if a (genitive) relative pronoun and the possessed noun phrase are one constituent, this preposition is impossible; see the following examples:

- (15) a. the man (*of) *whose father* I know
 b. de man (*van) *wiens vader* ik ken
 c. der Mann (*von) *dessen Vater* ich kenne

- (16) de man (**van*) *wie zijn vader* ik ken
 *the man (*of) who his father I know*
 ‘the man (*of) whose father I know’

Thus, there seems to be a complementary distribution between the preposition *of* on the one hand and possessive pronouns and genitive Case on the other hand. Section 2.3 discusses this from a theoretical point of view.

Finally, note that the possessive constituent in (7a/b), (8a) and (9a) cannot be split; see (17) and (18):

- (17) a. * the man *whose* I know (*the*) father
 b. * de man *wiens* ik (*de*) vader ken
 c. * der Mann *dessen* ich (*den*) Vater kenne

- (18) * de man *wie zijn* ik (*de*) vader ken
 the man who his I (the) father know
 int. ‘the man whose I know (the) father’

This is similar in non-relative contexts. The more general issue of ‘left branch extraction’ is discussed in e.g. Corver (1990).

1.3. *Echo readings and pied piping*

If a question word is stressed, an echo/quiz reading is possible, and *wh*-movement is unnecessary; see (19):

- (19) You did WHAT?

Therefore, the question word can be in an island position:

- (20) a. You made the claim that John bought WHICH books?
 b. * WHICH books did you make the claim that John bought _ ?

We may argue that there is no *wh*-feature in echo questions. Then how do we explain the sentences in (21), where there is fronting?

- (21) a. WHAT did you do?
 b. The information about the residence of WHOM did you destroy?

The answer is that (21) does not necessarily show question *wh*-movement, but a kind of topicalization of the direct object, which *contains* an echo question word.³ Of course (21a) can also be interpreted as *wh*-movement in combination with emphasis, but if (21b) involves *wh*-movement, it would imply pied piping of a large constituent. However, in a normal question this type of heavy pied piping is impossible – hence (21b) must have an echo reading. This is confirmed by the fact that embedding the question is unacceptable:

³ In V2 languages (Dutch, German) topicalization and *wh*-movement are structurally similar. In English it is not immediately clear why there is auxiliary insertion in (21).

- (22) * Bill wondered/asked the information about the residence of whom you destroyed.

Since an echo reading is unavailable in an embedded question, (22) cannot be saved.

The same point can be illustrated in Dutch; see (23) and (24):

- (23) a. De informatie over de woonplaats van WIE/*wie heb je vernietigd?
the information about the residence of whom have you destroyed
 b. De originele uitgave van WIENS/*wiens inmiddels vergeten boeken is
the original print of whose presently forgotten books has
 de verstrooide professor kwijtgeraakt?
the absent-minded professor lost
 ‘The original print of WHOSE presently forgotten books did the absent-minded professor lose?’
- (24) a. * Bill vroeg de informatie over de woonplaats van wie je hebt vernietigd.
 b. * Bill vroeg de originele uitgave van wiens inmiddels vergeten boeken de verstrooide professor is kwijtgeraakt.
 ‘Bill asked...’

Clearly, the sentences in (23) are only acceptable in an echo reading.

In relative clauses – which are also embedded – a relative pronoun cannot receive an echo interpretation:

- (25) a. * the man WHOM I saw
 b. * the man I saw WHOM

Furthermore, there is obligatory *wh*-movement of a relative pronoun or operator (see Section 2.2 for an explanation). Therefore, the examples in (26) involve heavy pied piping:

- (26) a. * de man de informatie over de woonplaats van wie jij vernietigde
the man the information about the residence of whom you destroyed
 b. * Ik ken de schrijver de originele uitgave van wiens inmiddels
I know the writer the original print of whose presently
 vergeten boeken de verstrooide professor kwijtgeraakt is.
forgotten books the absent-minded professor lost has

However, as in questions, this type of heavy pied piping is unacceptable. This will be explained in Section 3.2.

1.4. Heavy pied piping and prepositions

In general, it is not the case that heavy pied piping in relative clauses is impossible. I think the following generalization holds: *prepositional phrases facilitate heavy pied piping*.⁴ This explains the following contrast in Dutch:⁵

- (27) a. Ik ken de man *met de vader van wiens vrouw* je gisteren hebt
 I know the man with the father of whose wife you yesterday have
 gesproken.
 spoken
 ‘I know the man to the father of whose wife you spoke yesterday.’
 b. * Ik ken de man *de vader van wiens vrouw* je hebt uitgenodigd, niet.
 I know the man the father of whose wife you have invited, not
 int. ‘I don’t know the man the father of whose wife you invited.’

Heavy pied piping in (27b) is unacceptable – but in (27a), where the pied piped phrase is even larger, it is fine. The difference is that there is an additional preposition in (27a). More data from Dutch are presented in Section 3.2.

The same observation holds in German and English. This is discussed in Section 4. I should note that the contrast in English is less sharp for some speakers. A reviewer gives the following examples:

- (28) a. ?? I need a book *the cover of which* is not defaced.
 b. I need a book *on the cover of which* no one has written.

Fabb (1990:64) gives (29), in which pied piping is comparable to (28a):

- (29) * The man *the mother of whom* I met yesterday is a French speaker.

By contrast, Ross (1967:121) presents (30a), and Safir (1999:599) presents (30b) as acceptable:⁶

- (30) a. Reports *the height of the lettering on the covers of which* the government
 prescribes should be abolished.
 b. a man *pictures of whom* I would like to see

This is in contradiction with the previous examples. However, Webelhuth (1992:128ff) claims that examples like (30) are only apparent counterexamples. He shows that they

⁴ A similar observation has been made for French in Kayne (1976:261). A reviewer objects that Ross (1967) shows examples in which preposition stranding is favored over pied piping. An illustration would be: *(*)of who(m) are you trying to get hold of*? (Ross 1967:134). However, examples like these do not involve heavy, but simple pied piping at best; my claim is that heavy pied piping regularly involves a PP, not that every instance of *wh*-movement must be a PP. Notice, in this respect, that *wh*-movement of a large phrase does not necessarily involve heavy pied piping, since the *wh*-word can be the highest determiner, e.g. in *which book by a Greek author*. Furthermore, the idea that ‘percolation’ or whatever is assumed to cause pied piping can be blocked in some cases (e.g. in an idiomatic phrase like *to get hold of X*) is not at all at odds with my proposal.

⁵ According to the raising analysis of relative clauses, the head noun *man* in (27) is also part of the pied piped phrase. This will be discussed in the next sections.

⁶ Safir also accepts (29), but with a different tense and aspect: *the man the mother of whom I had never met*.

are ungrammatical in *all* the other Germanic languages. Furthermore, pied piping like this is never possible in (embedded) questions; see e.g. (31):

- (31) a. * I asked *the rumors about whom* shocked him.
 b. * I asked Bill *proud of whom* he has always been.

Thirdly, the examples are stylistically marked (this is also noted in Murphy 1995). Webelhuth (1992:130) argues that (30) involves topicalization, not ‘percolation’: “the exceptional cases of pied piping are indeed instances of topicalization in which what looks formally like a relative pronoun is interpreted as an indexical pronoun”. I will leave it at this, and disregard (30) in the remainder of this article.

1.5. Restrictive versus appositives relatives

In Dutch, there is virtually no difference between restrictive and appositive relatives with regard to pied piping. For instance, the generalization discussed in the previous section holds for appositives as well:

- (32) a. ?* Ik zag Joop, *de vader van {wie, wiens vrouw}* jij ook kent.
 I saw Joop, the father of {whom, whose wife} you also know
 b. Ik zag Joop, *met de vader van {wie, wiens vrouw}* jij had gesproken.
 I saw Joop, with the father of {whom, whose wife} you had spoken
 ‘I saw Joop, to the father of {whom, whose wife} you had spoken.’

According to my informants, German is similar in this respect. In English, however, heavy pied piping in appositive relatives is generally considered to be acceptable; see (33), taken from Fabb (1990:64):

- (33) a. * The men *some of whom* I like arrived yesterday. (restrictive)
 b. The men, *some of whom* I like, arrived yesterday. (appositive)

Safir (1986:679) gives (34), inspired by Ross (1967:121); see also Emonds (1979:224) for comparable examples:

- (34) Those reports, *the height of the lettering of which* the government prescribes, are tedious.

I do not know why English differs from Dutch and German in this respect.

Appositive relatives are syntactically different from restrictives. In De Vries (2002) I claim that appositive relatives are complex appositions which are coordinated to the antecedent.⁷ However, this requires a lot of additional discussion which is not directly relevant here; therefore, I will confine this article to restrictive relatives.

⁷ If so, and if there is raising of the overt antecedent in restrictives (see Section 2.2), heavy pied piping in appositives is a little less heavy than in restrictives in apparently parallel constructions. This may be one clue for future research on this issue.

1.6. The R-transformation

A phenomenon that interferes with pied piping in relative clauses is the so-called R-transformation (e.g. *van wat* → *waarvan* ‘of what → whereof’ in Dutch). In (35) and (36) it is shown that the possibility of preposition stranding is dependent on the R-transformation in Dutch:

- (35) a. de winkel *waarvan* jij de eigenaar kent
 the shop whereof you the owner know
 ‘the shop of which you know the owner’
 b. de winkel *waar/*wat* jij de eigenaar *van* kent
 *the shop where/*which you the owner of know*
 ‘the shop which you know the owner of’
- (36) a. de man *van wie* jij de broer kent
 the man of whom you the brother know
 ‘the man of whom you know the brother’
 b. * de man *wie* jij de broer *van* kent
 the man whom you the brother of know
 int. ‘the man whom you know the brother of’

In other words, pied piping is obligatory if there is no R-transformation. In English, this is not the case; moreover, the R-transformation is absent. In German, the R-transformation is less productive than in Dutch, but it seems that the same constraint concerning pied piping applies; in fact, preposition stranding is quite limited. Furthermore, it turns out that complex pied piping is blocked if there is an R-transformation; see (37):

- (37) Ik ken de winkel *met de eigenaar {van welke,*waarvan}* je gisteren
 I know the shop with the owner {of which, whereof} you yesterday
 hebt gesproken.
 have spoken
 (int.) ‘I know the shop to the owner of which you spoke yesterday.’

