Dear members of the LeibnizDream selection committee,

I write this letter to express my interest in a post-doctoral position within the LeibnizDream project. My name is Fenna Bergsma, and I am a morphologist in the final stages of my PhD within the Research Training Group 'Nominal Modification' in Frankfurt. In this letter I, first, explain what drives me as a linguist. Second, I elaborate on my experience as a researcher. Third, I discuss the contributions I vision for myself within the project.

When I started studying linguistics I wanted to learn how language works in our brains. Within a few years I realized that we know very little about the brain, especially the higher cognitive functions, and I turned to theoretical linguistics. My aim was to contribute to developing a theory of human language. At the same time, neurologists could determine how our brains work. Some day, the brain model could then be mapped onto our language theory. So, what I want to do today is to contribute to this theory of language. Whatever this theory of language is, it is not necessarily supposed to do what the brain does, but it should be a good enough theory within itself. For instance, cross-linguistic differences should be found in a single place, and not in different parts of the model. Therefore, language-specific rules and construction-specific analysis should not exist. The theory that I work in that does that is nanosyntax. Everything except for one variable is kept constant across languages. The functional sequence and feature inventory is the same for all languages, and the spellout algorithm is the same. The only difference between languages is the post-syntactic lexicon. This lexicon consists of syntactic trees that are connected to a phonological and a semantic exponent, which can be mapped onto syntactic structures. This means that the work consists of carefully investigating data, finding out which meaning is expressed by a single morpheme, and comparing this across languages. Looking at child language in which there is a more one-to-one match between language and thought fits very well within that picture.

For my dissertation I am working the well-studied phenomenon of case attraction in Germanic headless relatives. I address two main points. First, a language such as Gothic allows for case requirements from the main and relative clause to differ. The only restriction is that the relative pronoun appears in the most complex required case, following the scale NOM < ACC < DAT. I derive that by following work that has established that case is morphologically complex: [DAT[ACC[NOM]]]. I analyze the case attraction phenomena as a result of properties of morphology. Furthermore, I follow the general assumption that ellipsis takes place under identity targets phrases. What follows is that [DAT[ACC[NOM]]] elides [ACC[NOM]], providing the surface phenomenon that the most complex case surfaces. The second point I address concerns the cross-linguistic differences that are found. Gothic allows for case attraction in both directions: the case required in the main clause can win over the case required in the relative clause, but also the other way around. Old High German and Modern German do not, they only allow one of the two directions (Old High German only lets the main clause case surface, and German only the relative clause one). I am working out a proposal in which this is a reflex from the language's morphology (again). The relevant correlate in morphology is the shape of the 'base' or the relative pronoun: Old High German uses a D-element, Modern German uses a WH-element and Gothic uses a D-element plus an independent complementizer. My main

goal in the dissertation is to argue that case attraction in headless relatives is not a special property of a small set of languages. Instead, its existence is expected to appear because of how language is organized.

In another recent project I have been working on the R-pronoun and postposition *waar-mee* 'with what' in Dutch. I argue that this form surfaces when all relevant features form a proper constituent. When this requirement is not met, *met wat* 'with what' appears, realizing the same set of features as *waar-mee* 'with what'. This alternation is analyzed as result of regular spell-out mechanisms in nanosyntax. A finer decomposition offers an account for three observations: R-pronouns are syncretic with locatives, R-pronouns combine with postpositions and regular pronouns with prepositions, and the instrumental preposition differs phonologically from the instrumental postposition (*met vs. mee*). I am working on also incorporating verbal particles (that pattern in form with postpositions, even though the precede the verb), and extending it to other adpositions in Dutch. The next step is to compare these to German and Frisian.

Another topic I have been working on (in collaboration with Dr. Jan Don from the University of Amsterdam) is gender in Dutch. We start from the observation that Dutch has some nouns that refer to masses if they combine with the neuter gender determiner, and they refer to counts if they combine with the common gender determiner. Another observation is that the diminutive suffix makes all mass nouns countable, and that the noun plus diminutive always combines with the neuter gendered determiner. At the same time, we also have to allow for randomness: neuter gendered nouns can be mass or count, and common gendered nouns can be mass or count too. We propose an account in which the nouns differ in how they are stored in different sizes in the lexicon, meaning that they spell out more or less features. Combining them with the features that can be realized by the diminutive suffix and the different determiners derives the properties of the noun.

In my years in Groningen and Amsterdam I have gained some experience working experimentally and on acquisition. In one research project, I examined whether the constraint to eventive verbs in root infinitives of children acquiring their first language might be a result of a lack of epistemic modality. I investigated Dutch root infinitives in second language acquisition from CHILDES using CLAN. For my bachelor thesis I designed and set up an experiment. I transcribed the 1,000 most frequent words in Frisian and their translations into Dutch to find the most frequent phonological correspondences between Dutch and Frisian. I developed an intervention to teach the phonological correspondences and two intelligibility tests (one on text and one on word level) as pre- and posttest. I taught the phonological correspondences to Dutch school children. It did not improve the intelligibility of Frisian, but their attitude towards Frisian became more positive. The thesis was a part of a research project on Mutual intelligibility of closely related languages.

Within the LeibnizDream project I can see my main contributions in developing the morphological theory, which is built on semantic primitives, and translating this to testable hypotheses. What speaks to me about this project is that it aims to develop a system from beginning to

end, incorporating all disciplines. In each step of the process, there are experts with a different background and a different main focus. That way, nothing can get lost between the interfaces. Within our Research Training Group I have some experience with being part of group that works in different disciplines but on the same topic. The regular interactions that I have here make me spell out my own ideas and assumptions in more detail, and help me find problems. On the other hand, work from others helps me get a better insight about approaches from different perspectives. In Frankfurt we all have our own dissertations to finish. My hope for the LeibnizDream project is that collaborations will be even more intense, and with that the positive effects of them as well.

Currently I am writing up my dissertation, which I will hand in before October 12. That means that January 1 would be good time for me to start a new project.

Sincerely,
Fenna Bergsma

In the remainder of this document, please find:

- My curriculum vitae including a complete list of publications
- Copies of three representative writings:
  - The R-pronoun and postposition *waar-mee* in Dutch (a recent article I wrote)
  - A recurring pattern (a chapter from my dissertation)
  - Mismatches in free relatives - grafting nanosyntactic trees (an article I published in Glossa last year)

Fenna Bergsma

Personal

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Education

10/2017-09/2020	PhD Linguistics, Goethe-Universität, Frankfurt Research Training Group on Nominal Modification Preliminary dissertation title: *Case competition in headless relatives*
09/2019, 02/2019-04/2019	research stay at Masarykova univerzita, Brno
03/2018-05/2018	research stay at University of Pennsylvania, Philadelphia
08/2018	EGG summer school 2018, University of Banja Luka
08/2017	EGG summer school 2017, Univerzita Palackého v Olomouci
09/2013-08/2015	Research Master Linguistics, Universiteit van Amsterdam Thesis: *To serve double duty under syncretism - How Nanosyntax and grafting account for the free relative construction*
09/2010-08/2013	Bachelor Linguistics, Rijksuniversiteit Groningen - *cum laude* Thesis: *Does Knowledge about Phonological Correspondences Contribute to the Intelligibility of a Related Language? A Study with Speakers of Dutch Learning Frisian.*
09/2010-08/2013	Honours College program (25% extra credits)

Publications

under review — Bergsma, Fenna. The R-pronoun and postposition *waar-mee* in Dutch In: E. Anagnostopoulou and C. Sevdali. *On the place of case in grammar.*

2019 — Bergsma, Fenna. Mismatches in free relatives - grafting nanosyntactic trees. *Glossa: A Journal of General Linguistics* 4(1), 119. DOI: http://doi.org/10.5334/gjgl.821

2019 — Bergsma, Fenna. The Role of Prepositions in Case Mismatches in Free Relatives. In: A. Creemers and C. Richter. *University of Pennsylvania Working Papers in Linguistics 25.1.* 41-50.

2014 — Bergsma, Fenna, Femke Swarte and Charlotte Gooskens. Does Instruction about Phonological Correspondences Contribute to the Intelligibility of a Related Language? A Study with Speakers of Dutch Learning Frisian. *Dutch Journal of Applied Linguistics, 3*(1), 45-61. DOI: https://doi.org/10.1075/dujal.3.1.03ber

Talks

Invited talks

2018 — "*Waarmee* and *met wat* in Dutch free relatives", *Oberseminar English Linguistics (Syntax-Semantics)*, Georg-August-Universität Göttingen, October 30.

2018 — "Grafting nanosyntactic trees: an analysis of case mismatches in free relatives", *Kolloquium Topics in syntax and its interfaces*, Universität Leipzig, June 26.

Conference talks (peer-reviewed)

2019 — "Gender: a Matter of Size – On Individuation, Mass, and Diminutives in Dutch", *SinFonIJA 12*, Masarykova univerzita, September 12 - 14. With Jan Don

2019 — "Verum focus in Frisian", poster at *GLOW 42*, Universitetet i Oslo, May 7-11.

2019 — "PPs and DPs in non-matching free relatives", *Exploring Nanosyntax, LSA annual meeting*, New York, January 3-6.

2018 — "PPs and DPs in free relatives: *waarmee* and *met wat* in Dutch", *On the place of case in grammar (PlaCiG)*, Rethymnon, October 18-20.

2018 — "Case mismatches in free relative constructions", *CGG 28*, Universitat Rovira i Virgili, May 30-June 1.

2018 — "Mismatches in free relatives", *GLOW 41*, Research Institute for Linguistics of the Hungarian Academy of Sciences, April 10-14.

2018 — "The power of syncretisms: how syncretisms can serve double duty", *Penn Linguistics Conference 42*, University of Pennsylvania, March 23-25.

2018 — "Syncretism = shared syntax + shared spellout" *ConSOLE XXVI*, University College London, February 14-16.

2016 "To serve double duty under syncretism" *ConSOLE XXIV*, University of York and York St John University, January 6-8. With Jan Don

2015 "To serve double duty under syncretism" *Morphologydays 2015*, Katholieke Universiteit Leuven, December 17-18. With Jan Don

2013 "Does Knowledge About Linguistic Differences Contribute to Receptive Multilingualism? - A Pilot Study with Speakers of Dutch Learning Frisian" *ExAPP 2013: Experimental Approaches to Perception and Production of Language Variation*, Københavns Universitet, March 20.

Other talks (non peer-reviewed)

2019 "Towards deriving a typology of case mismatches in free relatives", *Colloquium Graduiertenkolleg Nominal Modification*, October 22.

2018 "Mismatches in free relatives - grafting nanosyntactic trees", *Nanosyntax Weblab*, online, November 30.

2018 "On the distribution of *waarmee* and *met wat* in Dutch free relatives", *Colloquium Graduiertenkolleg Nominal Modification*, Goethe-Universität Frankfurt, October 16.

2018 "Mismatches in free relatives", *GK Nominal Modification 2018 Summer Retreat*, Fulda, May 25-26.

2017 "Syncretism = shared syntax + shared spellout" *Colloquium Graduiertenkolleg Nominal Modification*, Goethe-Universität Frankfurt, December 5.

2015 "(De) Mij(n(e(s))) - Complex Possessives in Dutch" *Taalkunde in Nederlanddag 2015*, Universiteit Utrecht, February 7. Presented by Yvonne van Baal and Fenna Bergsma

With Yvonne van Baal and Jan Don

2013 "How does reality influence performance on false belief tasks?" *34th TABU Dag 2013*, Rijksuniversiteit Groningen, June 14. Presented by Jidde Jacobi and Maike Tromp. With Jidde Jacobi, Maike Tromp, Maret Hans and Bart Hollebrandse

2013 "Does Knowledge About Linguistic Differences Contribute to Receptive Multilingualism? - A Pilot Study with Speakers of Dutch Learning Frisian" *Anéla/Viot Juniorendag 2013*, Rijksuniversiteit Groningen, March 3.

2012 "Interventiemethoden voor receptieve meertaligheid - Een case study met Nederlanders die Fries leren verstaan." *Dei fan de Fryske Taalkunde 2012*, Fryske Akademy, December 14.

Teaching experience

04/2019-07/2019 *DP Morphology*, MA Seminar, Summer term.

Goethe-Universität, Frankfurt

02/2012-04/2012 Teaching assistant SPSS Statistics practical

Rijksuniversiteit Groningen

Organization

2019	Co-organizer, Workshop on formal and experimental approaches to adjectival modification, January 31- February 1, Goethe-Universität, Frankfurt
2019	Co-organizer, 45th conference Generative Grammar in the South, July 19-21, Goethe-Universität, Frankfurt

Relevant non-academic work experience

09/2015-09/2016, 03/2017-10/2017	Project manager at Stichting Praktijkleren, Amersfoort
09/2006-09/2015	Developer of teaching materials at Stichting Praktijkleren, Amersfoort

Languages

native:	West Frisian, Dutch
fluent:	English
good command:	German

The R-pronoun and postposition *waar-mee* in Dutch

Fenna Bergsma
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January 16, 2020

1 Introduction

Dutch has the preposition *met* 'with' that expresses the instrumental. In (1a), *met* 'with' is combined with a full DP. The inanimate pronoun in Dutch is *'t* 'it'.[1] (1b) illustrates that *'t* 'it' can be used as the object of a verb.

(1) a. Ik schilder met een kwast.
I paint with a brush
'I am painting with a brush.'
b. Ik zie 't.
I see it
'I see it.'

Met 'with' and *'t* 'it' do not appear together, as illustrated in (2a). Instead, Dutch uses the R-pronoun *'r* 'there' and the postposition *mee* 'with', as shown in (2b).[2,3]

(2) a. *Ik schilder met 't.
I paint with it
'I am painting with it.'
b. Ik schilder 'r -mee.
I paint there -with
'I am painting with it.'

R-pronouns (van Riemsdijk, 1978; Koopman, 1994) are nominal elements that are syncretic with locative pronouns, which in Dutch means they contain the morpheme *r*. The adpositions they combine with obligatorily follow the R-pronoun, see (2b) and (3). Notice also that the preposition *met* 'with' differs phonologically from the postposition *mee* 'with' (see (1a) and (2b)).

[1] The longer form that is mostly used in writing is *het* 'it'. I will use the spoken variant *'t* throughout this paper.

[2] The R-pronoun *'r* in (2b) can be written as *er*, *der* and *'r* and pronounced as respectively /ɛr/, /dər/ or /ər/. As far as I am aware, there is no clear meaning difference between these forms. See Wesseling (2018) for discussion. In my examples I use *'r*, but the other two forms fit just as well.

[3] In this paper I do not make any claims about the distinction between prefixes and prepositions, or suffixes and postpositions.

(3) *Ik schilder mee 'r.
I paint with there
'I am painting with it.'

The main question I address in this paper is how to correctly rule out *met 't* 'with it' in (2a), and let the R-pronoun and postposition in (2b) appear. I argue that R-pronouns are not something special, but a consequence of regular spellout mechanisms. Just like van Riemsdijk (1978) I analyze an R-pronoun and postposition as a type of allomorph of the preposition and pronoun. The crucial difference in the current approach is that spellout rules out the ungrammaticality of the preposition and pronoun and not the stipulation of a filter.

This paper is focuses on the instrumental R-pronoun and postposition *'r-mee* 'with it' and *waar-mee* 'with what' in Dutch. This instance is interesting for two reasons. First, just like for all R-pronouns, the R-pronoun is syncretic with the locative. In many of the R-pronouns and postpositions, the meaning component of the locative is intuitive, as many prepositions express locations, directions etc. However, an instrumental expresses an instrument, which does not have a meaning component associated with location. Ideally, an analysis treats the syncretism not as accidental but allows for the locative meaning to be absent. The second reason why I focus on this particular R-pronoun and postposition has to do with the form of the adposition. The preposition *met* 'with' does not only turn into a postposition, but it also changes into *-mee* 'with' when it is combined with an R-pronoun. This last observation has so far remained unexplained.

The main generalization is that the instrumental R-pronoun and postposition *waar-mee* 'with what' takes precedence over the instrumental preposition and inanimate pronoun *met wat* 'with what'. This generalization is subject to an important condition: the instrumental object needs to form a proper constituent i.e. a constituent to the exclusion of other features. When this condition is not met, the preposition and pronoun appear. This can straightforwardly follow in a system in which spellout targets phrasal constituents: Nanosyntax (Starke, 2009). I work this idea out capturing the following observations. First, R-pronouns are syncretic with locatives. Second, regular pronouns appear with prepositions, R-pronouns with postpositions. Third, the instrumental preposition and postposition differ in form (*met* vs. *mee*).

This paper is structured as follows. In Section 2 I discuss the condition that R-pronouns and postpositions are subject too: they need to form a proper constituent. I show that R-pronouns and postpositions and prepositions and pronouns are in complementary distribution, depending on whether all features form a proper constituent or not. In Section 3 I decompose *waar-mee* 'with what' and *met wat* 'with what', and I connect them to parts of syntactic structure. Section 4 shows in a derivation how *waar-mee* 'with what' is derived and the role that constituency plays. Section 5 concludes and discusses possible extensions of the analysis. All examples in this paper are from Dutch, unless indicated otherwise. Unmarked examples are constructed and have been verified by native speakers.

2 R-pronouns are proper constituents

The goal of this section is to show that R-pronouns and postpositions appear when all relevant features form a proper constituent, i.e. that all features form a constituent to the exclusion of any other features. I start the section by showing that *'rmee* 'with it' and *waar-mee* 'with what' are

the default, that normally they appear instead of *met 't* 'with it' and *met wat* 'with what'. Then I show an exception, in which *met wat* 'with what' has to be used and *waar-mee* 'with what' cannot. I argue that the crucial difference between the exception and other cases is that in the exception the relevant features do not form a proper constituent.

2.1 R-pronouns as default

In what follows I discuss the distribution of R-pronouns and regular pronouns in general (van Riemsdijk, 1978; Koopman, 1994). I start with the personal pronouns and then return to the wh-pronouns.

Dutch has the accusative personal pronouns *haar* 'her', *hem* 'him' and *'t* 'it' that can be used as animate and inanimate objects of verbs, as illustrated in (4).

(4) a. Ik zie haar/hem.
I see her/him
'I see her/him.'
b. Ik zie 't.
I see it
'I see it.'

Example (5a) shows that for animate objects the same pronouns (*haar* 'her' and *hem* 'him') appear as objects of prepositions. Repeating from the introduction, the inanimate personal pronoun *'t* 'it' cannot be used as an object of a preposition, shown in (5b). Instead, an R-pronoun appears. This is illustrated in (5c). (5d) shows that the R-pronoun has moved obligatorily to the left of the adposition.

(5) a. Ik schilder samen met haar/hem.
I paint together with her/him
'I am painting together with her/him.'
b. *Ik schilder met 't.
I paint with it
'I am painting with it.'
c. Ik schilder 'r -mee.
I paint there -with
'I am painting with it.'
d. *Ik schilder mee 'r.
I paint with there
'I am painting with it.'

Met is not the only preposition with which this happens. For example, *op* 'on' and *in* 'in' also do not combine with the inanimate personal pronoun *'t*, but the R-pronoun and postposition are used obligatorily.

(6) a. Ik zit 'r op.
I sit there on
'I am sitting on it.

b. *Ik zit op ’t.
I sit on it
‘I am sitting on it.

(7) a. Hij zwemt ’r in.
he swims it-in
‘He is swimming there it.’
b. *Hij zwemt in ’t.
he swims in it
‘He is swimming in it.’

The situation of the inanimate wh-pronouns resembles the one of the inanimate personal pronouns. *Wat* ‘what’ can function as an object of a verb (see (8a)), but not as an object of a preposition (8b). In that case, the R-pronoun and postposition *waar-mee* ‘with what’ appears, as shown in (8c).[4]

(8) a. Wat zie jij?
what see you
‘What do you see?’
b. *Met wat schilder jij?
with what paint you
‘What are you painting with?’
c. Waar -mee schilder jij?
where with paint you with
‘What are you painting with?’

Waar-mee ‘with what’ and not *met wat* ‘with what’ does not only appear in wh-questions, but also in other contexts. (9) gives an example of a headed relative, and (10) shows a free relative in which both predicates combine with an instrumental object. The use of *met wat* ‘with what’ is ungrammatical in both contexts, and *waar-mee* ‘with what’ is used.

(9) a. Ik schilder met de kwast waar -mee jij ook schildert.
I paint with the brush where with you also paint
‘I am painting with the brush that you are painting with too.’
b. *Ik schilder met de kwast met wat jij ook schildert.
I paint with the brush with what you also paint
‘I am painting with the brush that you are painting with too.’

(10) a. Ik schilder waar -mee jij ook schildert.
I paint where with you also paint
‘I am painting with what you are painting with too.’
b. *Ik schilder met wat jij ook schildert.
I paint with what you also paint
‘I am painting with what you are painting with too.’

[4]The sentence in (8b) is unacceptable with neutral intonation. It becomes acceptable if *wat* ‘what’ is stressed, for example in a context in which the speaker is highly surprised about the choice of the object the hearer is painting with.

In sum, *'t* 'it' and *wat* 'what' do not combine with prepositions. They are substituted by respectively *'r* 'there' and *waar* 'where'.

2.2 *Met wat* 'with what' shows up

This section discusses an exception to what is shown in the previous section. I show an instance in which *met wat* 'with what' has to be used instead of *waar-mee* 'with what'. This instance comes from a mismatching free relative construction.

A mismatching free relative is a free relative construction in which the two predicates (the one in the main clause and the one in the embedded clause) combine with two different cases (i.e. the case requirements do not match). I give an example in which the R-pronoun and postposition appear before I get to the exception. Consider (11a). The predicate in the embedded clause, *schildert* 'paint', combines with an instrumental object. The predicate in the main clause, *gekocht* 'bought' combines with an accusative object. The R-pronoun and postposition *waar-mee* 'with what' is used here. The use of *met wat* 'with what' is ungrammatical in this context, illustrated in (11b).[5]

(11) a. Ik heb gekocht waar -mee jij schildert.
I have bought where with you paint
'I bought what you are painting with.'

b. *Ik heb gekocht met wat jij schildert.
I have bought with what you paint
'I bought what you are painting with.'

If the predicates are switched between the clauses, the R-pronoun and postposition do not appear anymore. In (12), *schilder* 'paint' combines with an instrumental object in the main clause and *gekocht* 'bought' combines with an accusative object in the embedded clause. The use of an R-pronoun and postposition is ungrammatical, as indicated by (12a). Instead, a combination of the regular instrumental preposition *met* 'with' and the regular wh-pronoun *wat* 'what' in used.

(12) a. *Ik schilder waar -mee jij hebt gekocht.
I paint where with you have bought
'I paint with what you bought.'

b. Ik schilder met wat jij hebt gekocht.
I paint with what you have bought
'I paint with what you bought.'

Table 1 summarizes the pattern. When the main clause predicate combines with an accusative and the embedded clause predicate with an instrumental, *waar-mee* 'with what' is grammatical

[5]In this example, *waar* 'where' takes *-mee* 'with' to the left edge of the embedded clause. It is also possible for *-mee* 'with' to be stranded, and *waar* 'where' to be moved to the left edge of the embedded clause on its own.

(i) Ik heb gekocht waar jij mee schildert.
I have bought waar you with paint
'I bought what you are painting with.'

and *met wat* 'with what' is ungrammatical. When the main clause predicate combines with an instrumental and the embedded clause predicate with an accusative, *waar-mee* 'with what' is ungrammatical and *met wat* 'with what' is used.

Table 1: Distribution between *waar-mee* and *met wat*

	waar-mee	*met wat*
m:ACC, e:INS	✓	*
m:INS, e:ACC	*	✓

In the remainder of this section I argue that the crucial point of (12b) is that the instrumental object does not form a proper constituent, i.e. it is not a constituent to the exclusion of any other elements. The other side of the coin is that constructions with R-pronouns and postpositions contain an instrumental object that does form a proper constituent.

Below I repeat the examples with instrumentals I discussed so far in this paper.

(13) a. Ik schilder 'r -mee.
I paint there with
'I am painting with it.'

b. Waar -mee schilder jij?
where with paint you with
'What are you painting with?'

c. Ik schilder met de kwast [waar -mee jij ook schildert].
I paint with the brush where with you also paint
'I am painting with the brush that you are painting with too.'

d. Ik schilder [waar -mee jij ook schildert].
I paint where with you also paint
'I am painting with what you are painting with too.'

In each of these examples the instrumental object forms a proper constituent at a certain point in the derivation. In (13a), the instrumental object forms a proper constituent in the surface order, as shown in (14a). In (13b), the instrumental object forms a proper constituent before wh- and V2- movement, shown in (14b). The structure in (14c) represents a stage in the derivation of the embedded clauses in (13c) and (13d). Again, in the stage, which comes before relative movement of the pronoun to the left periphery of the relative clause, the instrumental object forms a proper constituent.

(14) a. [[ik] [[schilder] ['r -mee]]]
b. [[jij] [[schilder] [waar-mee]]]
c. [[jij] [[ook] [[schilder] [waar-mee]]]]

Let me now show how this applies to the examples with the mismatching free relatives. The two predicates I used in the free relatives are *kopen* 'to buy' and *schilderen* 'to paint'. *Kopen* 'to buy' takes an accusative object, illustrated in (15a). *Schilderen* 'to paint' can take an instrumental as its object, shown in (15b).[6]

[6] *Schilderen* also optionally takes an (accusative) object, but I am focusing on the instrumental object here.

(15) a. Ik koop het schilderij.
I buy the painting
'I am buying the painting.'
b. Ik schilder met een kwast.
I paint with a brush
'I am painting with a brush.'

I repeat the mismatching free relative in which *waar-mee* 'with what' appears in (16). The predicate *schildert* 'paints' combines in the embedded clause with the instrumental object. The instrumental object forms a proper constituent within the embedded clause, and the it can be realized as the R-pronoun and postposition *waar-mee* 'with what'.[7]

(16) Ik heb gekocht [waar -mee jij schildert].
I have bought where with you paint
'I bought what you are painting with.'

Next, I arrive at the mismatching free relative in which *waar-mee* 'with what' cannot be used, but *met wat* 'with what' appears. The embedded clause predicate *gekocht* 'bought' combines with an accusative object. The accusative object of a verb is always *wat* 'what', as I showed in (8a). The instrumental only comes into the picture in the main clause, when *schilder* 'paint' combines with an instrumental object. At no point in the derivation does the instrumental object form a proper constituent, and *waar-mee* 'with what' does not surface.

(17) Ik schilder met [wat jij hebt gekocht].
I paint with what you have bought
'I paint with what you bought.'

The mismatching free relative in (17) is not the only construction in which the string *met wat* 'with what' appears. I give examples of two more occurrences in (18). In (18a), *wat* 'what' is the *wat* 'what' in the so-called *wat voor* 'what for'-construction (cf. Corver, 1991). In (18b), *wat* appears as a quantifier, and it means 'some'. In both constructions *wat* 'what' takes a complement and *met wat* 'with what' do not form a proper constituent. The brackets within the examples indicate the constituency.

(18) a. [Met [wat [voor [potloden]]] teken jij?
with what for pencils draw you
'What kind of pencils do you with?'
b. Ik wil graag thee [met [wat [suiker]]].
I want please tea with some sugar
'I would like to have tea with some sugar.'

(19) summarizes what I showed in this section. *Met wat* 'with what' can never surface when *met* 'with' and *wat* 'what' form a proper constituent. It always becomes *waar-mee* 'with what', as shown in (19a). *Met wat* 'with what' can appear when the instrumental object does not form a proper constituent. This can be either when *wat* 'what' takes a complement before it combines

[7] I assume that the accusative case requirement of *gekocht* 'bought' is satisfying by grafting a subconstituent of *waar-mee* 'with what' (Bergsma, 2019).

with *met* 'with', as shown in (19b), representing the examples in (18). The other option is that *wat* 'what' is part of the a clause that *met* 'with' is not a part of, schematized as (19c) as an illustration of (17).

(19) a. [[met] [wat]] → [waar-mee]
b. [met [wat [X]]]
c. [met [[wat] [X]]]

3 Decomposing *waar-mee* and *met wat*

In this section I decompose *waar-mee* 'with what' and *met wat* 'met wat' into smaller units, which I connect to parts of syntactic structure. *Waar-mee* 'with what' and *met wat* 'met wat' spell out the same set of features but the distribution is different. I decompose *waar-mee* and *met wat* as I show in (20). Earlier works have decomposed these pronouns in similar ways (cf. Hachem 2015; Noonan 2017; Wesseling 2018).

(20) a. w -aa -r -mee
w -DEIX -LOC -INS
b. met w -a -t
INS w -DEIX -N.SG

In this section I first identify *w* and *a* as morphemes that appear in both expressions. Putting these two aside, I concentrate on *'rmee* 'with it' and *met 't* 'with it'. Along the way I introduce some necessary theoretical background on Nanosyntax.

3.1 Overlap: *w-* and *-a-*

Let me start with the morphemes *w* and *a* that appear in both *waar-mee* 'with what' and *met wat* 'met wat'. I assume that they correspond to the same syntactic structure in both. As I am interested in the differences between the two expressions, I do not discuss the featural content of *w* and *a* into depth.

For *w* I follow Hachem (2015) who investigated *d* and *w* elements in German and Dutch. In her work, *d* establishes a definite reference and *w* triggers the construction of a set of alternatives in the sense of Rooth (1992) (see Hachem 2015 for discussion).[8]

(21) wP ⟺ *w*
△
W

I follow several authors (cf. Lander 2016; Noonan 2017; Wesseling 2018) that assume the morpheme *a* is related to deixis. Dutch distinguishes between proximal by using *ie* (/i:/) and *i* (/ɪ/)

[8]Throughout the paper, ⟺ indicates the pairing between a lexical tree and a phonological form in a lexical entry, and ⟹ indicates how a node in the syntactic structure is spelled out.

and distal by using *aa* (/aː/) and *a* (/ɑ/), illustrated in (22).[9] I analyze the transformation from /ɪ/ into /iː/ and /ɑ/ into /aː/ as a result of the final r.

(22) a. h-ie-r
here
b. d-aa-r
there
c. d-i-t
this
d. d-a-t
that

For the purpose of this paper I let *a* correspond to DEIXP.

(23) DEIXP $\Leftrightarrow$ *a*

DEIX

I put *w* and *a* aside for now, assuming they spell out the same syntactic structure in *waar-mee* 'with what' and *met wat* 'with what'. This leaves *'r-mee* 'with it' and *met 't* 'with it'.

(24) a. 'r -mee
there with
b. met 't
with it

3.2 Differences: *'rmee* vs. *met 't*

In this section I discuss the forms *met 't* 'with it' and *'rmee* 'with it'. I set up an account that makes the ungrammaticality of *met 't* and the appearance of *'rmee* follow from spellout. The analysis accounts for the following three observations, taking *met 't* as the point of departure. First, *met* 'with' changes from being a preposition to being a postposition. This process is restricted to inanimate pronouns, and it does not apply to full DPs and animate pronouns. Second, *met* changes form into *-mee*. Third, *'t* is replaced by *'r*, a morpheme that is associated with the locative in Dutch.

3.2.1 *'t* vs. *'r*

In this section I give the lexical entries for *'t* and *'r*, and I show that *'r* is actually the base form and *'t* a suppletive nominative, accusative and dative.

Let me start with the lexical entry for *'t*. *'t* 'it' can be used as a subject (associated with nominative), direct object (associated in accusative) and indirect object (associated with dative),

[9] A question that remains open is why wh-elements combine with the distal marker *a*, and they cannot with the proximal marker *i/ie*.

as shown in (25).

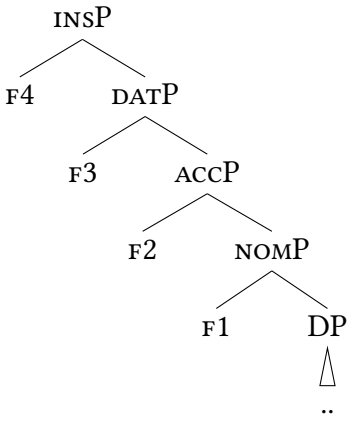
(25) a. ’t Staat in de hal.
3SG.N.NOM stands in the hallway
‘It is standing in the hallway.’
b. Ik zie ’t.
I see 3SG.N.ACC
‘I see it.’
c. Ik heb ’t een klap gegeven.
I have 3SG.N.DAT a hit given
‘I gave it a hit.’

Pronouns in other genders alternate between nominative (non-oblique) and accusative/dative (oblique) in these contexts, illustrated in (26).

(26) a. Hij staat in de hal.
3SG.M.NOM stands in the hallway
‘He is standing in the hallway.’
b. Ik zie hem.
I see 3SG.M.ACC
‘I see it.’
c. Ik heb hem een klap gegeven.
I have 3SG.M.DAT a hit given
‘I gave him a hit.’

For case, I follow Caha (2009) in that case features are organized as in the containment relation in (27). The higher, more complex cases contain the smaller, less complex cases. For the purpose of this paper, I only show case features relevant for the argument.

(27)

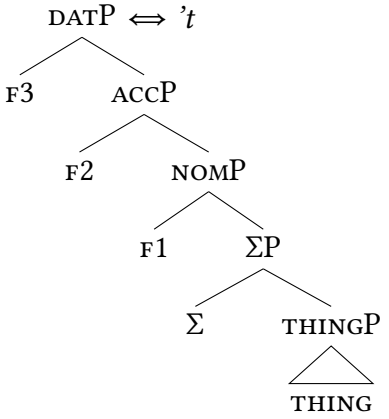


Following the distinctions from Cardinaletti and Starke (1996), I assume *’t* ‘it’ is a weak pronoun. It is not a clitic, because it can occur in sentence initial position, shown in (25a). It is not a strong pronoun, because it cannot be coordinated, as indicated in (28a). (28b) shows that *’t* ‘it’ needs to combine with *da-*/*di-* to be able to be coordinated.

(28) a. *Hij en 't staan in de hoek.
he and it stand in the corner
'He and it are standing in the corner.'
b. Hij en dit/dat staan in de hoek.
he and this/that stand in the corner
'He and it are standing in the corner.'

(29) shows the lexical entry for *'t* 'it'. I assume that the *'t* contains the ontological category THING (Kayne, 2005). The feature Σ indicates that the pronoun is a weak pronoun. For reasons of space I let singular be the absence of number and neuter the absence of gender. The morpheme *'t* can act as nominative, accusative and dative, as I showed in (25).[10]

(29)



This lexical entry can lexicalize the DATP, but also the ACCP and NOMP. This is due to the Superset Principle.

(30) The Superset Principle Starke (2009):
A lexically stored tree matches a syntactic node iff the lexically stored tree contains the syntactic node.

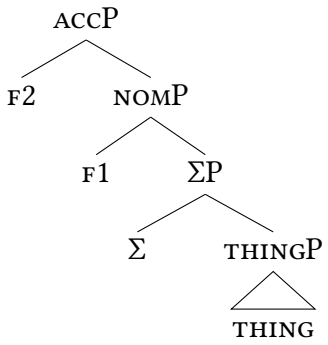
In other words, a lexically stored structure does not have to be identical to the syntactic structure. It is enough if the syntactic structure is contained in the lexically stored tree. This has as a consequence that the lexical entry in (29) can also be inserted in (31a) and (31b).

[10] Another possibility is to claim that *'t* can only spell out THING and Σ and it combines with a zero suffix for the cases up to dative. This could be the same zero marker that full DPs combine with.

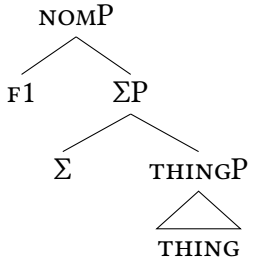
(i) a. De kast-∅ staat in de hal.
the cabinet-NOM stands in the hallway
'The cabinet is standing in the hallway.'
b. Ik zie de kast-∅.
I see the cabinet-ACC
'I see the cabinet.'
c. Ik heb de kast-∅ een klap gegeven.
I have the cabinet-DAT a hit given
'I gave the cabinet a hit.'

The proposed account fares equally well with both alternatives. I work the proposal out with *'t* realizing the cases up to the dative.

(31) a.



b.

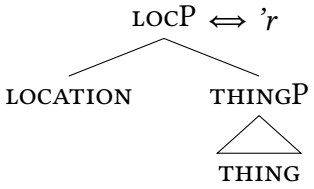


Let me move on to *'r*. *'r* 'there' can be used as a locative.

(32) Ik ben 'r al geweest.
I am there already been
'I have already been there.'

I follow Baunaz et al. (2018) in assuming that the ontological category LOCATION contains THING.[11]

(33)



Notice here that, via the Superset Principle, *'r* can be used to realize the feature THING as well, as it is contained in LOCP. Moreover, in a syntactic structure like in (34) the lexical entry (33) will be inserted and not (29).

(34)

This is due to the Elsewhere Condition. The idea is that when two lexical entries are both candidates for spellout, the most specific is inserted.

(35) The Elsewhere Condition (Kiparsky 1973, formulated as in Caha 2020):
When two entries can spell out a given node, the more specific entry wins. Under the Superset Principle governed insertion, the more specific entry is the one which has fewer unused features.

[11] Baunaz et al. (2018) place in addition PERSON between THING and LOCATION, which I have left out here.

The syntactic structure in (33) only has LOC as an unused feature, whereas in (29) Σ up to F3 remain unused.

This means that the caseless base form of the neuter singular pronoun in Dutch is actually *'r* and *'t* should be analyzed as a suppletive nominative, accusative and dative. The base form only shows up in the higher cases, from instrumental on, see Table 2.

Table 2: Fragment Dutch N.SG

	N.SG
NOM	't
ACC	't
DAT	't
INS	-r -mee

A similar situation appears in Iron Ossetic, shown in Table 3. In the first person singular of this language, it is only the nominative that is suppletive: *æz*. The higher cases have the stem *mæn* and they combine with the suffixes that nouns normally also combine with.

Table 3: Fragment Iron Ossetic 1.SG and noun (Erschler et al., 2012)

	1.SG	head
NOM	æz	sær-∅
ACC	mæn-∅	sær-∅
DAT	mæn-æn	sær-æn
INS	mæn-æj	sær-æj

Caha (2019) uses evidence from a phenomenon called suspended affixation to argue that *mæn* is a caseless stem and and *æz*. Consider the ordinary coordination in (36a). Both conjuncts are marked by a plural marker and a case marker. Suspended affixation is shown in (36b). Here the case marker only appears on the second conjunct and not on the first one without changing the interpretation. *Bæx-tæ* 'horse-PL' in (36b) does not carry any case marking here.