This will be discussed in Section 5.

2. Analytic background

As a necessary background for the syntax of possessive relatives, I will summarize the syntax of relativization and attributive possession separately in two subsections. First, however, I should briefly clarify my standpoint with respect to the general framework of syntax, and its consequences for the theory of pied piping.

2.1. Features and pied piping

This paper adopts a Minimalist type of grammar. A syntactic derivation is driven by the need for feature checking. Movement is overt or covert, depending on a language-

particular setting of feature strength. However, following Groat & O'Neil (1996), I will deviate from Chomsky (1995) in at least one important respect: there is no countercyclic movement after Spell-Out (i.e. LF-movement); derivations are strictly cyclic. Thus, the LF and PF interfaces coincide, and there is just one derivational path towards it; all pre-versus post-Spell-Out asymmetries are eliminated. Similar proposals with respect to a 'single output' of syntax are Bobaljik (2002), Brody (1995), Pesetsky (1998), and Broekhuis & Dekkers (2000). For my purposes it is not necessary to postulate a copy theory of movement. Covert movement can simply be analyzed as pre-Spell-Out formal feature movement. Therefore, covert movement is analyzed as head movement in my system. (I will not discuss the possibility of 'covert phrasal movement', as is advocated by e.g. Bobaljik 2002.)

The modification of the syntactic system in terms of a single output is not only a conceptual improvement; there is also a practical difference: it is now theoretically possible that covert movement feeds overt movement. I will show that this enables us to explain certain instances of pied piping. In a nutshell, if a group of formal features including *wh* moves to a higher head X for some reason, then it is the projection XP that will undergo overt *wh*-movement later in the derivation.⁸

The idea of covert head movement obviates the need for an explicit mechanism of feature percolation for pied piping (see e.g. Cowper 1987, inspired by Lieber 1981).⁹ As a consequence, we do not need to stipulate constraints on percolation, since limitations on pied piping will follow from the restrictions on (head) movement.¹⁰ Nevertheless, the minimal type of percolation, namely percolation by projection, must of course be granted; that is, XP has all the features of X. For instance, the phrase *which man* can be *wh*-moved as a whole, because it is headed by the determiner *which*. Furthermore, it has been noticed by many authors that a *wh*-phrase in a specifier position can cause pied piping (see e.g. Webelhuth 1992); for example, the phrase *whose daughter's suitcase* can be *wh*-moved. There are two possible explanations for this type of pied piping. Moritz & Valois (1994), Grimshaw (2000) and others assume that (recursive application of) spec-head agreement may cause pied piping. However, following the definitions by Chomsky (1995:177ff), we can also say that a phrase XP in the spec of (the spec of...) YP is in the minimal checking domain of the head H in the spec of which YP resides (e.g. in SpecCP after *wh*-movement).

A note on locality with respect to (covert) head movement is in place here. In general, I will assume the gist of Relativized Minimality (Rizzi 1990), more recently implemented in terms of 'shortest move' or 'minimal link' in Chomsky (1995). The Minimal Link Condition (p. 311) says: "K attracts α only if there is no β , β closer to K than α , such that K attracts β ". The MLC is less strict than the 'head movement constraint' in Travis (1984), which says that movement of a head across another head is ungrammatical in all cases, but the effects are similar to a considerable degree. Nevertheless, we will encounter a particular instance of 'long head movement' in

⁸ I will restrict myself to instances of overt pied piping; I will not go into possible instances of LF pied piping and LF intervention effects (see e.g. Safir 1986, Choe 1987, Moritz & Valois 1994, Bianchi 1995, and Sauerland & Heck 2003).

⁹ However, Koster (2000a) claims that 'percolation' is a property of the operation Merge. If α and β are Merged into γ , the features of γ do not simply equal those of either α or β (one of both projects), but they are a subset of the union of α and β . Along these lines, one may be able to eliminate covert and even overt movement altogether in future research. Issues that need to be addressed are the selection of the particular feature subset, locality effects and the spell-out position of phonological material.

¹⁰ For more discussion on pied piping and percolation, see Ross (1967), Nanni & Stillings (1976), Ishihara (1984), Cowper (1987), Webelhuth (1992), Simpson & Bhattacharya (1999), Grimshaw (2000), Heck (to appear).

Section 3.2. Furthermore, notice that there is nothing which inhibits movement of a head across projection boundaries; so we can derive Y_i+X $[_{UP}[_{VP}[_{WP} t_i \dots$ where Y moves to X from an embedded (but adjacent) position.

Finally, consider the nature of (covert) head movement. I will assume that it is not structure building; therefore, the moved head is truly integrated with the target, features are matched automatically, excorporation is impossible, and the features of the moved head will be part of the projection as well.¹¹

2.2. The syntax of relativization

I will assume a particular approach to relativization, the so-called promotion analysis.¹² The basic idea of promotion or *raising* was proposed in Schachter (1973) and Vergnaud (1974, 1985). Later it has been modernized and combined with the *D-complement hypothesis* by Kayne (1994). An improved and fully detailed discussion is provided by Bianchi (1999, 2000) and De Vries (2002). Thus consider (38), a postnominal restrictive relative construction.

(38) The book that you recommended is sold out.

According to the raising hypothesis, the head noun *book*, i.e. the antecedent NP, originates within the relative clause (at the position of the gap) and is raised to the front. The D-complement hypothesis means that the relative clause is the complement of the outer determiner *the*, which takes scope over the whole construction (contrary to the situation in appositive relatives). Thus, (38) is analyzed as (39):

(39) $[_{DP} \text{The } [_{CP} \text{book}_i \text{ that you recommended } t_i]]$ is sold out.

This *promotion theory* offers a natural explanation for the well-known connectivity effects between the antecedent and the gap. An example of such an effect in Dutch is given in (40), where the anaphor embedded in the antecedent (*zichzelf*) is bound by the subject of the subordinate clause (*Joop*):

(40) De [verhalen over zichzelf]_i die_k Joop_i gisteren hoorde, waren pure leugens.
the stories about SE-SELF which Joop yesterday heard, were mere lies
 ‘The stories about himself that Joop heard yesterday were mere lies.’

Notice that the relative pronoun has another referent, as indicated by the subscripts.¹³ Consequently, it is necessary to reconstruct the complete head NP in order to establish

¹¹ In this way we circumvent some of the problems associated with Chomsky’s head adjunction. It seems to me that by covert head movement as described we can create extended projections in the sense of Grimshaw (2000).

¹² For those who are skeptical about this theory, I will add a note at the end of Section 3.1 which shows how the analytic results for pied piping and possession can be transferred to a right-adjunction theory of relative clauses. If I am correct, the phenomenon of pied piping and possessive relatives do not provide an argument for or against one of both theories of relative clauses. This in itself might be considered surprising, since I have encountered a ‘general feeling’ that pied piping is problematic for head raising (see also Bianchi 1995:265). Thus, this feeling is proven to be premature in this article, a conclusion which is in line with Bianchi’s work.

¹³ Neither could a potential PRO subject of NP serve as an antecedent for *zichzelf* in this example, since PRO would be the ‘story-teller’, whereas *Joop/zichzelf* is the hearer.

the binding relation between *Joop* and *zichzelf*. This is only possible if NP was raised from the direct object position in the relative clause to begin with.¹⁴

Moreover, the promotion theory enables us to generalize over different types of relative constructions. Especially relevant in this respect are internally headed relative clauses (IHRC) and maximalizing relatives (see Grosu & Landman 1998). An illustration of an IHRC is (41), a Mohave example taken from Lehmann (1984:111).

- (41) [[Hatčoq ?avi:-m ?-u:ta:v]-n^V-č] n^Və?i:l^V-pč.
 [DP [CP dog stone-INST SBJ.I-hit]-DEF-NOM] black-REAL
 ‘The stone with which I hit the dog was black.’
 (or ‘The dog which I hit with the stone is black.’)

Here, the head NP is overtly at the position of what would be the gap in English or Dutch; cf. (39). Therefore, we may assume that raising is parametrized across languages, comparable to *wh*-movement versus *wh*-in-situ. Furthermore, (41) shows that D takes the whole subordinate clause as its complement. (The fact that D is cliticized onto the verb and that it is DP-final – note that Mohave is an OV language – is not relevant here.¹⁵) I think the mere existence of constructions like (41) is bizarre from the perspective of a right-adjunction analysis of relativization.

Borsley (1997) shows that the trace in a relative construction must be a DP-trace. Consequently, the moved constituent must be a DP, too. Traditionally, this is the relative operator, but according to the promotion analysis it is the raised head, e.g. *book* in (39), which gives [DP \emptyset [NP book]]. If so, the relative operator can be identified as the empty determiner in this structure. The operator can be made explicit if a relative pronoun such as *which* is used instead of the relative complementizer *that*. Thus, a relative pronoun/operator is analyzed as the determiner belonging to the head noun – a *relative determiner* in Bianchi’s words. This is depicted in (42):¹⁶

- (42) [DP The [CP [DP book which]_i you recommended t_i]] is sold out.

Note that the surface order of *book* and *which* differs from the regular order of a determiner and noun in English.

In some detail, the syntactic derivation of the restrictive relative construction in (42) is as follows. First the relative determiner *which* selects an NP-complement, *book*. Then NP moves to SpecDP_{rel}; this yields a spec-head relation in which the ϕ -feature agreement between NP and D_{rel} is checked.¹⁷ The relative DP as a whole is selected as

¹⁴ Notice that Dutch *zichzelf* is a true local anaphor, contrary to English *himself*, which is manifold ambiguous and has long-distance uses. Therefore, (40) is a strong argument for raising.