(36) a. bæx-t-imæ æmæ gæl-t-imæ
horse-PL-COM and ox-PL-COM
b. bæx-tæ æmæ gæl-t-imæ
horse-PL and ox-PL-COM
'with horses and oxen' (Iron Ossetic, Erschler et al. 2012, p. 165)

(37) gives examples of the first person singular in a suspended affixation contexts. It shows that it is *mæn* that appears as a caseless first conjunct and that the use of *æz* is ungrammatical. This means that *mæn* is the bare stem that combines with case markers, and *æz* the suppletive nominative. In Section 4 I show how a derivation with this type of elements works in Nanosyntax.

(37) a. mæn æmæ Zauyr-æn
1.SG and Zaur-DAT

b. *æz æmæ Zauyr-æn
1.**sg** and Zaur-DAT
'me and Zaur' (Iron Ossetic, Беляев 2014, p. 39 after Caha 2019)

The point of showing the Ossetic example is that Dutch is not unique in having suppletive forms that are less marked (in this case nominative, accusative and dative), and higher cases that are a combination of a suffix and a caseless base form.

3.2.2 *-mee* vs. *met*

The last two forms to specify lexical entries for are *-mee* 'with' and *met* 'with'. An important distinction between these two is that *-mee* appears after the element it combines with ('R), while *met* appears before the element it combines with (*'t*). I will analyze *-mee* as a postposition and *met* as a preposition.[12] In this section I discuss the relation between prepositions and postpositions, and how this is modeled with the case hierarchy in Nanosyntax (Caha, 2009).

In the previous section I argued that *'t* realizes case features up to F3 (see (29)). However, case can also be expressed by prepositions (or prefixes) and postpositions (or suffixes). The division between which cases are expressed by prepositions and which are expressed by postpositions is not arbitrary.

(38) The preposition/postposition hierarchy
a. If the expression of a particular case in the case sequence (below) involves a preposition, then all cases to its right do as well.
b. The case sequence: NOM – ACC – DAT – GEN - INS – COM (Caha, 2009)

The result of that is that a PP can contain a preposition and a suffix. In the German example in (39), the dative suffix is used with a instrumental preposition.

(39) mit ein -em Löffel
with a -DAT.SG spoon
'with a spoon' (German)

With the case hierarchy in Nanosyntax this can be modeled by letting the DP move as high as above the DATP in the syntactic structure in (27). The features below the DATP are realized as a suffix, and the features above DATP are realized as a preposition.

[12] A topic related to this paper is the different positioning of identical adpositions in Dutch (see Caha (2010) for an account of German and Dutch and Pretorius (2017) for Afrikaans). In (i), *in* 'in' changes meaning depending on whether it proceeds or follows the DP, it is respectively locational or directional.

(i) a. Ik klim in de boom.
I climb in the tree
'I am climbing in the tree.'
b. Ik klim de boom in.
I climb the tree in
'I am climbing into the tree.'

In (i), the movement of the adposition is driven by movement, and it is meaningful. The movement of R-pronouns I discuss in this paper is driven by spellout, which is meaningless.

There is variation with respect to how high a DP can move in the structure, both between languages and within languages. An example of the latter comes from Bulgarian. (40a) shows that pronouns can take the suffix *-i* to realize dative, but full DPs need a preposition *na* 'to'.

(40) a. Tazi duma m -i e nepoznata.
that word I -DAT is unfamiliar
'That word is unfamiliar to me.'
b. Tazi duma e nepoznata na sina mi.
that word is unfamiliar to son my
'That word is unfamiliar to my son.' (Bulgarian, Caha 2009, p. 39)

In Dutch the split is not between pronouns and full DPs but between inanimate pronouns on the one hand and animates and full DPs on the other hand. In Dutch, inanimate pronouns combine with the postposition *-mee* (see (41a) and not with the preposition *met* (see (41b)).

(41) a. Ik schilder 'r -mee.
I paint there -with
'I am painting with it.'
b. *Ik schilder met 't
I paint with it
'I am painting with it.'

Animate pronouns and full DPs, however, combine with the preposition met, as shown in (42a) and (42b). The use of the postposition *-mee* is ungrammatical (see (42c) and (42d)).

(42) a. Ik schilder samen met hem.
I paint together with him
'I am painting with him.'
b. Ik schilder samen met de man.
I paint together with the man
'I am painting together with the man.'
c. *Ik schilder samen 'm-mee.
I paint together him-with
'I am painting together with him.'
d. *Ik schilder samen de man-mee.
I paint together the man-with
'I am painting together with the man.'

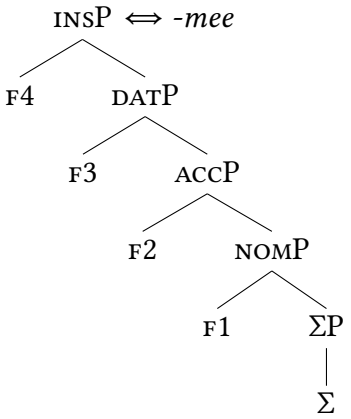
In other words, inanimates can move higher than animates and full DPs in Dutch. To be more precise, the inanimate *'t* is replaced by *'r*, and this element can move as high as above the dative to combine with *-mee*. I return to what it is that prevents animates and full DPs from being combined with *-mee* shortly.

First I show what the lexical entry of *-mee* looks like. Two facts need to be captured. *-mee* combines with *'r* and is a postposition. First, *-mee* expresses instrumental (and comitative) case and it combines with *'r*.[13] This means that the combination of *'r* and *-mee* has to realize THING, Σ

[13]For reasons of space I leave COMP out of the lexical entries and discussion, even though *-mee* 'with' and *met*

and all case features up to F4. So far, *'r* 'there' only realizes the feature THING. This leaves Σ and F1 to F4 to be realized by *-mee*. I give the lexical tree of *-mee* in (43).

(43)

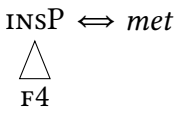


This leads me to the second point: *-mee* is a postposition. Notice that the foot of the structure has a singleton feature. Nanosyntax distinguishes pre-elements from post-elements by the shape of their lexical entry (Starke, 2018). As a result, it follows from the spellout procedure whether an element appears before or after the previously inserted element. Post-elements have a unary bottom (i.e. the foot of the tree is a single feature), so they can only appear as the result of movement. Post-elements have a binary bottom (i.e. the foot of the tree consists of two features), so they cannot be a candidate as a result of movement. I illustrate this in Section 4.

Why does *-mee* not combine with animates and full DPs? I claim that has to do with the bottom feature of the lexical entry of *-mee*. Full DPs do not take features related to pronominal strength. According to the Superset Principle, a lexical tree can match a syntactic tree with a subpart of the features, but a tree can only shrink from the top, so *-mee* will always realize Σ. It is less clear to me why animates do not combine with *-mee*. The crucial difference between animates and inanimates if gender features. For now I assume that gender features are situated between Σ and F1. The lexical entry of *-mee* includes both these features, so any additional gender features are incompatible with *-mee*. So far I do not have independent evidence for placing gender features between features of pronominal strength and case, and I leave this for future research.

So far I discussed *-mee* is a postposition, which follows *'r* and is stored with a unary bottom. *Met*, on the other hand, is a preposition, it precedes *'t*, so it should be stored with a binary bottom. The highest case feature *'t* can realize is F3, so the preposition realizes F4. I give the lexical entry for *met* in (44).

(44)



In the next section I put all features back together in a derivation and I show how *waar-mee* 'with what' and not *met wat* 'with what' surfaces when all features form a constituent.

'with' can also express comitative.

4 In a derivation

Before I show that *waar-mee* 'with what' is used when all features form a proper constituent, I need to make some assumptions about the spellout procedure in Nanosyntax explicit. Spellout happens in a cyclic derivation, following a spellout algorithm (Starke, 2018). After each instance of merge, spellout takes place. If no spellout exists for the phrase created by the newly added feature, evacuation movements specified in the spellout algorithm take place. The algorithm is given in (45).

(45) Merge F and
   a. Spell out FP.
   b. If (a) fails, attempt movement of the spec of the complement of F, and retry (a).
   c. If (b) fails, move the complement of F, and retry (a).

When a new match is found, it overrides previous spellouts.

(46) Cyclic Override (Starke, 2018):
Lexicalisation at a node XP overrides any previous match at a phrase contained in XP.

If the spellout procedure in (45) fails, backtracking takes place. This is the operation that leads from the suppletive nominative, accusative and dative *'t* to the base form *'r*.

(47) Backtracking (Starke, 2018):
When spellout fails, go back to the previous cycle, and try the next option for that cycle.

If backtracking also does not help, a specifier is constructed. This is what happens when the preposition *met* 'with' is inserted.

(48) Spec Formation (Starke, 2018):
If Merge F has failed to spell out (even after backtracking), try to spawn a new derivation providing the feature F and merge that with the current derivation, projecting the feature F at the top node.

With this theoretical background in place, I can turn to the derivation. I first show how *'rmee* 'with it' is constructed. I leave out *w* and *a* to not unnecessarily complicate the story.[14]

I start with THING. The two candidates here are (29) and (33). Following the Elsewhere Condition, (33) wins the competition because it contains less unused material.

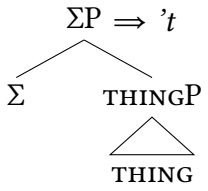
(49) THINGP $\Longrightarrow$ *'r*

[14] I assume that the WP and DEIXP appear lower in the structure than the case features, so the functional sequence is as given in (i).

(i) [[[[[[[[THING] DEIX] W] F1] F2] F3] F4]

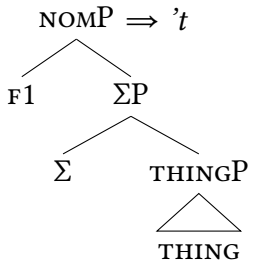
In the next step, Σ is merged. (33) is no longer a candidate because it does not contain Σ. (29) still is a candidate, because it contains all features in (50). The spellout is overridden and the structure is realized as *'t*.

(50)



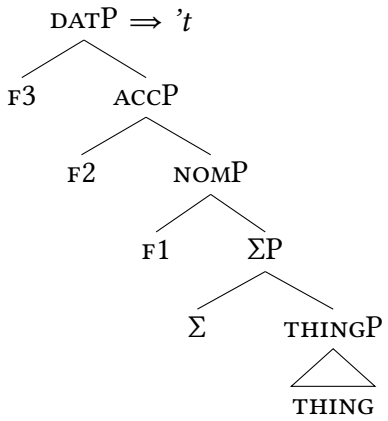
Then F1 is merged. This structure can still be realized by *'t*.

(51)



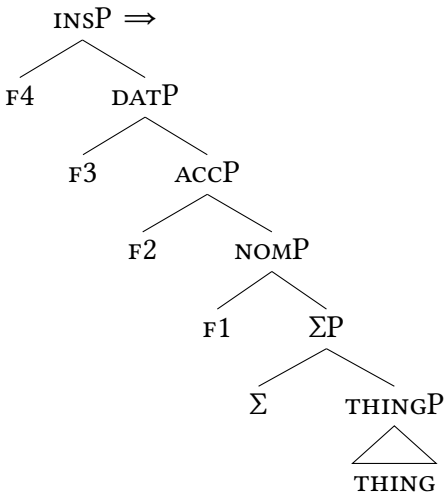
The same holds for the next two steps in which F2 and F3 are merged: the structure can still be spelled out as *'t*.

(52)



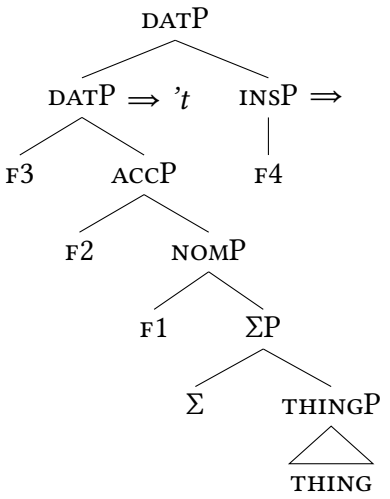
Then F4 is merged, as shown in (53). (29) can no longer spell out the structure, because it does not contain F4. There is also no other candidate to spell out the structure as it is.

(53)



According to the spellout algorithm in (45), it should be attempted to move the spec of the complement of F4. However, there is no specifier in (53), so this does not apply. The second movement option is complement movement. The complement of F4 moves to the specifier of INSP, resulting in the structure in (54). The lexicon does not contain an entry with INSP which contains only F4.[15]

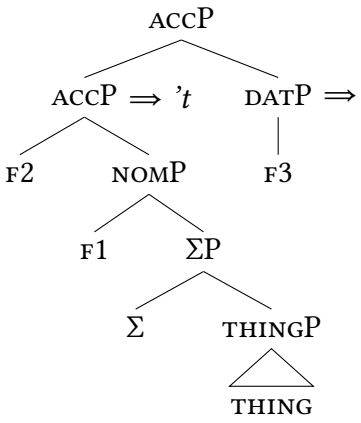
(54)



As I formulated in the introduction of this section, the operation called backtracking is triggered (see (47)). This means that the derivation goes back to the previous cycle, and the next option for that cycle is tried. In this case, the previous cycle is the one in which F3 is merged. The next option for that cycle is spec-to-spec movement. As there is no specifier, this does not apply. The option after that is complement movement, shown in (55). However, there is no match in the lexicon for an DATP that contains only F3.

[15] *Met* 'with' is not a candidate, because the syntactic structure has a unary bottom and the lexical structure has a binary bottom.

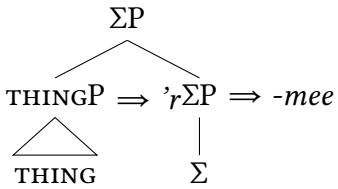
(55)



This means that backtracking proceeds further, into the cycle in which F2 was merged. Again, spec-to-spec movement does not apply because there is no specifier, and complement movement can be tried, but there is no fitting lexical entry available. The same holds for the cycle in which F1 is merged.

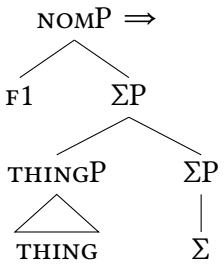
The situation changes when the derivation comes to the cycle in which Σ was merged. At this stage, THING was realized as *'r*. Again there was no specifier, spec-to-spec movement does not apply. However, complement movement provides a structure that is a match for the lexical entry in (43): *-mee*.[16]

(56)



From this point on the previously unmerged features are merged again one by one. First, F1 is merged again, shown in (57). No match exists for this syntactic structure.

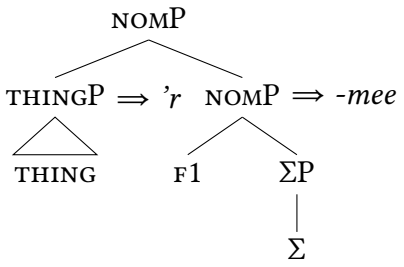
(57)



Following the spellout algorithm, the next step is spec-to-spec movement. The result is shown in (58). In that configuration F1 can be realized together with Σ as *-mee*.

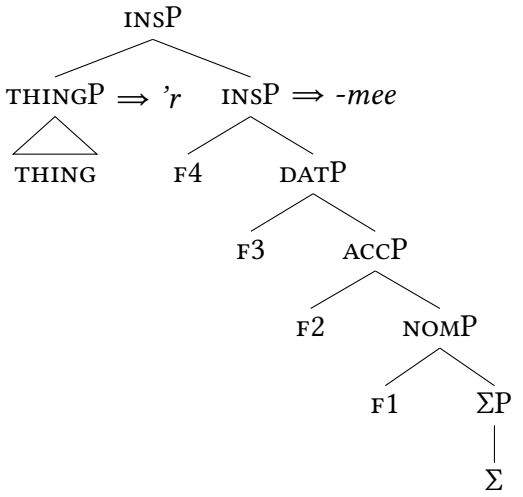
[16]This picture resembles the proposal of (Abels, 2003) in that not the whole complement of P is moved but only a part is subextracted. The current analysis differs in that the movement is not syntactically driven but by spellout.

(58)



The same happens for F2, F3 and F4. The features are merged one at a time, there is no spellout after merging the feature, but there is a spellout after spec-to-spec movement. I show the situation after F4 is realized as (59).

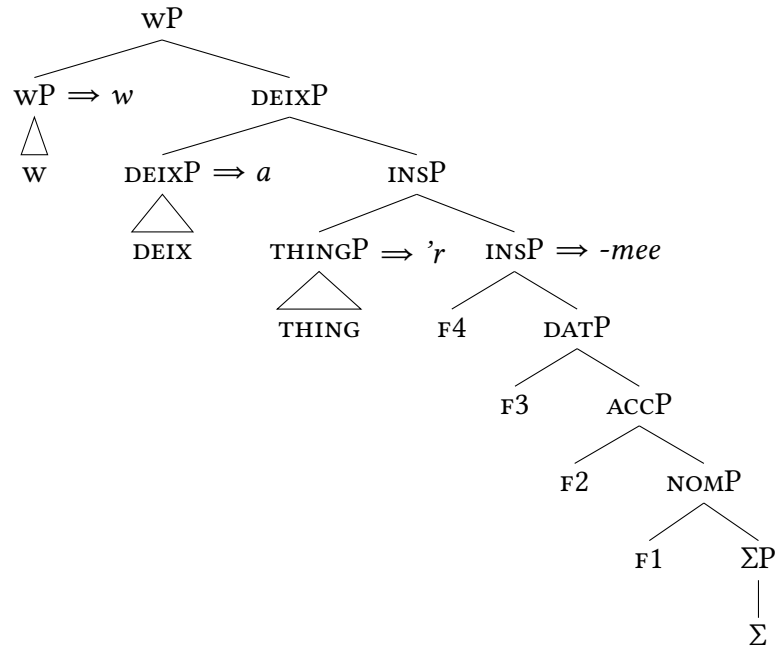
(59)



I skip over the details of how *w* and *a* end up in their positions.[17] The final result of the structure for *waar-mee* 'with what' look as in (60).

[17] I assume that WP and DEIXP are both complex specifiers that are created after THING is spelled out in (49). After each instance of merge after that, backtracking takes place, the complex specifier is detached from the structure and the case features are spelled out together with THING or as the postposition *-mee*.

(60)



A consequence of analyzing *-mee* 'with' as a postposition is that *'r* and *-mee* always form a constituent to the exclusion of *w* and *a*. At first sight this seems problematic, because it is possible for *waar* 'where' to *-mee* 'with'. I repeat the relevant example in (61).

(61) Ik heb gekocht waar jij mee schildert.
I have bought waar you with paint
'I bought what you are painting with.'

There is no constituent in (60) that contains *waar* but not *-mee*, so it is not possible to move *waar* from (60) and strand *mee* in the process. To resolve this situation I follow Noonan (2017) in assuming that the phrase containing the adposition (*-mee*) can syntactically move to a position higher in the structure. Evidence that *mee* 'with' has moved comes from the ungrammaticality of (62). This shows that *mee* 'with' cannot be stranded in its base position (see also (14c)).

(62) *Ik heb gekocht waar jij schildert mee.
I have bought waar you paint with
'I bought what you are painting with.'

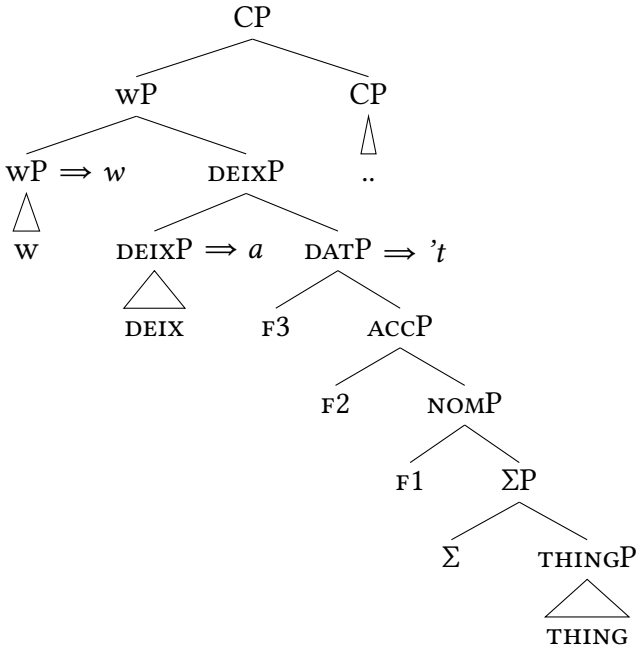
The movement of the adposition has the typical distribution of that of verbal particles (cf. van Riemsdijk 1978; Noonan 2017. The trigger for the movement of *mee* could be the feature Σ (which is contained in *mee* 'with'), associated with weak pronouns. Allowing *mee* to subextract from the wP resolves the issue. With *-mee* having moved out, the wP only contains features that are realized as *waar*, and it moves to the left edge of the clause, resulting in the surface order in (61).

So far I showed how *waar-mee* 'with what' is derived if all syntactic features form a constituent. Next I address how *waar-mee* 'with what' is blocked and *met wat* 'with what' appears when the features do not form a proper constituent is derived. An example of a situation in which all features do not form a constituent is given in (63).

(63) Ik schilder met wat jij hebt gekocht.
I paint with what you have bought
'I paint with what you bought.'

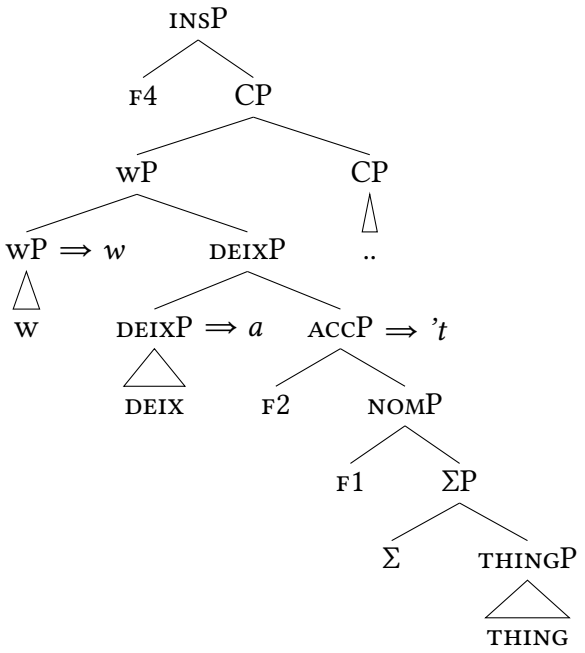
I start at the point at which *wat* 'what' is part of a syntactic structure with the rest of a relative clause as a sister. Even though F3 is not part of the embedded clause, I already added it to the structure. While it is unclear why, syncretic forms behave differently in that they seem to resolve case conflicts in free relatives and related phenomena (cf. Groos and van Riemsdijk 1981; Pullum and Zwicky 1986; Ingria 1990). I give the syntactic structure from which I start in (64).

(64)



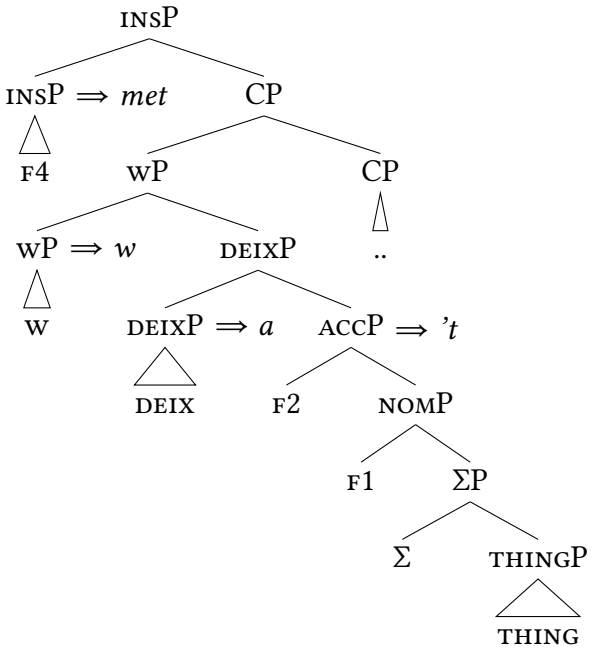
At this point F4 is merged, as shown in (65). Because of the presence of the CP, there is no possibility for F4 to be spelled out, even after the regular movements and backtracking.

(65)



The last resort possibility to spell out features is set in motion: a complex specifier is created, as described in (48). This is illustrated in (66).

(66)



This section showed how the instrumental inanimate relative pronoun is realized as *waar-mee* 'with what' when all relevant features form a constituent, and how *met wat* 'with what' appears when they do not.

5 Conclusion and discussion

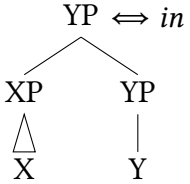
In this paper, I discussed the instrumental R-pronoun and postposition *waar-mee* 'with what' in Dutch. The main intuition is that this form appears when features of an instrumental inanimate object form a proper constituent. The form cannot appear, and *met wat* 'with what' surfaces instead, when all relevant features do not form a proper constituent. The described pattern follows from a core assumption in Nanosyntax: phrasal spellout spells out constituents (Starke, 2009).

Under this analysis, there is no need for a filter that rules out a combination of a preposition and an inanimate pronoun. As long as the relevant features form a proper constituent, the spellout algorithm ensures the R-pronoun and postposition takes precedence over the other form. The fact that locatives are syncretic with R-pronouns is not a coincidence. The lexicon contains a single entry for a locative, which is the one used for R-pronouns as well. The change in placement of the adposition is a consequence of spellout too. *Mee* 'with' is a postposition and is stored differently from the preposition *met* 'with', which leads to the correct placement with different constituency. The fact that *met* 'with' and *mee* 'with' differ phonologically can also be captured by storing them as two separate lexical entries.

In the remainder of this section I discuss how this analysis can be extended to other adpositions in Dutch. Giving *met* 'with' and *-mee* 'with' two distinct lexical entries has as a consequence that the phonological overlap between them seems like a coincidence. This can be questioned, because there is only one more preposition that changes form when it appears postpositionally. This preposition is *tot* 'to', and it changes into *toe* as a postposition. It has in common with *met* 'with' that it is the only preposition in Dutch that has the phonological structure CVt. For now I take the phonological resemblance to be a relic from the past without having any influence on the synchronic data.

In all other cases the adposition does not change form when it combines with an R-pronoun, e.g. *in* 'in'. If this proposal is on the right track, elements as *in* can be used as either a preposition or as a postposition. The lexical entry should then be usable as pre-element and as post-element, so it needs to have a binary bottom and a unary foot simultaneously. The lexical entry in (67) would be a candidate for such an element. YP can be inserted as a post-element, and XP can be inserted via the Superset Principle as a pre-element.

(67)



I leave it to future research to investigate such a proposal.

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Chapter 2

A recurring pattern

This chapter introduces the pattern that forms the focus of the first part of the dissertation. In Section 2.1 I show that case competition in headless relatives adheres to the case scale in (1).

(1) NOM < ACC < DAT

Then I show that this pattern is not unique to headless relatives. It appears in more syntactic and morphological phenomena. Section 2.2 discusses two implicational hierarchies that show the same case ordering. The hierarchies concern agreement and relativization across languages. Section 2.3 shows that the case scale also shows up in morphological patterns. It can be observed in patterns of syncretism and in morphological containment.

2.1 In headless relatives

As the name suggests, headless relatives are relative clauses that lack an (overt) head. The internal case, the case from the relative clause, and the external case, the case from the main clause, compete to surface on the relative pronoun. It has been argued in the literature that the two competing cases always adhere a to particular case scale (cf. Harbert, 1978; Pittner, 1995; Vogel, 2001; Grosu, 2003; Bergsma, 2019; Caha, 2019). This is the scale I gave in the introduction, repeated here in (2).

Elements more to the right on this scale win over elements more to the left on this scale.[1]

(2) NOM < ACC < DAT

This can be reformulated as follows. In a competition, dative wins over accusative, and dative wins over nominative. Additionally, accusative wins over nominative. In this section I illustrate this scale with examples. When two cases compete, the relative pronoun always appears in the case more to the right on the case scale. It does not matter whether it is the internal or the external case. I illustrate this with examples from headless relatives in Gothic (Harbert, 1978).

I start with the competition between dative and accusative. Following the case scale in (2), the relative pronoun appears in dative case and never in accusative.

Consider the example in (3), repeated from the introduction. In this example, the internal case is dative and the external case is accusative. The relative clause and the relative pronoun are marked in bold. The internal case is dative. The preposition *ana* 'on' takes dative complements. The external case is accusative. The predicate *ushafjands* 'picking up' takes accusative objects. The relative pronoun *þamm(a)* 'who.DAT' appears in the internal case: the dative. Examples, in which the relative pronoun appears in accusative case, the internal case is dative and the external case is accusative, are unattested.

(3) ushafjands **ana þamm -ei lag**
picking up$_{[ACC]}$ on$_{[DAT]}$ what.DAT COMP lay
'picking up (that) on which he lay'
(Gothic, Luke 5:25, adapted from Harbert 1978: 343)

Consider the example in (4), repeated from the introduction. In this example, the internal case is accusative and the external case is dative. The relative clause is marked in bold, the relative pronoun is not. The internal case is accusative. The predicate

[1] In the literature about headless relatives, the genitive is often discussed together with the nominative, accusative and dative (cf. Harbert, 1978; Pittner, 1995). In this dissertation I do not discuss the genitive. The reason is that I restrict myself to cases that appear in all possible case competition combinations. As the genitive does not fulfill that requirement, it is therefore excluded. In Chapter 7 I briefly return to the issue.

qiþiþ ‘say’ takes accusative objects. The external case is dative. The predicate *taujau* ‘do’ takes dative indirect objects. The relative pronoun *þamm* ‘who.DAT’ appears in the external case: the dative. Examples, in which the relative pronoun appears in accusative case, the internal case is accusative and the external case is dative, are unattested.

(4) hva nu wileiþ ei taujau þamm **-ei qiþiþ þiudan Iudaie**?
what now want that do$_{[DAT]}$ who.DAT -COMP say$_{[ACC]}$ king of Jews
‘what now do you wish that I do to (him) whom you call King of the Jews?’
(Gothic, Mark 15:12, adapted from Harbert 1978: 339)

I continue with the competition between dative and nominative. Following the case scale in (2), the relative pronoun appears in dative case and never in nominative.

Consider the example in (5), in which the internal case is dative and the external case is nominative. The relative clause and the relative pronoun are marked in bold. The internal case is dative. The predicate *fraletada* ‘is forgiven’ takes dative objects. The external case is nominative. The predicate *frijod* ‘loves’ takes nominative subjects. The relative pronoun *þamm(a)* ‘who.DAT’ appears in the internal case: the dative. Examples, in which the relative pronoun appears in nominative case, the internal case is dative and the external case is nominative, are unattested.

(5) iþ **þamm -ei leitil fraletada** leitil frijod
but who.DAT -COMP little is forgiven$_{[DAT]}$ little loves$_{[NOM]}$
‘but the one whom little is forgiven loves little’
(Gothic, Luke 7:47, adapted from Harbert 1978: 342)

Consider the example in (6), in which the internal case is nominative and the external case is dative. The relative clause is marked in bold, the relative pronoun is not. The internal case is nominative. The predicate *sind fraþjaiþ* ‘are above’ takes a nominative subject. The external case is dative. The predicate *fraþjaiþ* ‘think on’ takes dative indirect objects. The relative pronoun *þaim* ‘what.DAT’ appears in the external case: the dative. Examples, in which the relative pronoun appears in nominative case, the internal case is nominative and the external case is dative, are unattested.

(6) þaim **-ei** **iupa** **sind** fraþjaiþ
what.DAT -COMP above are$_{[NOM]}$ think on$_{[DAT]}$
'set your mind on those which are above'
(Gothic, Col. 3:2, adapted from Harbert 1978: 339)

I finish with the competition between accusative and nominative. Following the case scale in (2), the relative pronoun appears in accusative case and never in nominative.

Consider the example in (7), in which the internal case is accusative and the external case is nominative. The relative clause and the relative pronoun are marked in bold. The internal case is accusative. The predicate *frijos* 'love' takes accusative objects. The external case is nominative. The predicate *siuks ist* 'is sick' takes nominative subjects. The relative pronoun *þan* 'who.ACC' appears in the internal case: the accusative. Examples, in which the relative pronoun appears in nominative case, the internal case is accusative and the external case is nominative, are unattested.

(7) **þan** **-ei** **frijos** siuks ist
who.ACC -COMP love$_{[ACC]}$ sick is$_{[NOM]}$
'the one whom you love is sick'
(Gothic, John 11:3, adapted from Harbert 1978: 342)

Consider the example in (8), in which the internal case is nominative and the external case is accusative. The relative clause is marked in bold, the relative pronoun is not. The internal case is nominative. The predicate *ist us Laudeikaion* 'is from Laodicea' takes nominative subjects. The external case is accusative. The predicate *ussiggwaid* 'read' takes accusative objects. The relative pronoun *þo* 'what.ACC' appears in the external case: the accusative. Examples, in which the relative pronoun appears in nominative case, the internal case is nominative and the external case is accusative, are unattested.

(8) jah þo **-ei** **ist** **us** **Laudeikaion** jus ussiggwaid
and what.ACC -COMP is$_{[NOM]}$ from Laodicea you read$_{[ACC]}$
'and read that which is from Laodicea'
(Gothic, Col. 4:16, adapted from Harbert 1978: 357)

A summary of the Gothic data as a whole is given in Table 2.1. The left column shows the internal case between square brackets. The upper row shows the external case between square brackets. The other cells indicate the case of the relative pronoun. The diagonal is left blank, because these are instances in which the internal and external case match. The remaining six cells show instances where the internal and external case differ. Within the cells, two cases are given. The case in the lower left corner stands for the relative pronoun in the internal case. The case in the upper right corner stands for the relative pronoun in the external case. The grammatical examples are marked in gray. The unattested examples are marked with an asterix and are unmarked.[2]

Table 2.1: Case competition in Gothic headless relatives

EXT / INT	[NOM]	[ACC]	[DAT]
[NOM]		ACC *NOM	DAT *NOM
[ACC]	*NOM ACC		DAT *ACC
[DAT]	*NOM DAT	*ACC DAT	

The three instances in the lower left corner correspond to the examples (7), (5) and (4). In the attested examples, the relative pronoun appears in the internal case. The three instances in the upper right corner correspond to the examples in (8), (6) and (3). In the attested examples, the relative pronoun appears in the external case.

To sum up, case competition in headless relative is subject to the case scale, repeated in (9).

[2]Throughout this dissertation * stands for 'not found in natural language'. For extinct languages this means that there are no attested examples. For modern languages it means that the examples are ungrammatical.

Table 2.2: Summary of Gothic matching headless relative data

	[NOM]	[ACC]	[DAT]
[NOM]		ACC	DAT
[ACC]	ACC		DAT
[DAT]	DAT	DAT	

(9) NOM < ACC < DAT

If two cases compete, dative wins over accusative and nominative, and accusative wins over nominative. In this section I gave examples from Gothic that illustrate this. As I mentioned in the introduction of this section, this case scale is not specific for Gothic, but it holds across languages (cf. see Pittner 1995 for Modern, Middle High and Old High German, Grosu 2003 for Ancient Greek and Daskalaki 2011 for Modern Greek).[3]

In the remainder of this chapter I show that headless relatives are not the only place where the case scale shows up. Instead, it appears with more syntactic phenomena. Moreover, exactly this scale is also reflected in morphology.

2.2 In syntax

In this section I discuss two additional syntactic phenomena that reflect the NOM < ACC < DAT scale. The first one is an implicational hierarchy that concerns agreement. The second one is an implicational hierarchy about relativization.

[3]These languages differ from Gothic in that they are subject to an additional constraint. That is, they only allow either the internal or the external case to win case competitions. If the other case is more to the right on the case scale (9), the result is ungrammatical. Old High German is an example of a language that only allows the external case to win the case competition. If the internal case is more to the right on the case scale, the headless relative is ungrammatical. Modern German is an example of a language that only allows the internal case to win the case competition. If the external case is more to the right on the case scale, the headless relative is ungrammatical. This topic is the main focus of Part I of this dissertation.

2.2.1 Agreement

Agreement can be seen as "a systematic covariance between a semantic or formal property of one element and a formal property of another" (Steel, 1978). Put differently, the shape of one element changes according to some properties of an element it relates to. In this section I discuss the agreement between a predicate and its arguments.

It differs per language with how many of its arguments a predicate agrees. However, it is not random with which agreement takes place. Instead, there is an implicational hierarchy that is identical to the one observed for headless relatives: NOM < ACC < DAT.

Moravcsik (1978) formulated the implicational hierarchy in terms of grammatical functions subject, direct object and indirect object.[4] The hierarchy is schematically represented in Figure 2.1. It should be read as follows: if a language allows the predicate to agree with the argument in a particular circle, it also allows the predicate to agree with the argument in the circle around it.

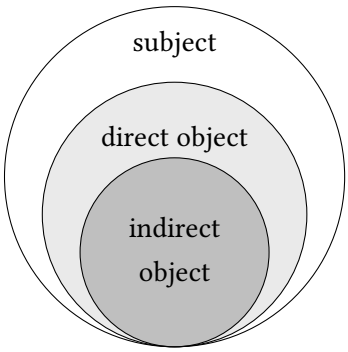

Figure 2.1: Moravcsik's 1978 schema

Then, there are four types of languages possible: first, a language that does not show any agreement; second, a language that shows agreement only with the subject and not with the direct and indirect object; third, a language that shows agreement with the subject and direct object but not with the indirect object; and

[4] Moravcsik (1978) also included adverbs on the lowest end of the hierarchy. I leave them out here, because they are not relevant for the discussion.

fourth, a language that shows agreement with the subject, the direct object and the indirect object.

The implicational hierarchy holds for languages, not for sentences. That is, it is not the case that in a language of a particular type all instances of the grammatical function show agreement. To be more precise, in a language of the second type, that only shows agreement with the subject, not all subjects have to show agreement. Particular types of subject, such as experiencer subjects often do not show any agreement.

Japanese is an example of a language that does not show any agreement on the predicate. An example is given in (10). The predicate *okutta* 'sent' does not agree with the subject *Tarooga* 'Taro', with the direct object *nimotuo* 'package' or with the indirect object *Hanakoni* 'Hanako'.

(10) Taroo-ga Hanako-ni nimotu-o okutta.
Taro-NOM Hanako-DAT package-ACC sent
'Taro sent Hanako a package.' (Japanese, Miyagawa and Tsujioka 2004: 5)

German is an example of a language that shows agreement with the subject of the clause. An example is given in (11). The predicate *gibst* 'give' contains the morpheme *-st*, marked in bold. This morpheme is the agreement morpheme for second person singular subjects (in the present tense). The predicate *gibst* 'give' agrees in person and number with the subject *du* 'you'. There is no agreement with the direct object *das Buch* 'the book' or the indirect object *mir* 'me'.