¹⁵ There is reason to believe that the clause has moved to SpecDP; see further De Vries (2002) and the references there.

¹⁶ A reviewer remarks that this bracketing is problematic for extraposition. This, however, depends on the theory of extraposition. De Vries (1999, 2002) argues that extraposition is an instance of specifying coordination (following Koster 2000b), whereby part of the matrix is syntactically repeated, but phonologically deleted – except for the new material, which is a relative clause in this case. Another type of partial deletion is advocated by Wilder (1995), who analyzes extraposition as partial pronunciation of the lowest copy of the (leftwardly moved) antecedent.

¹⁷ This step requires some discussion. In the languages under review, the ϕ -features of determiners are weak. Therefore, checking is normally covert, i.e. the formal features of N move to D (see below), e.g. in *the man*. However, in principle there are three ways of creating a checking configuration: phrasal movement to a specifier position, overt head movement and covert head movement. It is only for economy reasons that covert checking is preferred in the case of a weak feature. But what if the derivation would crash at the interface for some reason if

(43) the book which you recommended is sold out

$[_{DP} [_{D'} [_{D} N_{FF+D}] [_{CP} [_{DPrel} [_{NP} N_{PF}] [_{D_{rel}} t_{np}]]_i [_{C} [_{IP} \dots [_{t_i} AgrO [_{V} t_i]]]]]]] \dots$

2.3. *Attributive Possession*

(44) a. 's mans vader
the_{gen} man_{gen} father
 'the man's father'

b. de man zijn vader
the man his father
 'the man's father'

c. de vader van de man
the father of the man
 'the man's father'

(45) a. de commissaris der koningin
the commissioner the_{gen} queen_{gen}
 ‘the Royal Commissioner’

¹⁸ This is the *wh*-criterion implemented in terms of checking, as in Chomsky (1995).

14

- b. Jans vader
Jan's father

In Dutch, the morphological genitive (44a)/(45a) is not productive anymore. In German, the postnominal genitive is still productive, but the prenominal one is not. However, in both languages a residue of the prenominal genitive exists in the form of the Saxon genitive (45b) and in possessive relative clauses (*de man wiens vrouw...* ‘the man whose wife...’). Therefore, we have to consider the syntax of prenominal genitives.

Several authors have shown that the English ’s-construction is very different from a morphological genitive; see e.g. Janda (1980) and Weerman & De Wit (1998). In Middle English the genitive ’s was reinterpreted as a weak form of the possessive pronoun *his*: e.g. ‘the man ~~hi~~s father’. Therefore, I assume that its present syntax equals the possessive pronoun construction (see below). Notice that *the man that I saw's friend* cannot be expressed by a prenominal genitive, but it can be translated in Dutch with a possessive pronoun construction: *de man die ik zag z'n vriend*. Thus, there are two types of Saxon genitives. The English type is related to the possessive pronoun construction; the Dutch/German one is related to the prenominal morphological genitive.

Let us turn to the formal syntax of attributive possession. Since Abney (1987), building on Szabolcsi (1984), divided the noun phrase into a lexical domain (NP) and a functional domain (DP, etc.), it is generally assumed that genitive phrases are generated in NP and, possibly, moved into the functional domain (see e.g. Szabolcsi 1994 and the references there). Following ideas by Chomsky (1970), Delsing (1993, 1998), Postma (1997) and others, I assume that all genitive phrases – whether periphrastic or morphological – are (initially) a complement of N.

It is thinkable that deverbal nouns have a subject, but Lindauer (1998) warns that there are no syntactic arguments to distinguish between *genitivus subiectivus*, *obiectivus* and *possessivus* (which in turn has a whole range of possible interpretations: whole-part, kinship, alienable possession, etc.).²⁰ Notice that what seems to be a thematic subject of N can be phrased as a postnominal morphological or prepositional genitive, e.g. *the robbery of Robin Hood*, *a letter of John*. It seems unlikely to me, however, that these PPs could be generated as the subject in SpecNP. Furthermore, the distinction between ‘relational’ and ‘absolute’ nouns is not very sharp (cf. Delsing 1993:147); in fact it is often context-dependent. I fail to see why alienable possession, e.g. *John's car*, needs to be singled out syntactically from other types of possession, e.g. *John's father*, *the table's leg*. The head nouns of the last two examples, *father* and *leg*, are not subcategorized for a possessor in an obvious way, and surely alienable possession expresses some relation between two nouns as well.²¹ Postma (1997:278) states that “possession is a specific interaction between two NPs rather than a property of just one

²⁰ Thus there is just one *genitivus thematicus*. Despite his own conclusions, Lindauer generates a subject in SpecNP in a deverbal NP with two arguments such as *Kolumbus' Entdeckung Amerikas* ‘Columbus's discovery of America’. I do not see why this is necessary; but perhaps Lindauer is reluctant to assume a double object construction in NP.

²¹ De Wit (1997) argues that it is an instance of predication, because it can be paraphrased with a copula construction (e.g. *this car is John's*). In her analysis the ‘predicate’ (e.g. *John's*) is generated as an adjunct to its subject (e.g. *car*) – in fact *inside* the extended projection of the subject: it is adjoined to NP within DP. I find this very unattractive. Note also that De Wit's view is incompatible with a small clause approach to predication: [_{SC} DP_{subj} XP_{pred}]. Moreover, I disagree with her analysis of the double genitive (e.g. *a friend of John's*) – which she also considers as a simple predicate – since this analysis disregards its partitive character, as discussed extensively by Barker (1998).

of them”. We may take a certain syntactic configuration to mean ‘possession/genitive’, which can be interpreted in various ways – but not in any way; see also Nikiforidou (1991), Taylor (1996), Heine (1997) for discussion.²² In this article, I will use the term possession in the sense of ‘generalized possession’, not just ‘ownership’ (canonical possession).

If genitives are complements of N, how are they Case-licensed? First consider the periphrastic construction:

(46) [DP the [NP father [PP of [DP the man]]]]

Since prepositions are oblique Case licensors, no particular assumptions are necessary here.²³ In German, *von* ‘of’ assigns morphological dative; in Dutch and English *van/of* requires an object form if we use a pronoun.

A postnominal genitive (as in German) is also an *in situ* argument of N (cf. Delsing 1998). I will assume that there is an abstract preposition which licenses genitive Case:

(47) [DP der [NP Vater [PP P [DP des Mannes]]]]
 the father ϕ the_{gen} man_{gen}

I reject the structural Case approach to genitives/possessives.²⁴ The prepositional shell in (47) is equivalent to the Kase Phrase proposed in Bittner & Hale (1996) and Bayer et al. (2001), who elaborate on the well-known connection between morphological Case and prepositions.

²² According to Nikiforidou the interpretations of the genitive are organized in a network of conceptual relationships, i.e. an instance of structured polysemy on the basis of metaphorical links, which start out from a prototypical meaning (‘ownership’). Taylor stresses the discourse function of the prenominal genitive; see below.

²³ The more general issue how a preposition licenses Case in a Minimalist type of grammar is beyond the scope of this article.

²⁴ Bayer et al. (2001) emphasize the – morphologically grounded – differences between the oblique genitive (as well as the German dative – differently from indirect objects in English), and the structural Cases, nominative and accusative. This can be taken as evidence against the approach in e.g. De Wit (1997) and Lindauer (1998), who treat the morphological and the prepositional genitive as a structural Case, which is to be checked in a functional projection (NumP/FP) above NP. (The NumP is argued for in Ritter 1991 on the basis of Modern Hebrew. It is far from clear that NumP can be transferred to Germanic in the way De Wit proposes. To mention just one objection, in Ritter’s article a ‘subject’ possessor may move to SpecNumP; in De Wit’s book Num checks the equivalent of accusative. Furthermore, Ritter’s arguments are partly based on the assumption that a possessor is a thematic subject of NP, a claim which was criticized above.) Supposedly, prenominal possessors, including possessive pronouns, are licensed in another projection, PosP/AgrNP. (Note that there is evidence for a functional projection below DP in languages like Hungarian – cf. Szabolcsi 1984, etc. – where an article can precede a possessor, and there is an agreement morpheme on the head noun. Again, it is not self-evident that this projection is active in the Germanic languages.) Thus, prenominal possession and genitive would be equivalent to nominative and accusative, respectively. However, these assumptions are highly problematic. If a noun has an (apparent) thematic subject, it is predicted to surface as a prenominal possessor, e.g. *John’s letter*. Nevertheless, *the letter of John* is also fine, which is unexpected, unless there is something like the reverse of a passive transformation in noun phrases. Conversely, (apparent) thematic objects can surface as genitives but also as prenominal possessors, e.g. *the release of the prisoners*; *the prisoner’s release*. These constructions would have to be considered as optionally unaccusative, then. Furthermore, De Wit argues that possessors in alienable possessive constructions, e.g. *John’s table* or *de tafel van John* [Dutch], are not arguments but predicative adjuncts to N. Then how come these show ‘nominative’ and genitive Case as well? Finally, note that possessive pronouns do not have a fixed ‘structural’ Case, but they agree with the Case of the head noun (cf. Section 1.1 above). Moreover, recall that a possessive topic is objective/dative, not nominative; this can even be tested in Dutch and English: *?hem/*hij z’n broer* ‘?him/*he ’s brother’. Thus, the structural Case approach to possessive constructions is not successful, and I conclude that the genitive in Germanic is an oblique Case. As a consequence, we do not need to postulate any functional projection other than DP for possessive constructions.

Complements of N follow N, regardless of the interpretation; this explains the position of the *postnominal* genitive. How can we derive a *prenominal* genitive? According to Taylor (1996), there is a discourse-related difference between a prenominal and a postnominal possessor, namely the former has a topic function with respect to the head noun; in other words, the reference of the head noun is identified via the possessor. Now, if the DP projection is the nominal counterpart of CP (see e.g. Szabolcsi 1994), it makes sense that a possessor used as a topic is moved to SpecDP.²⁵ This is shown in (48):²⁶

- (48) [DP [PP **P** [DP D NP]] **Ꭱ** [NP N t_{pp}]]
 's mans vader
 Jans vader

Technically, this can be implemented by assuming a strong topic feature.