(11) Du gib **-st** mir das Buch.
you give -2SG.PRES me the book
'You give me the book.' (German)

Hungarian is an example of a language that shows agreement with the subject and the direct object of a clause. An example is given in (12). The predicate *adom* 'give' contains the morpheme *-om*, marked in bold. This is a portmonteau morpheme for a first person singular subject and a third person object agreement. The predicate *adom* 'give' agrees with the subject *én* 'I' and the direct object *a könyvet* 'the book'. There is no agreement with the indirect object *neked* 'you'. Agreement with the the

first person singular subject *én* 'I' and second person singular indirect object *neked* 'you.DAT.SG' is ungrammatical, as indicated by the ungrammaticality of *-lak*.

(12) (Én) neked ad **-om**/ *-lak a könyv -et
I you.DAT.SG give -1SG.SUBJ>3.OBJ -1SG.SUBJ>2.OBJ the book -ACC
'I give you the book.' (Hungarian, András Bárány p.c.)

Basque is an example of a language that shows agreement with the subject, the direct object and the indirect object. Basque is an ergative-absolutive language, so in transitive clauses subjects are marked as ergative and objects are marked as absolutive. An example from the Bizkaian dialect is given in (13). The stem of the auxiliary *aus* combines with the morphemes *d-*, *-ta* and *-zu*, marked in bold. The morpheme *d-* is the agreement morpheme for third person singular as direct objects, which is here *liburua* 'the book'. The morpheme *-ta* is the agreement morpheme for first person singular indirect objects, which is here *niri* 'me'. The morpheme *-zu* is the agreement morpheme for second person singular ergative subjects, which is here *zuk* 'you'.

(13) Zu-k ni-ri liburu-a emon **d** -aus **-ta** **-zu**.
you-ERG me-DAT book-DEF.ABS given ABS.3SG -AUX -DAT.1SG -ERG.2SG
'You gave me the book.'
(Bizkaian Basque, adapted from Arregi and Molina-Azaola 2004: 45)

Putting the languages in Moravcsik's (1978) figure gives the following result.

Gilligan (1987) performed a typological study among 100 genetically and areally diverse languages, which confirms the picture. The results are shown in Table 2.3. There are 23 languages that do not show any agreement, like Japanese. There are 31 languages that show agreement only with the subject and not with the direct and indirect object, like German. There are 25 languages that show agreement with the subject and direct object but not with the indirect object, like Hungarian. There are 23 languages that show agreement with the subject, the direct object and the indirect object, like Basque.

It is often the case that subjects appear in nominative case, and that direct objects appear in accusative. However, this is not always the case. Subjects can be non-

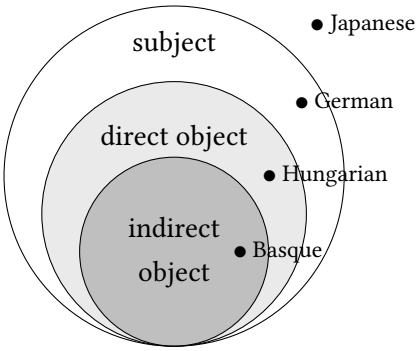

Figure 2.2: Moravcsik's 1978 schema with languages

Table 2.3: Agreement accessibility

agreement with				
subject	direct object	indirect object	number of languages	example
*	*	*	23	Japanese
✓	*	*	31	German
✓	✓	*	25	Hungarian
✓	✓	✓	23	Basque
✓	*	✓	(1)	-
*	✓	✓	0	-
*	x	*	0	-
*	*	✓	0	-

nominative and direct objects can be non-accusative. Bobaljik (2006) argues that the implicational hierarchy is more accurate if it is stated in terms of case rather than grammatical function. He argues for the picture shown in (13).[5]

[5]Actually, Bobaljik (2006) also includes ergative-absolutive languages, and argues for the picture in Figure 2.3. Default case can be nominative or absolutive case (in transitive clauses), and dependent

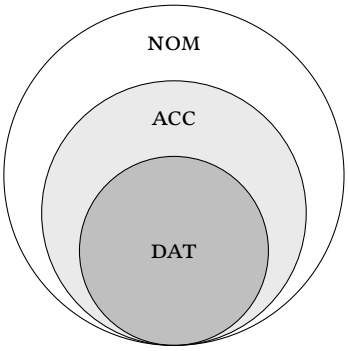

Figure 2.4: Bobaljik's 2006 simplified schema

Bobaljik gives examples of situations in which grammatical function and morphological case do not match. In these situations, case seem to capture the facts for the implicational hierarchy, and grammatical function does not. I give two examples from Icelandic that illustrate this point.

Icelandic is a language that has dative subjects. If agreement takes place with the grammatical subject, it is expected that the dative subject agrees with the predicate. This is not what happens, as illustrated in (14). The dative subject *morgum*

case can be accusative and ergative case.

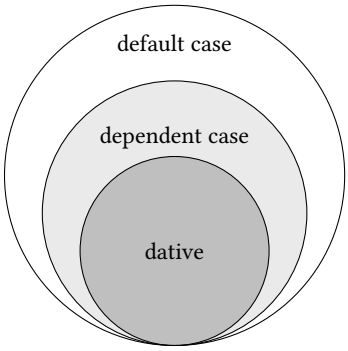

Figure 2.3: Bobaljik's 2006 actual schema

In the languages I discuss in this dissertation, I focus on languages that have nominative as default case and accusative as dependent case, so Figure (13) suffices.

studentum 'many students' is plural. The sentence is ungrammatical with the predicate *líka* 'like' inflecting for plural as well. So, the dative subject does not agree in number with the predicate. In other words, it is not the grammatical subject that shows agreement.

(14) *Morgum studentum líka verkið.
many students.DAT like.PL job.NOM
'Many students like the job.' (Harley 1995: 208)

Instead, it is the nominative object that agrees with the verb. This is illustrated in (15). The dative subject *konunginum* 'the king' is singular. The nominative object *ambáttir* 'slaves' is plural. The predicate *voru* 'were' is inflected for plural, agreeing with the nominative object. This is expected if morphological case determines agreement: it is the nominative that shows agreement. The grammatical role, the fact that this nominative is an object, does not influence agreement.

(15) Um veturinn voru konunginum gefnar ambáttir
In the.winter were.PL the.king.DAT given slaves.NOM
'In the winter, the king was given (female) slaves.'
(Zaenen, Maling, and Thráinsson 1985: 112)

In conclusion, agreement follows the same implicational hierarchy as the case scale in headless relatives: NOM < ACC < DAT.

2.2.2 Relativization

Relativization refers to the process in which a relative clause is derived from a non-relative clause. An example of the non-relative clause is given in (16a). The relative clause derived from that is shown in (16b). The head of the relative clause is *woman* and precedes the clause. The relative pronoun follows the head. The head of the head does not appear in the relative clause anymore.

(16) a. You like the woman.
b. **the woman**, who you like

In (16b), it is the object of the clause that is relativized. It differs per language which elements can be relativized with a particular strategy. Just like the distribution was not random for agreement, it is not random which elements can be relativized. Instead, there is an implicational hierarchy that is identical to the one observed for the case scale: NOM < ACC < DAT.

Keenan and Comrie (1977) formulated the implicational hierarchy in terms of the grammatical functions subject, direct object and indirect object.[6] The implicational hierarchy is schematically represented in Figure 2.5. It should be read as follows: if a language allows a particular relativization strategy of the grammatical function in a particular circle, it also allows this relativization strategy of the grammatical function of the circle around it. The languages in the figure give examples of the circles they are in.

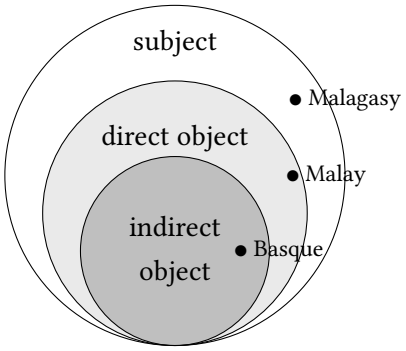

Figure 2.5: Schema for relativization

There are four types of languages possible: first, a language that allows only the subject to be relativized with a particular strategy and not the direct and indirect object; second, a language that allows the subject and direct object to be relativized with a particular strategy but not the indirect object; and third, a language that allows the subject, the direct object and the indirect object to be relativized with a particular strategy.

Malagasy is an example of a language that allows subjects to be relativized using a particular strategy, but not direct and indirect objects. (17) is an example of a

[6] Keenan and Comrie (1977) also included obliques, possessives and objects of comparison on the lowest end of the hierarchy. I leave them out here, because they are not relevant for the discussion.

declarative sentence in Malagasy. It is a transitive sentence that contains the subject *ny mpianatra* 'the student' and the direct object *ny vehivavy* 'the woman'.

(17) Nahita ny vehivavy ny mpianatra.
saw the woman the student
'The student saw the woman.' (Malagasy, Keenan and Comrie 1977: 70)

In (18), the subject from the declarative sentence, marked in bold, is relativized. The subject *ny mpianatra* 'the student' appears in the first position of the clause. It is followed by the invariable relativizer *izay* 'that'. After that, the rest of the relative clause follows, in this case *nahita ny vehivavy* 'saw the woman'.

(18) **ny mpianatra** izay nahita ny vehivavy
the student that saw the woman
'the student that saw the woman'
(Malagasy, Keenan and Comrie 1977: 70, my boldfacing)

The object of (17) cannot be relativized in the same way, as shown in (19). Here the object *ny vehivavy* 'the woman', marked in bold, appears in the first position of the clause. It is again followed by the relativizer *izay* 'that' and the rest of the relative clause, which is here *nahita ny mpianatra* 'saw the student'. This example is ungrammatical.

(19) *__ny vehivavy__ izay nahita ny mpianatra
the woman that saw the student
'the woman that the student saw'
(Malagasy, Keenan and Comrie 1977: 70, my boldfacing)

Later in this section I draw the parallel between subject and nominative, direct object and accusative and indirect object and dative (after Caha, 2009). As Malagasy does not have any overt morphological system, it does not hold that the subject corresponds to the nominative in this case. German is another example of a language that allows subjects to be relativized using a particular strategy, but not direct and indirect object. This strategy is the participle construction (Keenan and Comrie, 1977). This strategy is a secondary strategy that exist besides the main strategy that

can be used to relativize direct and indirect objects. (20) is an example of a declarative sentence in German. It is a transitive sentence that contains the subject *die Frau* 'the woman' and the object *der Mann* 'the man'.

(20) Die Frau küsst den Mann.
the woman kisses the man
'The woman is kissing the man.' (German)

The subject from the declarative in (20), sentence *die Frau* 'the woman', is relativized in (21). The predicate from the declarative clause *küsst* 'kisses' is turned in into the participle *küssende* 'kissing'. The participle appears at the end of the reduced relative clause *den Mann küssende* 'the man kissing'. The reduced relative clause directly precedes the noun of the subject, creating distance between the determiner *die* 'the' and *Frau* 'woman', which are both marked in bold.

(21) **die** den Mann küssende **Frau**
the the man kissing woman
'the woman who is kissing the man' (German)

The object from the declarative sentence in (20), *den Mann* 'the man', cannot be relativized like the subject, as shown in (22). Again, the predicate from the declarative clause *küsst* 'kisses' is turned in into the participle *küssende* 'kissing'. The participle appears at the end of the relative clause *die Frau küssende* 'the woman kissing'. The reduced relative clause directly precedes the noun of the object, creating distance between the determiner *der* 'the' and *Mann* 'man', which are both marked in bold. This example is ungrammatical.

(22) *__den__ die Frau küssende **Mann**
the the woman kissing man
intended: 'the man that the woman is kissing' (German)

Malay is an example of a language that has a relativization strategy for subjects and direct objects, but not for indirect objects. (23) shows an example in which the object is relativized. The object here is *ayam* 'chicken', marked in bold. It is followed by the relativizer *yang* 'that'. After that, the rest of the relative clause

Aminah sedang memakan 'Aminah is eating' follows. The same strategy works to relativize subjects, which is not illustrated with an example.

(23) Ali bunoh **ayam** yang Aminah sedang memakan.
Ali kill chicken that Aminah PROG eat
'Ali killed the chicken that Aminah is eating.'
(Malay, Keenan and Comrie 1977: 71, my boldfacing)

Indirect objects cannot be relativized using the same strategy. (24) is an example of a ditransitive sentence in Malay. The indirect object *kapada perempuan itu* 'to the woman' cannot be relativized using *yang*.

(24) Ali beri ubi kentang itu kapada perempuan itu.
Ali give potato the to woman the
'Ali gave the potato to the woman.' (Malay, Keenan and Comrie 1977: 71)

This is illustrated by the examples in (25). In (25a), the direct object *perempuan kapada* 'to the woman', marked in bold, appears in the first position of the clause. It is followed by the relativizer *yang* 'that' and the rest of the relative clause *Ali beri ubi kentang itu kapada* 'Ali gave the potato to'. This example in ungrammatical. The example in (25b) differs from (25a) in that the preposition *kapada* 'to' has been moved such that it precedes the relativizer *yang* 'that'. This example is ungrammatical as well, indicating this was not the reason for the ungrammaticality.

(25) a. ***perempuan** yang Ali beri ubi kentang itu kapada
woman that Ali give potato the to
b. ***perempuan kapada** yang Ali beri ubi kentang itu
woman to who Ali give potato that
(Malay, Keenan and Comrie 1977: 71, my boldfacing)

Basque is an example of a language that has a particular relativization strategy for subjects, direct objects and indirect objects. (26) is an example of a declarative ditransitive sentence in Basque. The sentence contains the subject *gizonak* 'the man', the direct object *liburua* 'the book' and the indirect object *emakumeari* 'the woman'.

(26) Gizon-a-k emakume-a-ri liburu-a eman dio.
man-DEF-ERG woman-DEF-DAT book-DEF.ABS give has
'The man has given the book to the woman.'
(Basque, Keenan and Comrie 1977: 72)

A relative clause in Basque appears in the prenominal position and it is marked by the invariable marker *-n*.[7] (27a) shows the three relativizations that are derived from (26). In (27a), the ergative subject *gizonak* 'the man' from (26) is relativized. The head *gizona* 'the man', marked in bold, has lost its ergative marker *-k*, and follows the relative clause *makumeari liburua eman dio* 'who has given the book to the woman'. The suffix *-n* is attached to the relative clause. In (27b), the absolutive direct object *liburua* 'the book' from (26) is relativized. The head *liburua* 'the book', marked in bold, follows the relative clause *gizonak emakumeari eman dion* 'that the man has given to the woman'.[8] The suffix *-n* is attached to the relative clause. In (27c), the dative indirect object *emakumeari* 'the woman' from (26) is relativized. The head *emakumea* 'the man', marked in bold, has lost its dative marker *-ri*, and follows the relative clause *gizonak liburua eman dion* 'that the man has given the book to'. The suffix *-n* is attached to the relative clause.

(27) a. emakume-a-ri liburu-a eman dio-n **gizon-a**
woman-DEF-DAT book-DEF.ABS give has-REL man-DEF
'the man who has given the book to the woman'
b. gizon-a-k emakume-a-ri eman dio-n **liburu-a**
man-DEF-ERG woman-DEF-DAT give has-REL book-DEF
'the book that the man has given to the woman'
c. gizon-a-k liburu-a eman dio-n **emakume-a**
man-DEF-ERG book-DEF.ABS give has-REL woman-DEF
'the woman that the man has given the book to'
(Basque, Keenan and Comrie 1977: 72, my boldfacing)

[7] Additionally, the relativized positions do not appear in verbal agreement anymore, but this not visible in the example, because they are all phonologically zero.

[8] The absolutive direct object *liburua* 'the book' does not have an additional overt absolutive marker, so this difference cannot be observed when it is relativized.

Caha (2009) restates the implicational hierarchy in terms of case. Subject corresponds to nominative, direct object corresponds to accusative, and indirect object corresponds to dative. Again, the case scale NOM < ACC < DAT can be observed.

2.3 In morphology

In the two previous sections I showed that the case scale NOM < ACC < DAT can be observed in three syntactic phenomena. First, it shows up in case competition in headless relatives. Second, the case scale forms the basis for the implicational hierarchy observed in agreement across languages. Third, the identical implicational holds for relativization strategies cross-linguistically.

In this section, I show that this same case scale also shows up in morphology. First, syncretism only targets continuous regions on the case scale. Second, several languages show formal containment that mirrors the case scale.

2.3.1 Syncretism

Syncretism refers to the phenomenon whereby two or more different functions are fulfilled by a single form (cf. Baerman, Brown, and Corbett, 2002). In this section I discuss literature that shows that syncretism patterns among nominative, accusative and dative are not random. Instead, they pattern along the case scale NOM < ACC < DAT.

It has widely been observed that syncretism is restricted by the linear sequence NOM — ACC — DAT (Baerman, Brown, and Corbett, 2005; Caha, 2009; Zompì, 2017) (and see McFadden 2018; Smith et al. 2019 for similar claims concerning root suppletion). That is, if one orders cases in this linear sequence, only contiguous regions in the sequence turn out to be syncretic. Following that, four possible patterns are attested crosslinguistically. First, all three cases are syncretic. Second, nominative and accusative are syncretic and the dative is not. Third, the accusative and the dative are syncretic and the nominative is not. Fourth, all cases are non-syncretic.

There is one pattern that is not attested crosslinguistically. This pattern does not target continuous regions, but non-contiguous ones: nominative and dative are

syncretic and accusative is not. In other words, there is no ABA pattern (in which a form B intervenes between the two identically formed As) (Bobaljik, 2012).

Table 2.4 shows examples for each of these possible patterns. I give an example from a syncretism between nominative, accusative and dative from Dutch. The second person plural pronoun is *jullie* 'you.PL' is syncretic between nominative, accusative and dative. I give an example from a syncretism between nominative and accusative but not dative from German. The third person singular feminine *sie* 'she/her' is syncretic between nominative and accusative. The dative has a separate form: *ihr* 'her'. I give an example from a syncretism between accusative and dative but not nominative from Icelandic. The first person singular plural is *okkur* 'us' is syncretic between accusative and dative. The nominative has a separate form: *við* 'we' (Einarsson 1949: 68). I give an example from three distinct forms from Faroese. The second person singular is *tú* 'you' for nominative, *teg* 'you' for accusative and *tær* 'you' for dative (Lockwood 1977: 70). Crucially, to the best of my knowledge, there is no language in which the nominative and the dative are syncretic but the accusative is not.

Table 2.4: Syncretism in NOM — ACC — DAT

pattern			NOM	ACC	DAT	translation	language
A	A	A	jullie	jullie	jullie	2PL	Dutch
A	A	B	sie	sie	ihr	3SG.F	German
A	B	B	við	okkur	okkur	1PL	Icelandic
A	B	C	tú	teg	tær	2SG	Faroese
A	B	A					not attested

In sum, case syncretism follows the ordering of the case scale in headless relatives: NOM < ACC < DAT.

2.3.2 Formal containment

This section shows a second way in which NOM < ACC < DAT is reflected in morphology: formal containment (cf. Caha, 2010; Zompì, 2017; Smith et al., 2019). In some

languages, the form that is used for the accusative literally contains the form that is used for the nominative. In turn, the forms for the dative contains the form for the accusative. I illustrate this phenomenon with examples from Khanty.

Khanty (or Ostyak) shows formal containment in some of its pronouns (Nikolaeva 1999: 16 after Smith et al. 2019). Three examples are given in Table 2.5.

The nominative form for the first person singular is *ma* 'I.NOM'. The form for the accusative is *ma:ne:m* 'me'. This is the form for the nominative *ma* plus the accusative marker *-ne:m*. The form for the dative is *ma:ne:mna* 'me'. This is the form for the accusative *ma:ne:m* plus the dative marker *-na*. So, dative formally contains the accusative, and the accusative formally contains the nominative.

The third person singular and first person plural show the same pattern. The accusative forms *luwe:l* 'him/her' and *muŋe:w* 'us' contain the nominative forms *luw* and the *muŋ* plus the accusative marker *-e:l* or *-e:w*. The dative forms *luwe:lna* 'him/her' and *muŋe:wna* 'us' contain the accusative forms *luwe:l* and *muŋe:w* plus the dative marker *-na*. Again, the dative formally contains the accusative, which in turn contains the nominative.

Table 2.5: Case containment in Khanty

	1SG	3SG	1PL
NOM	ma	luw	muŋ
ACC	ma:**-ne:m**	luw**-e:l**	muŋ**-e:w**
DAT	ma:**-ne:m**-na	luw**-e:l**-na	muŋ**-e:w**-na

Other languages that show this phenomenon are West Tocharian (Gippert, 1987) and Vlakh and Kalderaš Romani (respectively Friedman 1991 and Boretzky 1994).

In sum, some languages morphologically look like NOM-ACC-DAT. This exactly reflects the case scale NOM < ACC < DAT.

2.4 Summary

Case competition in headless relatives adheres to the case scale in (28). If the internal and external case differ, cases more on the right of the scale win over cases more to

the left on the case.

(28) NOM < ACC < DAT

This case scale is not only found in case competition in headless relatives. Implicational hierarchies regarding two syntactic phenomena appear across languages. The first one concerns agreement. If a language shows agreement with datives, it also shows agreement with accusatives and nominatives. If a language shows agreement with accusatives, it also shows agreement with nominatives. The second implicational hierarchy concerns relativization. If a dative in a language can be relativized with a particular strategy, an accusative and a nominative can be too using the same strategy. If an accusative can be relativized with a particular strategy, so can a nominative with this strategy.

The case scale also shows up in morphological patterns. First, if the cases are ordered according to the case scale, syncretism only target continuous forms, no ABA pattern appears. Second, some languages show how the dative formally contains accusative, and how the accusative formally contains the nominative.

These phenomena show that the pattern observed in headless relatives is not something that stands on itself. The scale is a pattern that recurs across languages and across different phenomena. Therefore, it should not be treated as an special process with its own stipulated rule. Instead, it is something general that should also follow from general processes in languages.

The next chapter shows how features of the nominative, accusative and dative are organized. All facts presented in this chapter can be derived from the organization of these features.

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RESEARCH

Mismatches in free relatives – grafting nanosyntactic trees

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German free relative constructions allow for case requirement mismatches under two types of circumstances. The first is when the case required in the embedded clause is more complex (NOM < ACC < GEN < DAT) than the case required in the main clause, and the relative pronoun takes the form of the embedded clause case. The second type of circumstance is when the form that corresponds to the two required cases is syncretic. I propose an analysis that combines Caha's (2009) case hierarchy in Nanosyntax with Van Riemsdijk's (2006a) concept of Grafting. By placing case features as separate heads in the syntax, a less complex case can be Grafted into a different clause, explaining the first type of circumstance. The second type makes reference to the fact that syncretic forms are inserted via the same lexical entry (Superset Principle). A cross-linguistic comparison shows that it is language-specific whether a more complex case requirement in the main or embedded clause causes non-matching non-syncretic free relatives to be grammatical. For all languages it holds that the relative pronoun appears in the most complex case required, which provides additional evidence for case being complex and more complex cases being able to license less complex cases.

Keywords: free relatives; syncretism; case hierarchy; nanosyntax; grafting

1 Introduction

A free relative construction is a type of relative clause that occurs without an antecedent. In the headed relative clause in (1a), the antecedent of the relative pronoun *den* 'who.ACC' is the homophonous demonstrative pronoun *den* 'the.ACC'. In (1b), the free relative counterpart of (1a), the relative pronoun *wen* 'who.ACC' does not have an antecedent.[1,2]

(1) a. Ich mag den, den ich eingeladen habe.
I like$_{acc}$ the.ACC who.ACC I invited$_{acc}$ have
'I like the one, who I have invited.'

b. Vogel (2001: 344)
Ich lade ein, wen auch Maria mag.
I invite$_{acc}$ who.ACC also Maria likes$_{acc}$
'I invite whoever Maria also likes.'

The German data and the description of the generalizations about the German data in this paper originate in Vogel (2001). (1b) is an example of a matching free relative. Both *lade*

[1] All examples in the paper are from German, unless indicated differently.
[2] The annotation of case on the verb indicates the case that the verb requires the free relative pronoun to be in, e.g. *acc* on *like* in (1b) indicates that *like* requires its object to be in accusative case.

ein 'invite' in the main clause and *mag* 'likes' in the embedded clause require their object to be in accusative. *Wen* 'who.ACC' satisfies both these accusative case requirements.[3]

In German free relatives, the case requirements in both clauses do not need to match: mismatching free relatives are permitted under particular circumstances. The first type of circumstance is when the case required in the embedded clause is more complex (or more oblique) than the case required in the main clause (according to the complexity scale NOM < ACC < GEN < DAT < …). Additionally, the relative pronoun has to surface in the more complex case (cf. Pittner 1991; 1995; Vogel 2001; Grosu 2003). I illustrate this in (2) and (3) below. The examples in (2a) and (2b) only differ in the relative pronoun that is used. The predicate *vertraut* 'trusts' in the embedded clause requires its object to be in dative, and *lade ein* 'invite' in the main clause requires it to be in accusative. German has two distinct forms for accusative and dative to denote *who*: *wen* 'who.ACC' and *wem* 'who.DAT' respectively. The sentence is grammatical as long as the (more complex) dative relative pronoun *wem* 'who.DAT' is used, as shown in (2a). (2b) shows that the construction is ungrammatical if the accusative relative pronoun *wen* 'who.ACC'is used.[4,5]

(2) Vogel (2001: 344)

a. Ich lade ein, wem auch Maria vertraut.
I invite$_{acc}$ who.DAT also Maria trusts$_{dat}$
'I invite whoever Maria also trusts.'

b. *Ich lade ein, wen auch Maria vertraut.
I invite$_{acc}$ who.ACC also Maria trusts$_{dat}$
'I invite whoever Maria also trusts.'

In (3) the case requirements are reversed: the embedded clause predicate *mag* 'likes' requires its object to be in accusative and the one in the main clause *vertraue* 'trust' requires it to be in dative. This means that the case required in the embedded clause is less complex than the case required in the main clause. The sentences in (3) are ungrammatical, independent of which relative pronoun (*wen* 'who.ACC' or *wem* 'who.DAT') is used.

(3) Vogel (2001: 345)

a. *Ich vertraue, wen auch Maria mag.
I trust$_{dat}$ who.ACC also Maria likes$_{acc}$
'I trust whoever Maria also likes.'

b. *Ich vertraue, wem auch Maria mag.
I trust$_{dat}$ who.DAT also Maria likes$_{acc}$
'I trust whoever Maria also likes.'

The pattern observed here does not only appear with accusative – dative case combinations. As long as the embedded clause requires a more complex case than the main clause, and the more complex relative pronoun is used, a mismatching free relative is grammatical. If the embedded clause requires a less complex case than the main clause, the result

[3] Matching free relatives in German do not only exist with accusative – accusative pairs, but also with double nominative, genitive and dative case requirements.

[4] In Polish (Citko 2013), and in some varieties of German (Vogel 2001), mismatches with distinct lexical entries are never permitted, and (2a) is ungrammatical. Presumably these speakers require a stricter form of matching. I return to this point in Section 5.2.

[5] Other languages that show (different types of) hierarchy effects are Gothic (Harbert 1982) and Modern Greek (Daskalaki 2011), to which I return to in Section 5.2.

is ungrammatical. For example, if the embedded clause requires a genitive case, the main clause can have either an accusative or a genitive case requirement. What follows is that German does not have mismatching free relatives with the embedded clause requiring a nominative, because nominative is the least complex case. For the relevant examples, see the Appendix. In this paper, I illustrate my proposal using the accusative – dative case examples, but the analysis carries over to the other case combinations.

The second type of circumstance in which mismatching free relatives are permitted is when the phonological form that corresponds to two cases is syncretic, and the syncretism resolves the mismatch (cf. Groos & van Riemsdijk 1981; Dyta 1984; Zaenen & Karttunen 1984; Pullum & Zwicky 1986; Ingria 1990; Dalrymple & Kaplan 2000; Sag 2003). In (4), the case required in the embedded clause is less complex than the case required in the main clause. The example in (4) is grammatical, although it also has the less complex case required in the embedded clause, just like the ungrammatical example in (3). The crucial difference between (3) and (4) is that the latter has a syncretic form that corresponds to the two cases, and the former does not. *Gefällt* 'pleases' in the embedded clause requires a nominative subject, and *erzähle* 'tell' requires its object to be in accusative. *Was* 'what.NOM/ACC' is syncretic between both nominative and accusative; it has the same phonological form in both cases. Therefore, it is able to satisfy both the nominative and accusative case requirements, and the sentence is grammatical.

(4) Vogel (2001: 344)
Ich erzähle, was immer mir gefällt.
I tell$_{acc}$ what.NOM/ACC ever me pleases$_{nom}$
'I tell whatever pleases me.'

For completeness, I give an example of a free relative with a syncretic form and the less complex case required in the embedded clause, which is also grammatical. In (5), the embedded clause predicate *weiß* 'know' requires its object to be in accusative, and *macht* 'makes' requires a nominative subject. *Was* 'what.NOM/ACC' is able to satisfy both the nominative and accusative case requirements.

(5) Vogel (2001: 363)
Was ich nicht weiß, macht mich nicht heiß.
what.NOM/ACC I not know$_{acc}$ makes$_{nom}$ me not hot
'What I don't know doesn't excite me.'

Unlike the German-specific effect in (2a), resolving a case mismatch by syncretism is not specific to German. (6) gives three examples from different Slavic languages that show the same effect. In (6a), the Russian *kogo* 'who.ACC/GEN' satisfies the accusative case requirement from *iskal* 'sought' and the genitive case requirement from *bylo* 'was'. (6b) shows a conversational Bulgarian example in which *kojto* 'who.NOM/ACC' is syncretic between nominative and accusative, and the accusative case requirement of *celuna* 'kiss' and the nominative one of *dojde* 'comes' are satisfied. The Polish *kogokolwiek* 'whoever.ACC/GEN' is both accusative and genitive, and satisfies the genitive case requirement from *unika* 'avoids' and the accusative case requirement of *obraził* 'offended'.

(6) a. *Russian* (Levy & Pollard 2002: 222)
Kogo ja iskal, ne bylo doma.
who.ACC/GEN I sought$_{acc}$ not was$_{gen}$ home
'Who I was looking for wasn't at home.'

b. *conversational Bulgarian* (Izvorski 1997: 279)
Šte celuna kojto dojde prâv.
will kiss$_{acc}$ who.NOM/ACC comes$_{nom}$ first
'I will kiss whoever comes first.'

c. *Polish* (Himmelreich 2017: 17 after Citko 2013)
Jan unika kogokolwiek wczoraj obraził
Jan avoids$_{gen}$ whoever.ACC/GEN yesterday offended$_{acc}$
'Jan avoided whoever he offended yesterday.'

A summary of the patterns discussed in this section is shown in Table 1. As long as the case required in the embedded clause is more complex, and the form corresponding to this more complex case is inserted, the free relative is grammatical (the left column). If the case required in the embedded clause is less complex, the phonological form starts to play a role. If German has two different forms for the different cases, the free relative is ungrammatical (see upper-right cell). It can be saved, however, if there is a single syncretic form that corresponds to the two required cases (see lower-right cell).

In lexicalist frameworks, the effect that a more complex case is required in the embedded clause was generally claimed to originate from the stipulation that more marked cases are able to license less marked cases (cf. Pittner 1995). The power of syncretism was mostly explained by underspecified lexical entries: the presyntactic lexicon contains phonological forms that are specified for more than one case (cf. Ingria 1990). Lately, theories of late insertion, such as Distributed Morphology (Halle & Marantz 1993), have become more prominent. At first sight, the fact that syncretism resolves mismatches is problematic for such approaches. If there is no presyntactic lexicon that contains phonology, it is unclear how phonological forms can influence grammaticality. Nevertheless, in recent years, the resolution of case mismatches has been accounted for using different theories within late insertion. Asarina (2011) provides an analysis that combines underspecified lexical entries in Distributed Morphology with multidominance. Her analysis of Russian can be extended to the syncretic cases in German, but does not capture the effect of requiring a more complex case in the embedded clause (which does not exist in Russian). Himmelreich (2017) proposes an agree-based account, which captures both the syncretic cases and the more and less complex cases. However, she needs two different mechanisms to derive the effects. In this paper, I provide a unified analysis that accounts for both types of circumstances in which mismatching free relatives are permitted, crucially drawing on case containment (Caha 2009). This paper provides further evidence that case is internally complex, a more complex case can license a less complex case, and that syntactic structure can be shared between clauses.

The paper is organized as follows. Section 2 presents the internal structure I assume for the free relative pronoun. I introduce the Nanosyntactic (Starke 2009) tools for the analysis, the projections within the relative pronoun, and I show how a relative pronoun is formed in a derivation. One of the projections within the relative pronoun is the KP (case phrase), which contains the case hierarchy (Caha 2009) which is crucial for

Table 1: Grammaticality pattern of German mismatching free relatives.

	case in embedded clause	
	more complex	less complex
distinct forms	✓	*
syncretism	✓	✓

the analysis in Section 4. Section 3 discusses the external syntax of a free relative construction. A free relative pronoun is associated with two syntactic positions, which can be analyzed by a Grafting operation (Van Riemsdijk 2006a): embedded features in one structure can be remerged into a different structure. In Section 4, I present the analysis as a three step derivation. In the first step, the embedded clause predicate combines with the required case node on the relative pronoun. In the second step, the relative pronoun moves to the left edge of the clause. In the third step, the main clause predicate combines with the case node it requires. If this case node is not available, the highest case node combines with more complex case nodes first, until the main clause predicate can be merged. German is subject to the restriction that only case features that have the same spellout can be added. This restriction makes a crucial distinction between syncretic and non-syncretic mismatching free relatives. Section 5 extends the proposal to three other languages besides German by identifying two restrictions which can be present or absent in a language. Section 6 concludes.

2 Internal syntax of free relatives

In this section I make explicit what I assume to be the internal syntax of free relative pronouns. I argue that free relative pronouns consist of a combination of the element *w-* and an element which expresses different mass type and case distinctions. First, I introduce the basic concepts from Nanosyntax that allow for a discussion, and I discuss the feature make-up of the different projections. Towards the end of the section, I show how the lexical entries that I propose correspond to free relative pronouns as they surface.

2.1 Nanosyntax

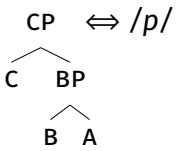
Nanosyntax (Caha 2009; Starke 2009; Baunaz & Lander 2018b) is a generative approach in which syntactic features correspond to their own terminal nodes and are merged into syntactic trees. Nanosyntax has a postsyntactic lexicon that consists of lexical trees which are linked to phonological and conceptual representations. Spellout in Nanosyntax is phrasal: instead of spelling out individual terminal nodes, lexical entries target phrasal (non-terminal) nodes in the syntactic tree. Spellout is also cyclic, and each successful spellout overrides all previous spellouts that it dominates (Principle of Cyclic Override Starke 2009: 4). After each instance of merge, the syntactic tree is spelled out. No parts of the syntactic structure can remain unlexicalized (known as Cyclic Exhaustive Lexicalization, Fábregas 2007). Spellout only takes place under strict constituenthood, i.e. only constituents can be targeted for spellout. The two principles in (7) govern lexical insertion.

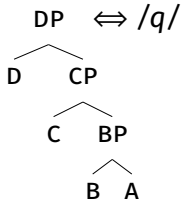
(7) a. **Superset Principle:** a lexically stored tree matches a syntactic node iff the lexically stored tree contains the syntactic node (Starke 2009: 3)
b. **Elsewhere Condition:** if several lexical items match the root node, the candidate with the least unused nodes wins (Starke 2009: 4)

The Superset Principle in (7a) ensures that a lexical tree matches a syntactic tree if the lexical tree is a superset (proper or not) of the syntactic tree. This means that a lexical tree can match a syntactic tree if the former contains features that the latter does not, but not vice versa. The Elsewhere Condition as in (7b) makes sure that, when more than one lexical tree can lexicalize the same syntactic tree (by the Superset Principle), the lexical tree with the least amount of superfluous material is chosen.

I illustrate with abstract examples how these principles together select a single lexical entry. In (9) to (11), the structure [DP[CP[BP]]] is created in three derivational steps

with lexicalizations after each step. (8) gives two abstract lexical entries.[6] The lexical tree [CP[BP]] corresponds to the phonological structure *p*, and the lexical tree [DP[CP[BP]]] corresponds to the phonological structure *q*.

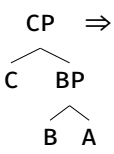
(8) a. 

b. 

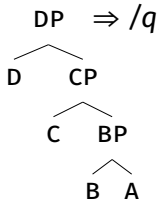
In the first step of the syntactic derivation, A is merged with B, creating BP in (9). Both the lexical trees [CP[BP]] in (8a) and [DP[CP[BP]]] in (8b) are a superset of BP (Superset Princple). [CP[BP]] has less superfluous material than [DP[CP[BP]]] (Elsewhere Condition), and therefore the phonological form *p* is inserted.

(9) 

Next, BP merges with C, and [CP[BP]] in (10) is created. Here again, both lexical trees [CP[BP]] in (8a) and [DP[CP[BP]]] in (8b) are a (proper) superset of the syntactic tree (Superset Principle). As [CP[BP]] has no superfluous material but [DP[CP[BP]]] does, the lexical entry (8a) matches with the syntactic structure via the Elsewhere Condition. In this example, [CP[BP]] and BP are syncretic: they correspond to the same lexical entry and have the same phonological form *p*.

(10) 

Finally, [CP[BP]] merges with D, as shown in (11). The lexical tree [CP[BP]] in (8a) is no longer a superset of the syntactic tree, as it does not contain D (Superset Principle), so it is not a candidate for a match. [DP[CP[BP]]] in (8b), however, still contains all features. The earlier spellout of (8a) is overridden by (8b) and the phonological structure *q* is inserted (Principle of Cyclic Override).

(11) 

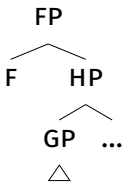
[6] Throughout the paper, ⇔ indicates the pairing between a lexical tree and a phonological form in a lexical entry, and ⇒ indicates how a node in the syntactic structure is spelled out.

The syntactic structures given above could all be spelled out after a new feature has been merged. However, this is not always the case. If there is no lexical tree that matches the syntactic tree after a new feature is merged, spellout driven movement takes place. Spell-out-driven movement is governed by the so-called spellout algorithm. There are several steps in the algorithm, of which I only discuss the first two in this paper (see for additional steps not required for this paper Baunaz & Lander 2018b; Starke 2018; Caha et al. 2019; De Clercq 2019).