If there is a possessor topic, an article cannot be expressed (see e.g. Woisetschlager 1983, Barker 1995 and Taylor 1996 for a discussion on the semantics of the construction); therefore, **Ꭱ** is empty in (48): *'s mans (*de/*een) vader* ‘the man’s (*the/*a) father’. However, the determiner position can be used for another element, namely a possessive pronoun, as will become clear in a moment.

Abney (1987) suggests two possible analyses for the *'s* in e.g. *John’s father*. Either it is some kind of Case marker, which results in an analysis like (48), or it resides in D, which gives [DP [John] [D' 's [NP father]]]. Since the English Saxon genitive differs from the Dutch/German one, and it behaves like the Dutch topic plus possessive pronoun construction (44b), as mentioned above, the second analysis is more likely to be correct. This is also the standpoint in Corver (1990).²⁷

Suppose that all Germanic possessive pronouns, including English *'s*, surface in D. This is consistent with several facts: (i) they are heads; (ii) they agree in Case and ϕ -features with the head noun, like articles (at least in German); (iii) they precede the head noun; (iv) they follow a possessive topic, which is in SpecDP; (v) they exclude the presence of an article. Thus, the postulation of a “PosP” projection as in e.g. Delsing (1993, 1998) and De Wit (1997) is unnecessary for Germanic.

One issue remains to be explained so far: where does the possessive form of a possessive pronoun come from? I submit that this is the result of head movement of an (abstract) possessive preposition (“*of*”) to D, as sketched in (49):

- (49) ... P+D_{poss} [NP N [PP t_p ...]
 zijn vader

The determinative part of the possessive pronoun makes it grammatically equivalent to a determiner; the prepositional part causes a (generalized) possessive relation between the head noun and the possessor, which can be made overt as a topic in SpecDP. The derivation of (44b) is given in (50):²⁸

²⁵ A reviewer notes that PPs can undergo DP-internal fronting in colloquial German: *die Gerüchte über Fritz* ‘the rumors about Fritz’ → *über Fritz die Gerüchte*. Although this is a different phenomenon, it confirms the idea that PPs can principally move to SpecDP.

²⁶ This derivation is not the position of Taylor, who works within the framework of Cognitive Grammar.

²⁷ Unfortunately, Corver does not distinguish between *Jans vader* and *Jan zijn vader* ‘Jan’s/his father’ in Dutch.

²⁸ Note that, strictly speaking, (50b) violates the old Head Movement Constraint, but not the Minimal Link Condition: N does not have the features required for possession, so it is not an intervener in this respect.

- (50) a. $D_1 [_{NP} N [_{PP} P DP_2]]$ \rightarrow
 b. $P+D_1 [_{NP} N [_{PP} t_p DP_2]]$ \rightarrow
 c. $[_{DP1} [_{PP} t_p DP_2] P+D_1 [_{NP} N t_{pp}]]$
 de man zijn vader

The proposal in (50) explains the dative/objective Case of the possessive topic. The possessor DP_2 is Case-licensed by the abstract preposition, which is the empty counterpart of *of/van/von*. If P is necessary to build a possessive pronoun, the complementary distribution between periphrastic genitives and possessive pronouns is explained as well, e.g. **zijn_i vader van de man_i* ‘*his_i father of the man_i’.²⁹ Finally, given (50), a simple possessive pronoun construction as in (49) may be argued to involve a *pro* topic.

Let me end this section by listing the surface structures of the possessive constructions at hand. For ease of representation I have left out the covert relations between nouns and determiners:

- (51) a. $[_{DP1} D [_{NP1} N [_{PP} P DP_2]]$ (*prepositional/periphrastic genitive*)
 ‘de vader van de man’, ‘der Vater von dem Mann’, ‘the father of the man’
 b. $[_{DP1} D [_{NP1} N [_{PP} \bar{P} DP_2]]$ (*postnominal morphological genitive*)
 ‘der Vater des Mannes’
 c. $[_{DP1} [_{PP} t_p DP_2] P+D [_{NP1} N t_{pp}]]$ (*topic plus possessive pronoun, or*
 ‘de man zijn vader’, ‘dem Mann sein Vater’ *English Saxon’s genitive*)
 ‘the man’s father’
 d. $[_{DP1} [_{PP} t_p pro] P+D [_{NP1} N t_{pp}]]$ (*simple possessive pronoun*)
 ‘zijn vader’, ‘sein Vater’, ‘his father’
 e. $[_{DP1} [_{PP} \bar{P} DP_2] \bar{D} [_{NP1} N t_{pp}]]$ (*prenominal morphological genitive, or*
 (‘ ’s mans vader’, ‘des Mannes Vater’) *Dutch/German Saxon genitive*)
 ‘Jans vader’, ‘Jans Vater’

Thus, all possessive constructions are structurally related. In each case, a preposition triggers the possessive meaning (which is a certain relation between nominal phrases), and is responsible for the oblique Case licensing of the possessor. Prenominal genitives and the possessive pronoun constructions involve movement of the possessor PP .³⁰

3. Possessive relatives in Dutch

Let us return to possessive relatives. Since Dutch is a little more flexible than standard German and English in this respect (see Section 1.2 above), I will treat the Dutch case first, and postpone the comparison with German and English to the next section.

²⁹ However, apart from this, there is also covert movement of N to D : recall that a possessive pronoun agrees with the head noun from Section 1.1; see also Section 2.2. For ease of representation this movement is left out in (50). Nevertheless, N can have additional prepositional arguments next to the possessor, e.g. *Jan zijn boeken van Darwin over de evolutie* ‘Jan’s books by Darwin on the evolution’. However, a discussion of multiple objects and/or adjuncts in the nominal domain would take us too far astray, here.

³⁰ Since the P position is lexically empty, topicalization of just DP seems to be a possible alternative analysis. Since Spec PP can be filled (see below), I will not generally assume so, but one relevant case is discussed in Section 3.2.

- b. de man {wiens, wie zijn, *diens, *die zijn} vader ik ken
 the man {whose, who his} father I know

Consider what happens in a possessive PP that contains a relative DP. The first example to be derived is (55), where the raised constituent is the PP *man van wie* ‘man of whom’:

- (55) de *man van wie* ik de vader ken
 the man of who I the father know
 ‘the man of whom I know the father’

As stated, in simple (non-pied piping) promotion structures the agreement between D_{rel} and the head NP is checked in a spec-head configuration; hence NP (originally the complement of D_{rel}) moves to $SpecDP_{rel}$. In a PP, however, the formal features of D_{rel} have moved to P – cf. (53) – so NP is attracted to $SpecPP$ instead.³³

- (56) [_{PP} NP $D_{rel,FF+P}$ [_{DP-rel} $D_{rel,PF}$ t_{np}]]
 man van wie

There is another side to D_{rel} ’s formal feature movement to P, namely its *wh*-feature arrives at a higher level. As a consequence, there will be pied piping.³⁴ That is, the PP in (56) is raised to $SpecCP$ of the subordinate clause, where the *wh*-feature can be checked, as is sketched in (57):³⁵

- (57) [_{DP} de [_{CP} [_{PP} man van wie] ... ik de vader t_{pp} ken]]

This gives us the right word order. (Note that after this, the formal features of N move to the outer D for ϕ -feature checking; cf. Section 2.2.)

I will return to the prepositional genitive below. First consider the possessive constructions without *van* ‘of’, where the pied piped constituent is more complex. The relevant examples are repeated in (58):

- (58) a. de *man wiens vader* ik ken
 the man whose father I know

³³ In Minimalist terms, $SpecDP_{rel}$ and $SpecPP$ can be called equidistant from NP, but in fact the D_{rel} -bar level and the specifier position need not be projected at all, here. Notice that if NP enters into a checking relation with $D(P)_{rel}$ before the formal features of D_{rel} move to P, NP would never be able to arrive at the highest position in the subordinate clause; consequently, the ϕ -features of the matrix determiner cannot be checked by the relative head noun, and the derivation will crash. Furthermore, recall that D_{rel} ’s ϕ -features are weak, so they must be checked before the interface is reached, but not necessarily immediately.

³⁴ There is a discussion on the base position of preposed prepositional phrases. Klein & Van den Toorn (1980), based on Akmajian & Lehrer (1976), conclude that they must be interpreted as adverbial phrases – therefore, they are not extracted from NP. This is supported by a minimal pair such as (i/ii), where in (ii) an adverbial interpretation is highly unlikely (but not impossible given a special context).

(i) Van wie heb je een boek gelezen? [of whom have you a book read ?]
 (ii) ?* Van wie heb je een boek afgestoft? [of whom have you a book dusted ?]

However, there are also indications that complement PPs of N (as opposed to adjuncts) can be extracted from NP; see the detailed description in Broekhuis et al. (2003). It is likely that this is the case in (57). Since this issue is not crucial to the discussion here, I will leave it aside.

³⁵ A reviewer asks what prevents direct movement of the *wh*-feature to C (instead of pied piping); in other words, which restrictions are there? A short answer is that feature movement is head movement, and head movement cannot generally skip other heads; see Section 2.1.

- b. *de man wie zijn vader ik ken*
the man who his father I know
 ‘the man whose father I know’

The phrase *man wiens vader* in (58a) is a prenominal genitive. Its internal structure is derived as follows. DP_{rel} originates as the genitive complement of *vader* ‘father’: $N [PP \bar{P} DP_{rel}]$. As before, D_{rel} and \bar{P} are connected; as a consequence, the relative head NP *man* moves to SpecPP instead of Spec DP_{rel} – cf. (56) above. The genitive PP is shown in (59):

$$(59) [PP [NP \text{man}] D_{rel,FF}+\bar{P} [DP_{rel} [D_{rel,PF} \text{wiens}] t_{np}]]$$

Similar to the analysis of normal prenominal genitives (48/51c-e), the possessor is interpreted as a topic and moves to SpecDP:

$$(60) [DP [PP \text{man wiens}] \bar{D} [NP \text{vader } t_{pp}]]$$

Eventually, this complex DP is moved to SpecCP of the relative clause, in accordance with the raising analysis of relative clauses:

$$(61) \text{de } [CP [DP \text{man wiens vader}] \text{ik ken } t_{dp}]$$

Note that the *wh*-feature is in the minimal checking domain of C in this configuration (cf. Section 2.1).

In (58b) things are slightly different, as there is a possessive pronoun. First, \bar{P} and D_{rel} are connected and NP moves to SpecPP, as before (62a). Then, \bar{P} moves to D and forms a possessive pronoun (62b); compare (49/50). The possessor PP is moved to SpecDP in (62c).

$$(62) \begin{array}{ll} \text{a. } [PP \text{NP } D_{rel,FF}+\bar{P} [DP_{rel} D_{rel,PF} t_{np}]] & \rightarrow \\ \text{b. } D_{rel,FF}+\bar{P}+D [NP \text{N } [PP \text{NP } t_{d-rel,ff+p} [DP_{rel} D_{rel,PF} t_{np}]]] & \rightarrow \\ \text{c. } [DP [PP \text{NP } t_p [DP_{rel} D_{rel,PF} t_{np}]] D_{rel,FF}+\bar{P}+D [NP \text{N } t_{pp}]] & \\ \text{man} & \text{wie} & \text{zijn} & \text{vader} \end{array}$$

This complex DP is *wh*-raised to SpecCP of the subordinate clause:

$$(63) \text{de } [CP [DP \text{man wie zijn vader}] \text{ik ken } t_{dp}]$$

As a result, the head NP and the external determiner can be associated (cf. (43)), and the whole structure is inserted into the matrix clause.

I conclude that the analysis of attributive possession and the promotion theory of relative clauses cooperate in a feasible way to derive the possessive relative construction.³⁶

³⁶ As announced in footnote 12, I will show briefly how the results can be transferred to a right-adjunction analysis of relative clauses by examining one example in some detail. Consider (58b) again. The overall structure is given in (i) (cf. 63):

(i) $[DP [D \text{de}] [NP [NP \text{man}]] [CP [DP \text{wie zijn vader}] \text{ik ken } t_{dp}]]]$

3.2. Heavy pied piping

At this point it is possible to have a closer look at the instances of heavy pied piping mentioned in Section 1.4, where it was observed that prepositional phrases facilitate heavy pied piping.³⁷

I will present some more data from Dutch first. The examples in (64) show that pied piping is unacceptable if the constituent to be raised (in italics) is a DP:³⁸

- (64) a. * Ik ken *de man de vader van wie* je hebt uitgenodigd, niet.
I know the man the father of who you have invited, not
 int. ‘I don’t know the man whose father you invited.’
 b. * Ik ken *de man de vader van wiens vrouw* je hebt uitgenodigd, niet.
I know the man the father of whose wife you have invited, not
 int. ‘I don’t know the man the father of whose wife you invited.’
 c. * Ik ken *de man de vader van wie zijn vrouw* je hebt uitgenodigd, niet.
I know the man the father of who his wife you have invited, not
 int. ‘I don’t know the man the father of whose wife you invited.’

Nevertheless, the following sentences are acceptable (although a little hard to comprehend – but that is only a performance problem). The relevant difference is that the raised constituent is a PP in these cases:

- (65) a. Ik ken *de man met de vader van wie* je gisteren hebt gesproken, niet.
I know the man with the father of who you yesterday have spoken, not
 ‘I don’t know the man to whose father you spoke yesterday.’
 b. Ik ken *de man aan de vader van wie* je gisteren hebt gedacht, niet.
I know the man of the father of who you yesterday have thought, not
 ‘I don’t know the man of whose father you thought yesterday.’
 c. Ik ken *de man in de tuin van wie* je gisteren hebt gezeten, niet.
I know the man in the garden of who you yesterday have sat, not
 ‘I don’t know the man in whose garden you sat yesterday.’

Here, the relative CP is right-adjoined to the head NP. In addition, there will be covert N-to-D movement for ϕ -feature checking: the formal features of *man* move to *de*. (This is not indicated for ease of representation.) The structure of the DP *wie zijn vader* is given in (ii) (cf. 62):

- (ii) [DP [PP t_p [DP_{rel} [D_{rel},PF *wie*] [NP \emptyset]]] [D_{rel},FF+P+D *zijn*] [NP vader t_{pp}]]

The relative DP contains a relative pronoun only; the NP position is lexically empty, but there is probably an abstract link with D_{rel} for ϕ -feature checking; hence there is no need for NP movement. DP_{rel} is generated in a possessive PP which is the complement of the possessee. The formal features of D_{rel} are related to the preposition. In turn, the preposition is moved to the higher D; this gives the possessive pronoun *zijn*. Finally, the possessor phrase is topicalized within the larger DP. The *wh*-feature is present in the highest head position; thus, the whole phrase will be pied piped to SpecCP.

³⁷ (Heavy) pied piping is also discussed in Bianchi (1995:Ch6), on the basis of Italian. Although her overall approach and technique are somewhat different, she reaches at least some conclusions that conform to the ones in this article, namely (i) that heavy pied piping can be accounted for within a promotion analysis of relative clauses; and (ii) that D_{rel} and P can enter into a relationship which has the (side-)effect that the movement domain for NP is widened. Notably, all examples presented here are restrictive relatives, contrary to the data in Bianchi (1995), which concern appositive relatives mostly; see also section 1.5.

³⁸ However, see (78) below for a further complication.

- (66) a. Ik ken de *man met wiens vader* jij gisteren hebt gesproken.
I know the man with whose father you yesterday have spoken
 ‘I know the man to whose father you spoke yesterday.’
 b. Ik ken de *man aan wie zijn vader* jij gisteren hebt gedacht.
I know the man of who his father you yesterday have thought
 ‘I know the man of whose father you thought yesterday.’
- (67) a. Ik ken de *man met de vader van wiens vrouw* je gisteren hebt gesproken.
I know the man with the father of whose wife you yesterday have spoken
 ‘I know the man to the father of whose wife you spoke yesterday.’
 b. Ik ken de *man aan de vader van wiens vrouw* je gisteren hebt gedacht, niet.
I know the man of the father of whose wife you yesterday have thought, not
 ‘I don’t know the man of the father of whose wife you thought yesterday.’
 c. Ik haat de *man onder het wiel van wiens wagen* ik gisteren ben gekomen.
I hate the man under the wheel of whose car I yesterday have come
 ‘I hate the man under the wheel of whose car I came yesterday.’
- (68) a. Ik ken de *man met de vader van wie zijn vrouw* je gisteren hebt gesproken.
I know the man with the father of who his wife you yesterday have spoken
 ‘I know the man to the father of whose wife you spoke yesterday.’
 b. Ik ken de *man aan de vader van wie zijn vrouw* je gisteren hebt gedacht.
I know the man of the father of who his wife you yesterday have thought
 ‘I know the man of the father of whose wife you thought yesterday.’
 c. Ik ken de *man in de tuin van wie zijn vrouw* je gisteren hebt gezeten.
I know the man in the garden of who his wife you yesterday have sat
 ‘I know the man in the garden of whose wife you sat yesterday.’

Thus, the question is why does the addition of a prepositional phrase make heavy pied piping possible?

Consider what causes pied piping in the first place. I have argued that D_{rel} is associated to P in relative clauses. For instance, in (69a) the prepositional object of *denk* ‘think’ has the structure in (69b):

- (69) a. de [CP [PP *man aan wie*] ik denk t_{pp}]
 the man of whom I think
 b. [PP NP $D_{rel,FF+P}$ [DP-rel $D_{rel,PF}$ t_{np}]]
 man aan wie

The *wh*-feature belongs to the formal features of D_{rel} , which are moved to P; as a consequence, PP will be *wh*-moved, i.e. pied piped, to SpecCP of the subordinate clause. Another example is (70), where the complex DP is *wh*-moved as a consequence of two previous, independent movements: D_{rel} -to-P and P-to-D (see (62) above for details).

- (70) de [CP [DP *man wie zijn vader*] ik ken t_{dp}]

In short, (head) movement may cause pied piping.

With this in mind, let us examine (64a). The offending phrase is [DP *man de vader van wie*] ‘man the father of whom’. In fact, this phrase cannot be derived. There is a possessive

PP that contains the head NP, as in (56). However, after this PP is selected as the complement of *vader* – and in turn *vader* as the complement of *de*, which gives *de vader man van wie* – no further DP-internal movements are required. Therefore, the *wh*-feature remains within PP, and the complex DP cannot be pied piped to SpecCP. What happens instead is that the embedded PP moves out of DP to SpecCP. This gives (71), which is correct (see also (57) above):

- (71) Ik ken de [_{CP} [_{PP} *man van wie*] je [_{DP} *de vader* *t_{pp}*] hebt uitgenodigd], niet.
 ‘I don’t know the man of whom you invited the father.’

Similarly, the phrase *man de vader van {wiens, wie zijn} vrouw* ‘man the father of whose wife’ in (64b/c) cannot be derived. We would end up with [_{DP} *de vader* [_{PP} *man van {wiens, wie zijn} vrouw*]] at best (this will become evident below). The *wh*-feature is stuck in PP; hence pied piping of the large DP is impossible. What will happen instead is *wh*-movement of an embedded constituent; this gives (72) for example, which is the acceptable counterpart of (64b):

- (72) Ik ken de [_{CP} [_{PP} *man van wiens vrouw*] je [_{DP} *de vader* *t_{pp}*] hebt uitgenodigd], niet.
 ‘I don’t know the man of whose wife you invited the father.’