The first step in this algorithm has already been used to illustrate the principles governing lexical insertion in (7). This step is called Stay: the syntactic structure stays as it is after the merge of a new feature, and the lexicon is checked for a lexical entry. If there is no lexical entry available that matches, the first movement possibility takes place. This is Cyclic: the leftmost daughter of the sister of the last added feature is moved to the left of the last added feature. The lexicon is consulted again after this movement.

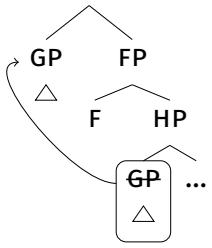
I illustrate the spellout algorithm with an abstract example in (12) to (13). I start with the first step: Stay. The structure stays at it is, and the lexicon is consulted for a lexical entry with the syntactic structure, shown in (12).

(12) Stay



If there is no lexical entry available for this configuration, then GP, the leftmost daughter of the sister of F, moves to the left of F (Cyclic). The lexicon is checked for an entry that contains the syntactic structure FP. This FP contains HP, but it does not have a GP in it, shown in (13).

(13) Cyclic



This kind of movement does not leave any traces (Baunaz & Lander 2018b; Starke 2018). In the next section, I discuss the internal feature make-up of the free relative pronouns. In Section 2.3, I apply the tools introduced in this section to show how the free relative pronouns are built.

2.2 The feature inventory

In this section I make my assumptions for the internal structure of German free relative pronouns explicit. An overview of the pronouns is given in Table 2.[7]

I follow a large body of literature that argues that pronouns have complex internal structure and that they correspond to phrases (cf. Cardinaletti 1994; Weerman & Evers-Vermeul

[7] For discussion on the incompleteness of the paradigm of *was*, see Hachem (2015: 162) and references therein.

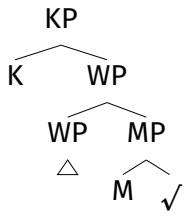
Table 2: German free relative pronouns.

	'who'	'what'
NOM	wer	was
ACC	wen	was
GEN	wessen	–
DAT	wem	–

2002; Boef 2013; Hachem 2015). Like Hachem (2015) and Baunaz & Lander (2018a), I decompose relative pronouns into smaller units. Looking at the paradigm, there is reason to assume that pronouns consist of a form *w-* and a form that expresses gender and case. Moreover, the latter form also appears on other elements that show gender and case distinctions, such as definite determiners and demonstratives (compare *d-er* 'the-M' and *w-er* 'what-M', *d-as* 'the-N' and *w-as* 'what-N'). Taking this formal identity seriously (like cf. Leu 2008; Hachem 2015), I assume that they are the same morphosyntactic object.

In my analysis, the internal structure of the free relative pronoun looks as in (14). Following Hachem (2015), I assume that the WP corresponds to the *w*-element. The case phrase (KP) contains the case features and will be split up further following Caha (2009). The mass phrase (MP) contains different types of mass (that correspond to the distinctions better known as different grammatical genders) (Hachem 2015). The MP and KP together correspond to a single phonological element. In the structure in (14), the KP and the MP do not form a constituent that can match a lexical tree. Spellout-driven movement (of the WP into the specifier of the KP) will ensure that KP and MP form a constituent, such that they can be spelled out together.

(14)



In the next sections, I discuss each of the projections in (14) in turn.

2.2.1 Case (KP)

Caha (2009) (building on Blake 1994) proposes that case features are organized in the functional sequence (fseq) given in (15).

(15) NOM — ACC — GEN — DAT — INS — COM

This hierarchy is not specific to Nanosyntax; it is motivated typologically (Blake 1994), and a version of it has been incorporated in work on Distributed Morphology (Smith et al. 2018).[8]

The evidence that Caha provides for the hierarchy comes from amongst others syncretisms in morphological case suffixes and case compounding. He proposes that case syncretism only targets contiguous regions (nodes that are adjacent) in the case hierarchy. Caha investigates possible syncretisms in the Russian noun system. Of all possibilities, 15

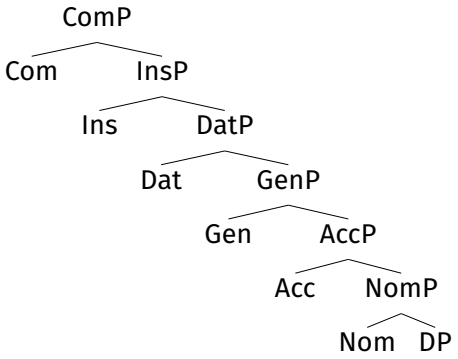
[8] There is some controversy about the positioning of the genitive in this ordering, as some languages (such as Icelandic, see Caha 2009: 273ff) point to an ACC — DAT — GEN ordering instead of ACC — GEN — DAT. Starke (2017) solves this problem by refining the case hierarchy, arguing that there are two types of accusative and dative, both above and below the genitive. As I do not discuss data with a genitive, I maintain the bare ordering in (15).

syncretisms are predicted to exist by the case hierarchy (because they target contiguous regions) and 42 are not (because they do not). 8 of the 15 predicted patterns occur in Russian. Not all 15 contiguous patterns arise because syncretism mostly covers only two contiguous elements and not 'long' stretches. Only one of the 42 non-contiguous patterns occurs, which can be explained as accidental homophony (Caha 2009: 13–14). Table 3 (Caha 2009: 12) shows some examples of nouns with syncretisms in their case suffixes that target contiguous regions.

As can be seen in Table 3, *-o* in *okno* 'window.NOM/ACC' is syncretic for nominative and accusative, *-ej* in *ucitelej* 'teachers.ACC/GEN' is syncretic between accusative and genitive, etcetera. Syncretism only targets contiguous regions, and no non-contiguous syncretisms exist, e.g. nominative and genitive to the exclusion of accusative.

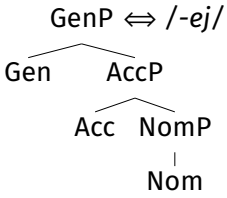
Working within Nanosyntax, Caha implements the case hierarchy in terms of syntactic structure, given in (16). The higher, more complex cases contain the smaller, less complex cases. A nominative consists of a DP merged with nominative features. An accusative consists of a DP merged with nominative and accusative features. The accusative contains, by definition, the nominative, and so forth.

(16)



In Nanosyntax, the syncretic forms in Table 3 involve lexical entries that can spell out multiple syntactic structures. For example, for *-ej* in *ucitelej* 'teachers.ACC/GEN', there is a single lexical entry that contains nominative, accusative and genitive features, as in (17).

(17)



If there is a genitive in the syntax, this lexical entry is selected, as the lexical tree exactly matches the syntactic tree. If there is an accusative in the syntax, the same lexical entry is chosen, as the lexical tree is a superset of the syntactic tree (via the Superset Principle),

Table 3: Case syncretisms in Russian.

	'window'	'teachers'	'two'	'book'	'100'
NOM	okn-**o**	ucitel-ja	dv-a	knig-a	st-o
ACC	okn-**o**	ucitel-**ej**	dv-a	knig-u	st-o
GEN	okn-a	ucitel-**ej**	dv-**ux**	knig-y	st-**a**
PREP	okn-e	ucitel-jax	dv-**ux**	knig-**e**	st-**a**
DAT	okn-u	ucitel-am	dv-um	knig-**e**	st-**a**
INS	okn-om	ucitel-ami	dv-umja	knig-oj	st-**a**

and there is no more specific lexical entry (Elsewhere Condition). The reason why *-ej* is not inserted as nominative is because there is a lexical entry only for the nominative, as given in (18).

(18) NomP ⟺ /*-ja*/
|
Nom

In Table 4, further evidence from case compounding is exemplified (Caha 2009: 69, after Gippert 1987).

As shown in (16), a genitive does not only contain genitive features, but also the accusative (and nominative). Table 4 shows that this containment relation is morphologically visible in West Tocharian: the genitive marker *ṃ-ts* formally contains the accusative marker *ṃ*.

When implemented in Nanosyntax, case compounding looks as follows. I give two lexical entries for West Tocharian in (19).

(19) a. AccP ⟺ /*-ṃ*/
|
Acc

b. DatP ⟺ /*-ts*/
Dat GenP
|
Gen

If a genitive is spelled out, it spells out all features up to the genitive (so also the accusative features). The accusative features are spelled by *ṃ* in (19a), and the genitive features are spelled out by *-ts* in (19b). It is crucial here that the lexical entry for the genitive and dative does not contain accusative features, so the phonological structure of the accusative is not canceled out by the Principle of Cyclic Override. Instead, both phonological structures in (19) are combined as *-ṃts*.

2.2.2 Mass types (MP)

In the previous section I discussed the y-axis of Table 2 (case). This section concerns the x-axis of the table, the choice between *wer* 'who' and *was* 'what'. In this paper, I follow Hachem (2015) who argues that the distinction between *wer* 'who' and *was* 'what' is one of 'mass type'. Parallel to the KP for case, I use the MP for mass type. Hachem proposes that mass type is the notion that should replace, at least for German and Dutch, what has been formerly known as grammatical gender. According to her, the morphological distinctions that can be seen are not semantically empty, but they are used to classify noun phrases into different types of mass. In her work, Hachem discusses so-called *d-* and *w*-elements in German and Dutch, such as *d-er* 'the/that' and *w-er* 'who'. She analyzes *-er* in *d-er* and *w-er* as the same morphosyntactic element. She lets this element combine with

Table 4: Case compounding West Tocharian.

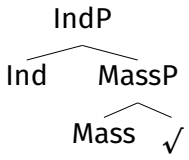
	'horses'	'men'
NOM	yakwi	eṅkwi
ACC	yakwe-**ṃ**	eṅkwe-**ṃ**
GEN/DAT	yäkwe-**ṃ**-ts	eṅkwe-**ṃ**-ts

d-, which denotes a definite interpretation, or *w-*, which introduces a set of alternatives. I return to the element *w-* in the next section. In this section I discuss the feature content of the elements that combine with *w-*: *-er* and *-as*.

Hachem (2015) argues that mass type distinctions provide a much better understanding of the nature of *w*-elements than gender distinctions. First, in terms of traditional gender distinctions, *-er* would be masculine gender and *-as* would be neuter. There is no principled reason for the absence of the feminine variant that could refer to a feminine antecedent. Second, gender distinctions do not shed any light on why *was* 'what' represents a general lack of information and *wer* 'who' refers only to humans (Hachem 2015: 164). Instead, Hachem (2015) introduces the idea that *-as* and *-er* denote different types of mass. The element *-as* (former neuter) expresses unbounded mass, which is defined as "homogeneous undifferentiated stuff without any certain shape or precise limits" (Koptjevskaja-Tamm 2004: 1067). The element *-er* (former masculine) refers to concentration/boundedness/individuative which "includes referents that have clear conceptual boundaries, such as natural objects, artifact, or body parts" (Audring 2009: 69). As the highest point on the individuation scale is a human, *wer* has a default interpretation as a set of human individuals. Answering the question "Who are you thinking about?" will always generate a set of human individuals. *Was*, on the other hand, refers to unboundedness, basically anything. An answer to the question "What are you thinking about?" can be anything: an activity, a state, but also a person. This indicates that 'what' and 'who' do not refer to inanimates and animates respectively, but that 'who' refers to a subset of what 'what' refers to. If the person who asked the question knows that the answer is going to be a person, it would be infelicitous to ask 'what' and instead 'who' should be used, because this is more specific.

Hachem (2015) merges a root (which includes encyclopedic knowledge, see Hachem 2015: 97–98) with unbounded mass features (into a MassP), and with individuative mass features (into an IndP), creating an fseq that looks as in (20).[9] The syntactic containment relation is reflected in the semantics: every individual is made up of mass (Hachem 2015: 108).

(20)



Hachem (2015) argues that the unbounded mass – individuative distinction is still reflected in Modern German in remnants of multiple gender assignment. A single noun can combine with multiple determiners of different mass types, rendering distinct meanings. An example is *das Erbe* 'the heritage' in which the definite determiner contains the unbounded mass type marker *-as*. It is a mass noun that denotes inherited property. *Der Erbe* 'the heir' has the definite determiner with an individuative mass type marker *-er*. It is a count noun that denotes the person that receives the heritage. See Hachem (2015) for more arguments for the fseq she proposes, which include amongst others how nouns in Indo-European combine with different gender suffixes.[10]

[9] Hachem (2015) actually places a CollP (denoting a collective) and a DivP (dividing the collective into individuals, making a plural) on top of the IndP. I only discuss the two lowest elements of the hierarchy, as only these two are relevant for this paper.

[10] Hachem (2015) points out that not all article-noun pairs exhibit the expected mass type, e.g. *das Haus* 'the house'. According to her, most article-noun pairs in German and Dutch are nowadays idioms, fixed expressions that need to be learned. See Hachem (2015: 130–132) for discussion.

I adopt Hachem (2015)'s terminology and refer to the syntactic node that spells out *-as* as MassP (unbounded mass) and the one that spells out *-er* as IndP (individuative), which always contains the MassP.

2.2.3 *W*-element (WP)

As I noted at the end of the previous section, Hachem (2015) proposes an account for German and Dutch *w-* and *d-* elements. Both *w-* and *d-* combine with the same morphosyntactic objects expressing mass type (and case) distinctions. In Hachem's work, *d-* is an element that is responsible for establishing a definite reference. The *w*-element, on the other hand, triggers the construction of a set of alternatives in the sense of Rooth (1985; 1992). This set of alternatives is restricted by whatever is in the complement of the WP (Hachem 2015: 180). For Hachem this is always the MP. This means that a *w*-item can refer to a set of alternative individuals (in the case of *wer* 'who') or a set of alternative unbounded masses in the case of *was* 'what'.[11] I do not discuss the internal structure of the WP, but I assume it is a complex element that contains more than a single feature.

Summing up, I split the KP up in different cases, according to the fseq in (16) (Caha 2009). I split the MP up in different types of mass, according to the fseq in (20) (Hachem 2015). Lastly, I assume that the WP introduces a set of alternatives, which is restricted by the KP that contains the MP.

2.3 The lexical entries

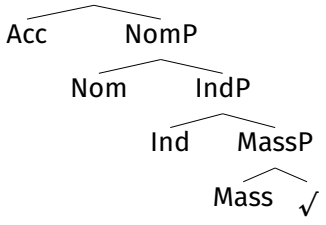
In the previous two sections, I presented Nanosyntactic lexical insertion and spellout-driven movements. I also discussed the fseqs of the KP and the MP, and I introduced the WP. In this section, I give the lexical entries that I use in this paper, and I illustrate the construction of a free relative pronoun in the course of a derivation.

I start with the WP. As already pointed out in the previous section, I follow Hachem (2015) in that the WP corresponds to *w-*. The lexical entry is given in (21).

(21) $\underset{\triangle}{\text{WP}} \Leftrightarrow$ /w-/

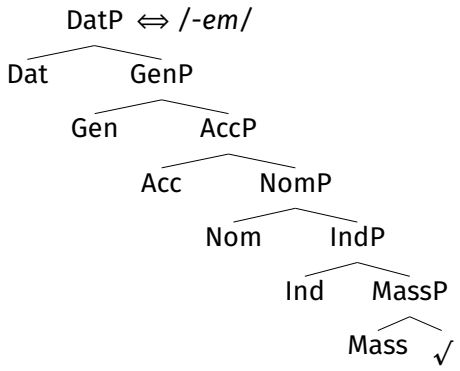
Throughout this paper I illustrate my proposal using examples with the relative pronouns *wen* 'who.ACC', *wem* 'who.DAT' and *was* 'what.NOM/ACC'. Therefore, I only give the lexical entries for *-en*, *-em* and *-as*. First, *-en* and *-em* express individuative mass, as they refer to individuals. Therefore their lexical entries contain mass type features up to the IndP. The relevant case features are built on top of the mass features. For *-en* this is the fseq up to the AccP. The lexical entry for *-em* also contains genitive and dative. The lexical entries for *-en* and *-em* are given in (22).

(22) a. AccP ⇔ /-en/



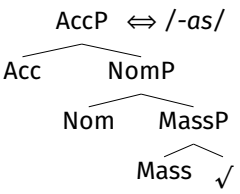
[11] I assume that the MP is a sister of the WP, as shown in (14). In the next section I show how the WP needs to be moved (via spellout driven movement) from its base position, such that the MP is not the sister of the WP anymore. Instead, the WP is a sister of KP, and the set of alternatives introduced by WP is restricted by the KP (which contains MP).

b.



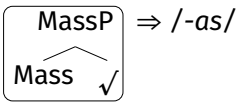
The marker *-as* expresses unbounded mass (i.e. basically anything) in nominative and accusative case. Specifying the lexical entry for accusative (which contains nominative) makes it possible to insert it in both contexts by means of the Superset Principle. The lexicon does not contain a lexical entry specifically for unbounded mass in nominative, so the lexical entry for unbounded mass in accusative in inserted.[12] I give the lexical entry in (23).

(23)



In (24) to (28) I give a step by step derivation of the creation of *was* 'what.NOM'. In the first step, the root is merged with Mass, creating MassP, shown in (24). The lexical entry that can be inserted is (23), since the lexical tree in (23) is a superset of the structure in (24), and it has less superfluous material than the entries for *-en* and *-em* (Stay).

(24)

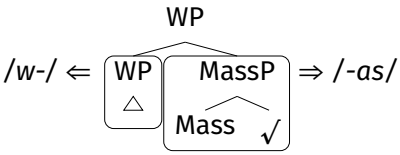


In a separate workspace, the WP is built, and spelled out as *w-*.

(25)

In the next step, the WP merges with the MassP, both having their own spellout.[13]

(26)

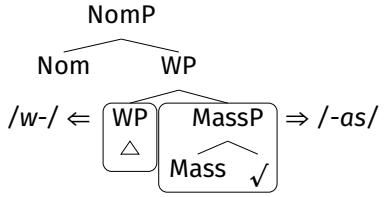


[12] The individuative mass type in nominative case (*-er*, with lexical tree [NomP[IndP[MassP[√]]]]) will not be inserted because trees are only allowed to shrink from the top.

[13] I assume the WP is created in a separate workspace and it merges as a complex specifier that projects. As the exact mechanics of how this happens are not relevant for the analysis in this paper, I do not discuss the details here. See cf. Caha et al. (2019); Starke (2018) for discussion.

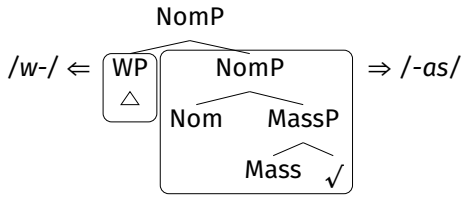
WP merges with Nom, resulting in the structure in (27).

(27)



No lexical entry exists for the structure as it is (Stay). There is no lexical entry for NomP that contains MassP with WP in its specifier. Following the spellout algorithm, the WP cyclically moves to the left of Nom (Cyclic), as shown in (28).

(28)



Now (23) matches the structure again, and MassP is spelled out as *-as*.

This concludes the section on the internal structure of free relative pronouns. In the next section, I discuss the external syntactic structure of the free relative construction.

3 External syntax of free relatives

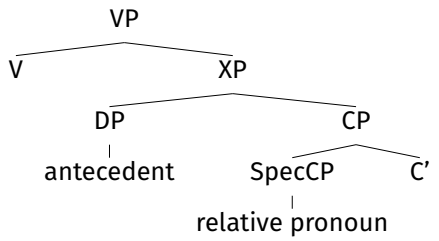
This section discusses the external syntax of free relatives. I show that the free relative pronoun is both the DP in the main clause and in the SpecCP of the embedded clause. I introduce Van Riemsdijk (2006a)'s concept of Grafting to account for this. Grafting entails that embedded features in one structure are remerged into a different structure. Applying this to free relatives means that the free relative is connected to the main and embedded clause via the relative pronoun. I also show how Nanosyntactic structures can be Grafted.