So far, it is clear why examples like (64) are excluded, and also how relatively simple instances of pied piping can be derived. Now let us turn to the more difficult examples, starting with the pattern in (65), where the constituent to be raised is e.g. *man met de vader van wie* ‘man with the father of whom’. The syntactic elements to be used in the derivation are, in order of appearance (from right to left), *P₁ D₁ N₁ P₂ D_{rel} N₂* (lit. ‘with the father of who man’). As before, *D_{rel}* is covertly associated with a preposition. At this point we will make an additional assumption. Suppose that this preposition is not necessarily the nearest *P*, which is *P₂* here. Thus, the formal features of *D_{rel}* move to *P₁*. (This is an instance of ‘long head movement’, which violates minimality, strictly speaking. In a way it is reminiscent of ‘chain government’, described in Broekhuis 1992.) As a result, the relative head *NP₂* will move to SpecPP₁ for ϕ -feature checking. (Note that *N₁* is already allied to *D₁*.) This is shown in (73):

- (73) [_{PP₁} *NP₂* *D_{rel,FF}+P₁* [_{DP₁} *D₁* [_{NP₁} *N₁* [_{PP₂} *P₂* [_{DP_{rel}} *D_{rel,PF}* *t_{np2}*]]]]]
 man met de vader van wie

Since *D_{rel}*’s *wh*-feature now resides at the highest level, the whole PP₁ will be pied piped to SpecCP; this eventually leads to (74) = (65a):

- (74) Ik ken [de [_{CP} [_{PP} *man met de vader van wie*] je gisteren hebt gesproken *t_{pp}*] niet.

What would happen if *D_{rel}*’s formal features move to *P₂* instead of *P₁* in (73)? As a result, *NP₂* would move to SpecPP₂, which gives *met de vader [man van wie]*. The *wh*-feature remains within PP₂, and the complex PP₁ cannot be pied piped to SpecCP. Unlike the situation in (71/72), the embedded PP₂ cannot move to SpecCP because there is a surrounding PP, PP₁, which is a known barrier for movement in Dutch (unless there is an

R-transformation; see Section 5).³⁹ Therefore, *wh* cannot be checked and the relative head NP cannot be raised, so the derivation will crash. I conclude that although (73/74) is a relatively costly derivation, it is the only one that converges at the interface.

Let us turn to the examples in (66). In (66a) the raised constituent is *man met wiens vader* ‘man with whose father’. The derivation of this phrase is given in (75), where N_1 is *vader* and N_2 the relative head *man*, which is initially embedded as a possessive complement of N_1 . D_1 and P_2 are abstract; P_2 assigns genitive Case (see Sections 2.3 and 3.1). The possessive PP_2 is interpreted as a topic (a prenominal possessor) and moves to $SpecDP_1$ in (75b). As soon as P_1 *met* is Merged (75c), the formal features of D_{rel} are associated with this preposition. As a consequence, NP_2 moves to $SpecPP_1$ (75d).

- (75) a. $\bar{D}_1 [NP_1 N_1 [PP_2 P_2 [DP_{rel} D_{rel} NP_2]]] \rightarrow$
 b. $[DP_1 [PP_2 P_2 [DP_{rel} D_{rel} NP_2]]] \bar{D}_1 [NP_1 N_1 t_{pp2}]]$ \rightarrow
 c. $D_{rel,FF}+P_1 [DP_1 [PP_2 P_2 [DP_{rel} D_{rel,PF} NP_2]]] \bar{D}_1 [NP_1 N_1 t_{pp2}]]$ \rightarrow
 d. $[PP_1 NP_2 D_{rel,FF}+P_1 [DP_1 [PP_2 P_2 [DP_{rel} D_{rel,PF} t_{np2}]]] \bar{D}_1 [NP_1 N_1 t_{pp2}]]$
 man met wiens vader

D_{rel} ’s *wh*-feature is now at the highest level and the whole PP_1 is pied piped to $SpecCP$ of the relative clause, as required.

In (66b) the raised constituent is *man aan wie zijn vader*, lit. ‘man to who his father’. Here, P_2 is not genitive. The derivation is almost the same as in (75), but there is one additional step (between (75a) and (75b)): P_2 moves to D_1 ; this gives the possessive pronoun *zijn*. The complete structure is given in (76):

- (76) $[PP_1 NP_2 D_{rel,FF}+P_1 [DP_1 [PP_2 t_{p2} [DP_{rel} D_{rel,PF} t_{np2}]]] P_2+D_1 [NP_1 N_1 t_{pp2}]]$
 man aan wie zijn vader

Again, D_{rel} ’s *wh*-feature is associated to the highest head P_1 , and the whole PP_1 will be pied piped to $SpecCP$ of the relative clause.

If there is an additional level of complexity, as in (67/68), the last two steps of (75) can be postponed until the next prepositional projection becomes available, as we did in (73). This is shown in (77):

- (77) a. $[PP_1 P_1 [DP_1 D_{rel} NP_2 \dots\dots]]$ \rightarrow
 b. $P_3 [DP_3 D [NP_3 N [PP_1 P_1 [DP_1 D_{rel} NP_2 \dots\dots]]]]$ \rightarrow
 c. $[PP_3 NP_2 D_{rel,FF}+P_3 [DP_3 D [NP_3 N [PP_1 P_1 [DP_1 D_{rel,PF} t_{np2} \dots\dots\dots]]]]]]$
 man met de vader van wiens vrouw
 man met de vader van wie zijn vrouw

If the movement of $D_{rel,FF}$ is not procrastinated, the derivation will crash, as explained before.

As a final and perhaps most complicated example, consider (78), where we have recursive possession.⁴⁰ Interestingly, the pied piped constituent is a DP; the example contrasts with the sentences in (64), which are unacceptable.

³⁹ Neither can PP_2 be generated as an independent adverbial phrase, since an AdvP never modifies a component of another major constituent.

- (78) Ik ken de *man wiens zuster haar broer* jij gezien hebt.
I know the man whose sister her brother you seen have
 ‘I know the man whose sister’s brother you saw.’

The relevant difference is the high position of *wh* in (78). The derivation of the phrase in italics is given in (79), following the analysis described above:

- (79) a. \bar{P} [DP-rel D_{rel} [NP man]] →
 b. D_{rel,FF+} \bar{P} [DP-rel [D-rel,PF wiens] [NP man]] →
 c. [PP [NP *man*] D_{rel,FF+} \bar{P} [DP-rel [D-rel,PF wiens] t_{np}]] →
 d. \bar{D} [NP zuster [PP [NP man] D_{rel,FF+} \bar{P} [DP-rel [D-rel,PF wiens] t_{np}]]] →
 e. [DP [PP [NP *man*] D_{rel,FF+} \bar{P} [DP-rel [D-rel,PF wiens] t_{np}]]] \bar{D} [NP zuster t_{pp}] →
 f. D [NP broer [PP P [DP **man wiens zuster**]]] →
 g. P+D [NP broer [PP t_p [DP man wiens zuster]]] →
 h. [DP [PP t_p [DP *man wiens zuster*]] [P+D haar] [NP broer t_{pp}]]

In (79b) the relative pronoun is related to the abstract genitive P; in (79c) the ϕ -features of D_{rel} are checked in spec-head configuration after NP-movement; in (79d) the PP derived is inserted in a larger NP/DP; in (79e) there is DP-internal possessive topicalization; in (79f) the DP derived is inserted in a PP in a larger DP; in (79g) P moves to D in order to create a possessive pronoun; and in (79h) we have possessive topicalization in the largest DP. Is the complete phrase eligible for pied piping? The *wh*-feature is at the PP level in (79e). Since PP is in the specifier of D, the DP *man wiens zuster* can be pied piped. In (79h) this DP is embedded in a PP in the specifier of the largest DP. Therefore, the complete phrase is not pied pipable, as it stands. However, notice that the highest P is a trace, hence lexically empty. Therefore, we might as well assume that it is not PP that is topicalized in (79h), but DP (cf. footnote 30):

- (79) h.’ [DP [DP *man wiens zuster*] [P+D haar] [NP broer [PP t_p t_{dp}]]]

If this is correct, we predict pied piping of the highest DP indeed, since the *wh*-feature is now present in the minimal checking domain of C after movement to SpecCP.

Briefly summarized, I have introduced some new data concerning heavy pied piping in restrictive possessive relatives in Dutch. We have seen that an additional prepositional projection facilitates pied piping in general. Theoretically, I have claimed that pied piping is a possible consequence of (abstract) head movement. In relative clauses, raising of the relative head XP is a kind of *wh*-movement, caused by the *wh*-feature of the relative pronoun/operator D_{rel}. If D_{rel} is associated with a higher preposition for some reason, its *wh*-feature is also lifted to this higher level; therefore, *wh*-movement targets PP instead of DP_{rel}. Another possible configuration for heavy pied piping is created if a *wh*-constituent is overtly moved to the highest specifier in a large phrase, which is the situation in recursive possessive constructions; in this case the pied piped phrase can be a DP.

⁴⁰ Thanks to a reviewer for bringing up this type of example (in German). Instead of *wiens* we can also use *wie zijn* ‘who his’, as usual, with a slightly different derivation starting like (62) above. A German example is *der Mann dem seiner Schwester ihren Sohn ich getroffen habe*, lit. ‘the man who his sister her son I met have’.

4. Possessive relatives in English and German

The previous section discussed three types of possessive relative constructions in Dutch: the prepositional, the genitive and the possessive pronoun construction. The relevant examples in English and standard German are repeated in (80) and (81).

- (80) a. the man of whom I know the father
 b. the man whose father I know
 c. * the man who(m) his father I know
- (81) a. der Mann von dem ich den Vater kenne
 b. der Mann dessen Vater ich kenne
 c. * der Mann dem seinen Vater ich kenne

There is no reason to assume that the syntactic structure of the prepositional construction is different from the one discussed in Section 3.1 for Dutch; thus we have (82):

- (82) [DP D [CP [PP NP D_{rel,FF+P} [DP-rel D_{rel,PF} t_{np}]]] [DP D [NP N t_{pp}]]]
 the man of whom I know the father
 der Mann von dem ich den Vater kenne

Furthermore, the German genitive construction is derived as discussed in (59)-(61) above; this gives (83):

- (83) [DP D [CP [DP [PP NP D_{rel,FF+-P} [DP-rel [D_{rel,PF} D_{rel}] t_{np}]]] ~~D~~ [NP N t_{pp}]]_i t_i]
 der Mann dessen Vater ich kenne

Why is the possessive pronoun construction (81c) unacceptable in (standard) German? I do not think there is any syntactic reason for it. Note, however, that the genitive Case in general is fully productive in German; therefore, there is no need to use the more laborious possessive pronoun construction, apparently. In Dutch, however, there is no productive genitive Case, and *wiens* belongs to a formal register; this creates room for the more colloquial possessive pronoun construction. Furthermore, recall that (81c) is not impossible in all variants of German. In Section 1.1 we saw an example from Hessisch.

In English the situation is a little different. The reason is that *whose* is not the exact equivalent of Dutch/German *wiens/dessen*. The English pronoun *whose* is in fact an *s*-construction with a deviant spelling – i.e. *who's*; see also Corver (1990:171ff). A particularly telling example in this respect is *Who the hell's idea is this?* Recall from Section 2.3 that the English Saxon genitive is syntactically equivalent to the possessive pronoun construction. Thus, *whose* must be compared to *wie zijn* 'who his'. Therefore, it is in fact the genitive construction that is absent from English. The possessive pronoun construction is spelled out as *whose*; hence (80c) is blocked. The structure of (80b) is given in (84); compare the derivation in (62) and (63) above.

- (84) [DP D [CP [DP [PP NP t_p [DP-rel D_{rel,PF} t_{np}]]] D_{rel,FF+P+D} [NP N t_{pp}]]_i t_i]
 the man who- -se father I know

This concludes the discussion of normal possessive relatives in German and English. In the next section we will examine the influence of R-pronouns. Here, I would like to add a note on heavy pied piping.

In Section 3.2 it was shown that heavy pied piping in Dutch is acceptable, provided that the raised constituent is a prepositional phrase (with the exception of (78), where *wh* is overtly present in a high specifier). As expected, the same restriction applies in German; this is shown in (85) versus (86):

- (85) a. * Ich kenne den Mann, den Vater von dem du eingeladen hast, nicht.
 I know the man the father of who you invited have, not
 int. 'I don't know the man whose father you invited.'
- b. * Ich kenne den Mann, den Vater von dessen Frau du eingeladen hast, nicht.
 I know the man the father of whose wife you invited have, not
 int. 'I don't know the man the father of whose wife you invited.'
- (86) a. Ich kenne den Mann, an dessen Vater du gestern gedacht hast, nicht.
 I know the man of whose father you yesterday thought have, not
 'I don't know the man of whose father you thought yesterday.'
- b. Ich kenne den Mann, an den Vater von dem du gestern gedacht hast, nicht.
 I know the man of the father of who you yesterday thought have, not
 'I don't know the man of whose father you thought yesterday.'
- c. ? Ich kenne den Mann, an den Vater von dessen Frau du gestern gedacht hast.
 I know the man of the father of whose wife you yesterday thought have
 'I know the man of the father of whose wife you thought yesterday.'

Although very heavy pied piping as in (86c) is not perfect for all speakers, there is a clear contrast with (85b). I conclude that the analysis of this phenomenon suggested in Section 3.2 can be carried over to German.⁴¹

At least for some speakers the pattern is confirmed in English restrictive relative clauses as well. (Recall from Section 1.5 that the situation is different in appositive relatives. See also the discussion in Section 1.4.) Fabb (1990:64) gives the following examples of unacceptable sentences:

- (87) a. * The man the mother of whom I met yesterday is a French speaker.
 b. * The men some of whom I like arrived yesterday.
 c. * Few windows here the curtains on which I really dislike let in enough light.

In each case the pied piped phrase is a DP. On the other hand, acceptable sentences in which the pied piped phrase is a PP are not difficult to find:

- (88) a. I need a book on the cover of which no one has written.
 b. Find the year at the beginning of which the deposit had been doubled.

⁴¹ I should note that one reviewer does not accept (86b/c), contrary to my informants.

- c. ... so-called start-slots, i.e., slots at the beginning of which a new packet can enter the server.
- d. I invited the man to the mother of whose wife you were introduced yesterday.

Thus, it seems that the pattern discovered in Dutch is a more general characteristic of Germanic.

5. Pied piping, preposition stranding and R-pronouns

So far we have ignored preposition stranding. As is well-known, there is a relation between P-stranding/pied piping and 'R-pronouns' in Germanic. This section discusses this phenomenon from the perspective of relative clauses.

First, consider the regular patterns of simple pied piping and preposition stranding. For more data see also Smits (1988). From (89/90) it seems that pied piping is obligatory in Dutch and German, contrary to the situation in English.

- (89) a. the man *about whom* we spoke
- b. de man *over wie* we spraken
- c. der Mann *über den* wir sprachen
- (90) a. the man *whom* we spoke *about*
- b. * de man *wie* we *over* spraken
- c. * der Mann *den* wir *über* sprachen

Examples with non-human antecedents appear to be impossible in either way in Dutch:

- (91) a. the source *from which* he drew
- b. * de bron *uit wat* hij putte
- c. die Quelle *aus der* er schöpfte
- (92) a. the source *which* he drew *from*
- b. * de bron *wat* hij *uit* putte
- c. * die Quelle *der* er *aus* schöpfte

However, compare (93a/b) to (91b) and (92b):

- (93) a. de bron *waaruit* hij putte
 the source wherefrom he drew
 'the source from which he drew'
- b. de bron *waar* hij *uit* putte
 the source where he from drew
 'the source which he drew from'

Here we see the emergence of R-pronouns (*er* 'there', *daar* 'there', *waar* 'where', *hier* 'here', *ergens* 'somewhere', *nergens* 'nowhere', *overal* 'everywhere'). These are pronouns that are spelled out in a locative form. For some reason, several pronouns that

are selected by a preposition are transformed into an R-pronoun. This process goes along with a reversed order of the preposition and the pronoun. According to Van Riemsdijk (1978) this indicates movement to SpecPP. Hence we have e.g. *van dat* → *ervan* ‘of that → thereof’, *om wat* → *waarom* ‘around what → wherearound = why’, *uit welke* → *waaruit* ‘from what → wherefrom’. In some cases the preposition changes as well, e.g. *met iets* → *ergens mee* ‘with₁ something → somewhere with₂’.

This transformation is reserved for non-human pronouns, so *van wie* → **wievan* ‘of who(m) → *who-of’ is impossible, because a human pronoun cannot be replaced by a non-human locative pronoun. In colloquial Dutch the human/non-human distinction can be neglected optionally; this gives *van wie* → *waarvan* ‘of who(m) → whereof’. The Dutch and German examples above indicate that the possibility of preposition stranding is dependent on the R-transformation. Consequently, preposition stranding in a relative clause with a human antecedent is not possible, unless a colloquial variant as in (94b) is chosen.⁴²

- (94) a. * *de man wie hij over sprak*
 the man who he about spoke
 int. ‘the man whom he spoke about’
 b. *de man waar hij over sprak*
 the man where he about spoke
 ‘the man man who he spoke about’

In English matters are different – compare (90a) and (92a) to (94a/b) – see further below.

In German there is no obligatory R-transformation; hence (91c) is possible, contrary to (91b) in Dutch. Notice also that most locative pronouns lack an /r/: *wo* ‘where’, *da* ‘there’. Nevertheless, outside relative contexts the R-transformation is often used in (colloquial) German, e.g. *wovon* ‘whereof’, *daraus* ‘thereoutside’, *hierauf* ‘hereon’, *worüber* ‘whereabout’.⁴³ Some speakers accept preposition stranding based on this, e.g. *Da habe ich nicht mit gerechnet*, lit. ‘there have I not on counted’; *Wo wolltest du noch drüber reden?* lit. ‘where wanted you yet about (to) talk’.⁴⁴

The differences in judgments can be analyzed as follows. Some speakers allow for the regular R-transformation as described for Dutch. Following Van Riemsdijk (1978), I assume that it indicates movement of DP to SpecPP, which feeds P-stranding. This is the liberal variant. On the other hand, the R-transformation – and hence P-stranding – is categorically disallowed in formal German. There is also an intermediate variant, which

⁴² A left-peripheral definite and/or relative R-pronoun may refer to a person in Dutch. However, in other positions or in questions this is not possible in the standard language. Hence we have the following pattern for [+human] reference, where in each case reference to a [-human] is acceptable:

(i) *	Hij heeft <i>daarmee/ermee</i> gespeeld.	[he has therewith played]	<i>demonstrative</i>
(ii) *	<i>Waar</i> heeft hij mee gespeeld?	[where has he with played?]	<i>interrogative</i>
(iii)	<i>Daar</i> heb ik mee gespeeld.	[there have I with played]	<i>topicalized</i>
(iv)	Het meisje, <i>daar</i> heb ik mee gespeeld.	[the girl, there have I with played]	<i>l-dislocated</i>
(v)	Het meisje <i>waar</i> ik mee heb gespeeld.	[the girl where I with have played]	<i>relative</i>

It is not clear what causes these differences.

⁴³ Notice the epenthesis of an /r/ if there is no intrinsic *r* in the pronoun (e.g. *wo*, *da*) and the preposition starts with a vowel (e.g. *aus*, *über*).

⁴⁴ The *d* in *drüber* seems to indicate a reduced lexical copy of the moved pronoun. The issue of ‘trace lexicalization’ in German is beyond the scope of this article.

has R-transformations, but no P-stranding. I submit that this variant involves overt head movement of the pronoun to the preposition, which gives the effect of an R-transformation, but not the stranding possibility since excorporation is generally impossible.⁴⁵ This option is also available in Dutch; see further below.

At least for some speakers of the liberal variant of German, we expect P-stranding to be allowed in relative contexts as well. This is indeed the case; some examples are given in (95):

- (95) a. das Buch wo wir noch drüber reden wollten
the book where we yet about (to) talk wanted
 ‘the book which we wanted to talk about’
 b. die Quelle wo er draus schöpfte
the source where he from drew
 ‘the source where he drew from’
 c. das Geschäft wo wir den Inhaber (da) von kennen
the shop where we the owner (there) of know
 ‘the shop which we know the owner of’

Nevertheless, the variant exemplified by (89c) is the neutral option.⁴⁶

Let us turn to the syntactic derivation in more detail. Recall from Sections 3/4 that the regular structure of the relevant PP is (96):

- (96) [PP NP D_{rel,FF}+P [DP_{rel} D_{rel,PF} t_{np}]]
 man over wie
 man about whom
 Mann über den
 source from which
 Quelle aus der

Since the *wh*-feature resides at the P level, the whole PP will be pied piped to SpecCP, as in (89) and (91a/c). Furthermore, NP plus D_{rel} (e.g. *man wie*) cannot move alone because it is not a constituent; cf. (90b/c).

If a relative pronoun is turned into an R-pronoun, the linear order between the preposition and the relative pronoun is reversed. As stated, there are two ways to accomplish this: movement of DP_{rel} to SpecPP or head movement of D_{rel} to P. The first option gives (97):⁴⁷

- (97) [PP [DP_{rel} NP D_{rel} t_{np}] P t_{dp-rel}]
 bron waar- -uit

⁴⁵ A similar type of analysis (which involves two options, namely head movement or movement to SpecPP) is proposed in Lutz & Trissler (1992).

⁴⁶ An additional complication is the fact that *wo* is used as a relative particle in various dialects (compare *that* in English). Thus the following examples in Swiss German (Henk van Riemsdijk, p.c.) are actually instances of a resumptive strategy, i.e. *wo* is not a raised pronoun but a complementizer:

(i) de maa, wo mer über en gredt händ [the man that we about him talked have]

(ii) d frau, wo mer nüüt vo - n - ere wüssed [the woman that we nothing of her know]

⁴⁷ Recall that for convergence in a relative context, NP overtly moves to SpecDP_{rel} for ϕ -feature checking (instead of covert checking) – see the discussion in footnote 17 in Section 2.2.

In this case the *wh*-feature is within DP_{rel} . SpecPP can serve as an escape hatch for movement of DP_{rel} out of the PP. Thus, P can be stranded; this gives (98) = (93b), for instance.⁴⁸

(98) de [_{CP} [_{DP_{rel}} bron waar]_i ... hij [_{PP} t_i uit t_i] putte]

An example with a possessive PP is (99) = (95c):

(99) das [_{CP} [_{DP_{rel}} Geschäft wo] ... wir [_{DP} den Inhaber [_{PP} t_i von t_i]] kennen]

The second option (D-to-P) gives the structure in (100):

(100) [_{PP} NP [D_{rel}+P t_{np}]]
bron waar-uit

The order of the preposition and the pronoun is reversed, and we have an R-transformation. Since NP and D_{rel} do not form a constituent, the preposition cannot be stranded. The *wh*-feature resides at the P level, which leads to pied piping of the PP; see (101) = (93a):

(101) de [_{CP} [_{PP} bron waaruit] ... hij t_{pp} putte]

An example with a possessive PP in German is (102):

(102) das [_{CP} [_{PP} Geschäft wovon] ... wir [_{DP} den Inhaber t_{pp}] kennen]

Thus we can derive the patterns found in Dutch and German, and some of those in English.

The examples that remain to be discussed are (90a/92a): preposition stranding in English. The difference with Dutch and German is that English does not show the R-transformation overtly. We may simply assume that English allows for movement of DP_{rel} to SpecPP without lexically encoding it as an R-transformation. Thus (92a) is structured as follows:

(103) D [_{CP} [_{DP_{rel}} NP D_{rel} t_{np}]_i [_{PP} t_i P t_i]]
the source which he drew from

The relative DP escapes from PP via SpecPP. The *wh*-feature remains within DP_{rel} , therefore, DP_{rel} moves on to SpecCP, stranding P.

To conclude, throughout this article we have assumed that if a relative pronoun is embedded in a PP, it establishes a relation with the preposition in case. In Dutch this is reflected by the *w*-morphology of the pronoun. In the syntactic model that we use, there are three ways of creating a checking configuration between X and Y, namely if XP is moved to SpecYP, if X moves to Y overtly, or if the formal features of X move to Y. In Section 3 the third possibility was exploited; in the present section we saw that the first two options are available as well in the context of R-transformations. The results are

⁴⁸ A reviewer notes that pied piping of the PP in (97) may also be possible, since *wh* is present in the specifier of the larger phrase. This seems to be correct.

summarized in Table 1, where inversion of the order between P and D_{rel} is indicated apart from the lexical R-change.

Table 1. Preposition stranding, pied piping and R-pronouns in English, Dutch and German.

movement	English	Dutch	German		consequences		
			liberal	formal			
D _{rel,FF} → P	+	+	+	+	no inversion	no R	pied piping
DP _{rel} → SpecPP	+	+	+	–	inversion	no R	P-stranding
D _{rel} → P	–	+	+	–	inversion	R	pied piping

(*) non-human mostly

Finally, I would like to add a note on heavy pied piping. In Section 3.2 I have analyzed it as the consequence of the association of D_{rel}'s formal features – including *wh* – to a high(er) preposition. Therefore, the raised constituent cannot normally be a complex DP. This is correct for constructions in which there is an R-transformation as well; see (104) in Dutch:

- (104) * Ik ken de winkel de eigenaar waarvan je hebt uitgenodigd, niet.
I know the shop the owner whereof you have invited, not.
 int. 'I don't know the shop whose owner you invited.'

In fact, we predict that heavy pied piping is unacceptable if the raised constituent is a PP as well. Namely, the R-transformation indicates that D_{rel} is already associated with the lower preposition. Therefore, it cannot be associated with the higher preposition; hence pied piping is impossible. This is borne out; see (105):⁴⁹

- (105) ?* Ik ken de winkel met de eigenaar waarvan je gisteren hebt gesproken.
I know the shop with the owner whereof you yesterday have spoken
 int. 'I know the shop to whose owner you spoke yesterday.'

Also consider the minimal pair in (106):

- (106) a. Ik ken de man met de vader van wie je gisteren gesproken hebt.
I know the man with the father of whom you yesterday spoken have
 'I know the man to the father of whom you spoke yesterday'
 b. * Ik ken de man met de vader waarvan je gisteren gesproken hebt.
I know the man with the father whereof you yesterday spoken have
 int. 'I know the man to the father of whom you spoke yesterday'

Here I use the fact that a relative R-pronoun can refer to a human antecedent in colloquial speech, as illustrated in (94b) above. Nevertheless, (106b) is unacceptable, which confirms the point made.

⁴⁹ A reviewer wonders if a sentence as in (105) could be derived starting from a structure like (97), where the R-transformation is the result of DP_{rel} in SpecPP, and embedding it in a larger PP-DP-NP. This is not the case. Even if the formal features of D_{rel} would be able to associate to the highest P, the head NP cannot be moved up any further, since the ϕ -features of D_{rel} are already checked. Consequently, the determiner of the main clause will cause the derivation to crash. (Note, furthermore, that if ϕ -feature checking is postponed, NP cannot be moved to SpecDP_{rel}, and the R-transformation fails immediately, as in $*[_{PP}[_{DP-rel} waar eigenaar]_i van t_i]$.)

6. Conclusion

We have examined the phenomenon of pied piping in restrictive relative clauses in the Germanic languages Dutch, German and English. In many instances these are possessive relatives. Therefore, the syntactic analyses of relativization and attributive possession must be integrated. I have made use of the so-called promotion analysis of relative constructions, which claims that the head noun originates within the relative clause, in combination with the relative pronoun or operator. This theory finds its motivation in connectivity effects and typological patterns; furthermore, I have couched it in a detailed system of movement and feature checking. However, it seems that the analysis for pied piping and possessive constructions can also be transferred to a right-adjunction theory of relative clauses. As for attributive possession, I have argued that the three main types of possessive constructions – the periphrastic (i.e. lexical prepositional) one, the morphological genitive, and the possessive pronoun construction – are syntactically related. In each case the possessor is generated as a PP complement of the head noun. Thus, the generalization that only verbs and prepositions, i.e. [-N] categories (or their extended projections), license Case can be maintained; functional projections between DP and NP are not necessary for our purposes.

Possessive relatives reflect the basic types of attributive possession, so there are at least three types of possessive relatives in Germanic. Dutch has all of these possibilities. Standard German lacks the possessive pronoun construction. English *whose* is analyzed as an instance of the English Saxon genitive; therefore, it has the syntactic structure of the Dutch possessive pronoun construction, i.e. *who's* ('*who his*'). Furthermore, I have argued that there is a syntactic relation between the relative pronoun/operator and the possessive P. In Dutch this is lexically shown by the obligatory *w*-form of the relative pronoun if it is embedded in a PP. The interplay between the theory established for attributive possessive structures and the theory of relative clauses then derives the grammatical patterns discussed without further stipulations. Concerning heavy pied piping, I have shown that it depends on the presence of an additional (lexical) prepositional phrase (unless *wh* is already overtly present in a high specifier position). This surprising pattern is explained by the requirement that the formal features of the relative D (including *wh*) are moved to the highest level, and the possibility of relating the relative D with a preposition. In general, pied piping is claimed to be a possible consequence of overt or covert head movement.

Finally, we have discussed the effect of the so-called R-transformation on pied piping and preposition stranding in relative clauses. The different possibilities shown by English, Dutch and German are argued to be consequences of the theoretical options of creating a syntactic relation (*in casu* between D and P), namely by means of XP movement, overt head movement, or covert movement.

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