3.1 Two syntactic positions

In this section I discuss the syntactic position of the relative pronoun in the main and embedded clause. I provide evidence that indicates that the relative pronoun is part of the embedded clause and also of the main clause. I conclude, following Van Riemsdijk (2006a), that relative pronouns are simultaneously part of both clauses, and that they should be analyzed with Grafting, i.e. embedded features from one structure are remerged into a different structure.

Two positions are often considered for the relative pronoun in a free relative construction: the DP in the main clause and the SpecCP in the embedded clause (Bresnan & Grimshaw 1978; Groos & van Riemsdijk 1981). These options originate from the comparison between headed relative constructions and free relative constructions, as these are the positions of the antecedent and the relative pronoun in a headed relative clause. A syntactic structure of a headed relative clause is shown in (29).

(29)



Consider the headed relative clause in (30a) and its free relative counterpart in (30b).

(30) a. I like the book that you have finished reading.
b. I like what you have finished reading.

If one assumes that headed and free relative constructions have the same underlying syntax, the question that follows is whether *what* corresponds to the antecedent *the book* (the DP in the main clause) or to the relative pronoun *that* (in the SpecCP) in (29). The evidence that I discuss below suggests it should be in both.

Bresnan & Grimshaw (1978) argue that the relative pronoun is part of the main clause. One of the arguments she provides is that the relative pronoun triggers number agreement in the main clause, so it should be part of that clause. Himmelreich (2017) shows that this argument Bresnan & Grimshaw use for English also holds in German. In what follows I illustrate their argumentation, and compare a regular main clause, an indirect interrogative clause and a free relative construction.

In a regular main clause as in (31), a plural wh-subject requires plural number agreement.

(31) Himmelreich (2017: 166)
Welche Bücher haben/ *hat dir gefallen?
which book.PL have.PL/ have.SG 2SG.DAT liked
'Which books did you like?'

The construction is only grammatical if the plural subject *welche Bücher* 'which books' is able to agree with the plural form of the predicate (*haben* 'have.PL'), and it is ungrammatical when the predicate has the singular form *hat* 'have.SG'.

In contrast to that, wh-phrases that occur in embedded clauses (e.g. indirect interrogative clauses) do not affect the number agreement in the main clause, which is illustrated in (32).

(32) Himmelreich (2017: 167)
Welche Bücher ihm gefallen, ist/ *sind unklar.
which book.PL 3SG.DAT like, be.SG/ be.PL unclear
'It is unclear which books he likes.'

Welche Bücher 'which books' does not agree in number with the main clause predicate: the construction that contains the agreeing plural form *sind* 'be.PL' is ungrammatical, and the sentence becomes grammatical if the singular form of the predicate *ist* 'be.SG' is used. Thus, forms that are part of the embedded clause do not affect verbal agreement in the main clause.

If the relative pronoun patterns with the wh-element in a regular main clause as in (31) and shows agreement with the main clause verb, this is an indication that it is part of the main clause. If the relative pronoun does not show agreement with the verb in the main clause, and it patterns with the wh-element in indirect interrogative clauses as in (32), this indicates that it is part of the embedded clause. The data show that the relative pronoun patterns with the wh-element in a regular main clause: in free relative constructions with a plural (complex) wh-phrase, plural agreement is required.[14] *Welche Bücher* 'which

[14] Himmelreich gives examples of complex wh-phrases (*welche Bücher* 'which books') in German, since simple wh-phrases (e.g. *was* 'what') always have singular number agreement. In Spanish, number agreement with relative pronouns also occurs with simple plural wh-phrases (Himmelreich 2017: 168).

books' in (33) has to agree in number with *haben* 'have.PL', and the use of the singular form (*habe* 'have.SG') renders an ungrammatical result.

(33) Himmelreich (2017: 167)
Welche Bücher ich auch immer gelesen habe, haben/ *hat
which book.PL 1SG.NOM ever read have, have.PL/ have.SG
mir gefallen.
1SG.DAT liked
'I liked whatever books I read.'

This suggests that the relative pronoun is part of the main clause.

Note here though that this is positive evidence for the relative pronoun being part of the main clause, and not negative evidence indicating that the relative pronoun is not part of the embedded clause. In other words, (33) excludes the possibility that the relative pronoun is only part of the embedded clause and not of the main clause. This argument is compatible with the relative pronoun being simultaneously part of both the main and embedded clause, which is what I argue for, following Van Riemsdijk (2006a).

Groos & van Riemsdijk (1981) argue that the relative pronoun should be in the embedded clause. One of the arguments they use comes from relative clause extraposition. They examine the positional behavior of the DP in the main clause and the relative clause in headed relative clauses, and compare this to the position of the relative pronoun in free relative constructions. The headed relative clauses that Groos & van Riemsdijk discuss are given in (34).

(34) Groos & van Riemsdijk (1981: 185)
a. Der Hans hat das Geld, das er gestohlen hat, zurückgegeben.
the Hans has the money which he stolen has returned
'Hans has returned the money that he has stolen.'
b. Der Hans hat das Geld zurückgegeben, das er gestohlen hat.
the Hans has the money returned which he stolen has
'Hans has returned the money that he has stolen.'
c. *Der Hans hat zurückgegeben, das Geld, das er gestohlen hat.
the Hans has returned the money which he stolen has
'Hans has returned the money that he has stolen.'

The example in (34a) shows a headed relative clause with the DP *das Geld* 'the money' in the main clause and the relative clause *das er gestohlen hat* 'which he has stolen' in base position. In (34b), the relative clause is extraposed to the right edge of the sentence, and the DP in the main clause remains behind. This is possible in German and the sentence is grammatical. In (34c), both the relative clause and the DP in the main clause are extraposed, and the sentence is ungrammatical. The conclusion is that only the relative clause can be extraposed, but the DP from the main clause cannot.

The question is what happens to the relative pronoun if a relative clause in a free relative construction is extraposed. If the relative pronoun were part of the main clause, the relative pronoun would be expected to take the position of the DP in the main clause: it should be possible to be stranded on its own in the main clause (as in (34b)), and it should be impossible to extrapose to the right edge of the clause (as in (35a)). (35b), on the other hand, shows that a sentence is ungrammatical if the relative pronoun is stranded, and (35a), in which *was* 'what' is extraposed to the right edge of the clause, together with the rest of the relative clause, is grammatical.

(35) Groos & van Riemsdijk (1981: 185)

a. Der Hans hat zurückgegeben, was er gestohlen hat.
the Hans has returned what he stolen has
'Hans has returned what he has stolen.'

b. *Der Hans hat was zurückgegeben, er gestohlen hat.
the Hans has what returned he stolen has
'Hans has returned what he has stolen.'

This suggests that the relative pronoun is part of the embedded clause. To summarize, there is evidence that the relative pronoun is part of the main clause, and there is evidence that it is part of the embedded clause. Given these observations (and because relative pronouns seem to take case requirements from the main and embedded clause into account, see Section 1), different proposals have been made to let the relative pronoun simultaneously be the DP in the main clause and in the SpecCP of the embedded clause. These proposals can be grouped into two categories: (1) having a single element in each syntactic position, and realizing only one of them phonologically, or (2) having a single syntactic element that is part of both clauses because of a sharing relation (cf. multidominance or Grafting).

An example of the first type of proposal is the one by Himmelreich (2017). She argues that there are two elements (one in the main clause and one in the embedded clause) that bear the same syntactic feature values. The sharing of features comes about by several non-standard Agree relations. The two elements are always present, and one of the elements is always phonologically empty. In order to avoid having non-standard Agree relations and having to stipulate the presence of a phonologically empty element, I do not adopt Himmelreich (2017)'s approach. A proposal that fits into the second category is Asarina (2011)'s account for right node raising in Russian. She proposes that a case conflict can be resolved if conflicting case features on a single node can be realized by the same lexical entry. Her proposal does not extend to free relatives that are sensitive to more or less complex case. For these cases, there is not a single underspecified lexical entry available that corresponds to two cases. In the system of Asarina (2011) these sentences are predicted to crash, which is not what happens in German. However, Asarina (2011)'s and my analysis share the idea of having a single syntactic element that is simultaneously part of both the main and embedded clause via a sharing configuration. In my proposal, I adopt Van Riemsdijk (2006a)'s proposal of Grafting, on which I elaborate in the next section.[15]

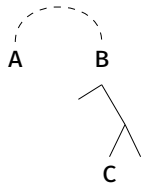
3.2 Grafting

Van Riemsdijk (2006a) has argued for a Grafting analysis, in which the relative pronoun is simultaneously the DP in the main clause and in the SpecCP of the embedded clause. In his proposal embedded features in one structure are remerged into a different structure. He argues that this special type of merge must exist, when all logical combinations of internal and external merge are taken into account. Grafting essentially combines properties of internal and external merge. The reasoning in Van Riemsdijk (2006a) goes as follows.

[15] An anonymous reviewer raised the questions what the motivation is for adopting Grafting and not (any other type of) multidominance. It goes beyond the scope of the paper to discuss the differences and similarities between sharing accounts such as multidominance and Grafting. The intuition that I adopt for this paper is that embedded syntactic structure can be remerged into a different clause (external remerge), which can be achieved by both Grafting and (at least some versions of) multidominance. For expository reasons, I frame this proposal using Van Riemsdijk (2006a)'s Grafting approach.

In (36a), A and B are combined with external merge. The two distinct structures are taken and combined to form the structure in (36b).

(36) a.



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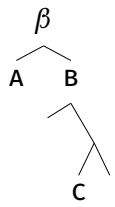
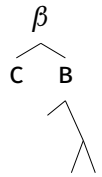


Internal merge takes a subpart of an existing structure as one of the two objects. In (37a), a subpart of a structure called C is combined with B via internal merge. The result is its movement, as shown in (37b).

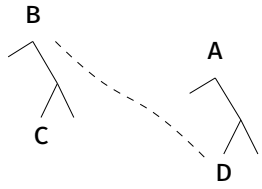
(37) a.

b.

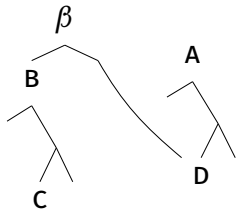


In Grafting, the properties of internal and external merge are combined. Just like in external merge, two distinct structures are combined, and, like in internal merge, a subpart of an existing structure is one of the merging objects. In (38a), merge applies to B and D. D is a subpart of an existing structure and it remerges with the distinct structure B (i.e. it is Grafted). In (38b), D is the element that is shared between the two structures. It is a sister of B but still preserves the structural relations within its own structure (Van Riemsdijk 2006a: 22).

(38) a.



b.



3.3 Grafting and Nanosyntactic structures

In this section, I show the analysis of free relative constructions with matching case requirements. The derivation presented is identical (apart from some simplifications) to what is proposed by Van Riemsdijk (2006b), except that in this proposal the relative pronoun consists of a complex syntactic structure rather than a single syntactic node. Just like in Van Riemsdijk (2006b), the derivation proceeds in three steps.[16]

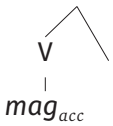
(39) Derivational steps for German matching free relatives
  a. Externally merge the embedded clause predicate with the relative pronoun
  b. Internally remerge the relative pronoun to the left edge of the clause
  c. Externally remerge (Graft) the main clause predicate with the relative pronoun

The sentence under examination is given in (40), repeated from the introduction. Both *lade ein* 'invite' and *mag* 'likes' require their objects to be in accusative case.

(40) Vogel (2001: 344)
  Ich lade ein, wen auch Maria mag.
  I invite$_{acc}$ who.ACC also Maria likes$_{acc}$
  'I invite whoever Maria also likes.'

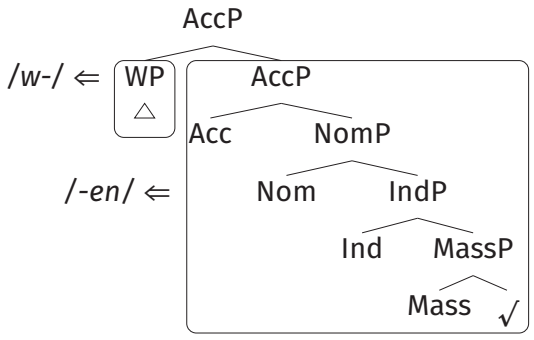
The derivation starts with the embedded clause. *Mag* 'likes' combines with an accusative, as shown in (41).[17]

(41)



The accusative relative pronoun in (40) has an individuative mass type interpretation, so this structure needs to be built. This happens in a similar way to how *was* 'what' was built in Section 2.3. I leave out the derivation of the pronoun *wen* 'who.ACC', and I give the result in (42).

(42)

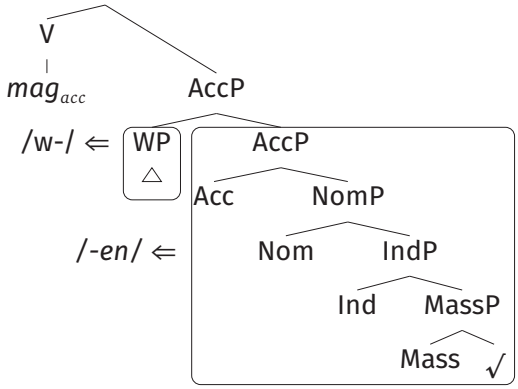


[16] Non-spellout driven movement, such as the movement of the relative pronoun to the SpecCP position, falls outside the scope of this paper. See De Clercq (2019: 21) for an approach in which syntactic movement is motivated by spellout. The idea is that a feature can (right after being merged) attract a constituent from the derivation to its specifier, if it provides the feature with a spellout. This movement precedes spellout-driven movement operations.

[17] In this paper I do not discuss argument selection. For now I assume that part of the syntactic structure associated with the predicate selects for the case it requires, and merges with this particular case node in the syntax. In this paper I abstract away from this, and the predicate is simply merged directly with the required case node.

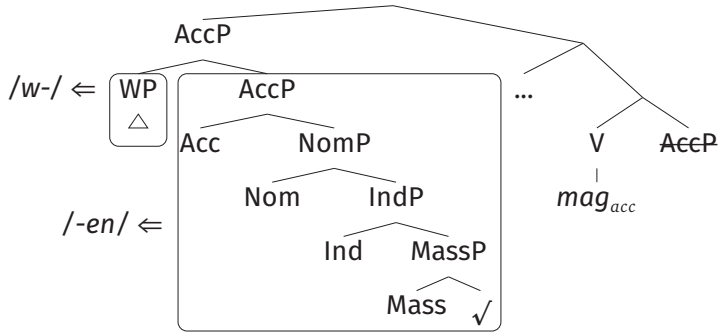
The embedded clause predicate *mag* 'likes' merges with the accusative relative pronoun (the AccP), as shown in (43).

(43)



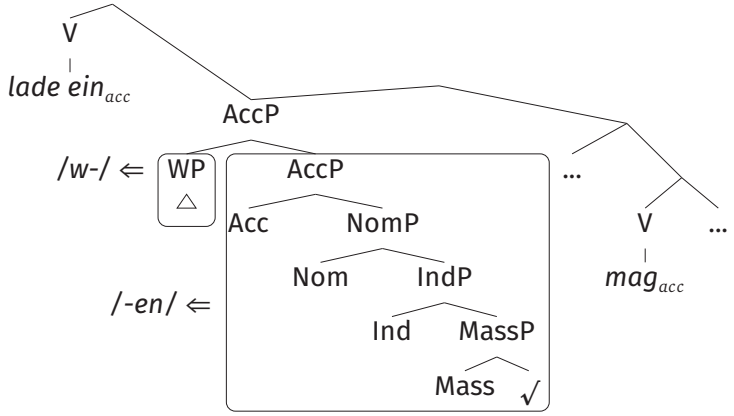
I ignore the construction of the rest of the structure, and continue with the second derivational step: the AccP is internally remerged to the left edge of the clause. The dots in (44) refer to the material between the leftmost position in the clause and the predicate. The position where the relative pronoun is moved from is ~~AccP~~.

(44)



Lade ein 'invite' requires its object to be in accusative, so it has to combine with the AccP. Grafting occurs: the AccP externally remerges with the main clause predicate, as shown in (45). As a result, *wen* 'who.ACC' is part of both the main and embedded clause.[18]

(45)



[18] There are some issues that need to be resolved, such as the linearization of these structures and theta role assignment. I do not have anything to offer here, and leave it open to future research.

To summarize, Section 3 discussed the external syntax of free relative constructions. I argued for a Grafting approach (Van Riemsdijk 2006a), and I showed how Nanosyntactic structures can be Grafted to account for a matching free relative. With the background from the last two sections in mind, I derive the mismatching free relatives in the next section.

4 Deriving the patterns

In this section, I outline my analysis, accounting for the patterns in Table 1, repeated in Table 5.

I propose that mismatching free relatives are derived in the three steps described in (39) (although I will revise the steps slightly). First, the relative pronoun is externally merged with the embedded clause predicate. Second, the relative pronoun is internally remerged to the edge of the clause. In the third step, several option are possible, all of which involve the Grafting of two elements. If the embedded clause predicate requires a more complex case than the main clause predicate (the left column in Table 5), the required embedded case node is Grafted into the main clause. I go through the derivations in Section 4.1. If the main clause predicate requires the more complex case, the required case node is not available for the main clause predicate to externally remerge remerge with. Instead, the highest case node is externally remerged with the next case node in the fseq. Case features are added until the case node required by the main clause predicate is merged. The adding of case features is subject to a restriction, which correctly rules out non-syncretic forms and correctly predicts syncretic forms to be grammatical. I discuss the relevant derivations (those of the configurations in the right column in Table 5) in Section 4.2.

4.1 Grafting a less complex case

I start by discussing free relative constructions in which the case required in the embedded clause is more complex than the case required in the main clause. These constructions are grammatical, independent of whether the forms corresponding to the cases are syncretic or not. I first discuss the examples with non-syncretic forms. Then, I show how the same analysis derives the syncretic variant. In the case of non-syncretic forms, the relative pronoun needs to appear in the form that corresponds to the more complex case, as shown again in (46). The use of *wem* 'who.DAT' grammatical, the use of *wen* 'who.ACC' is not.

(46) Vogel (2001: 344)

a. Ich lade ein, wem auch Maria vertraut.
I invite$_{acc}$ who.DAT also Maria trusts$_{dat}$
'I invite whoever Maria also trusts.'

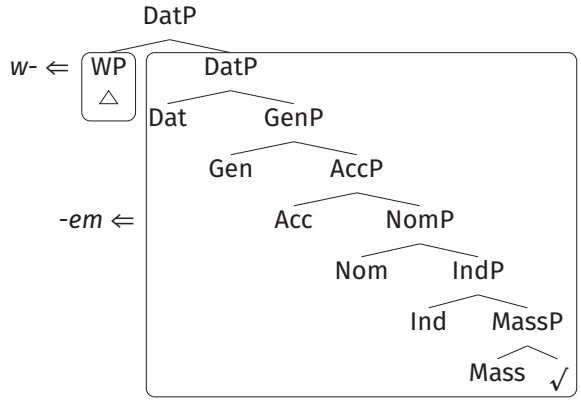
b. *Ich lade ein, wen auch Maria vertraut.
I invite$_{acc}$ who.ACC also Maria trusts$_{dat}$
'I invite whoever Maria also trusts.'

Table 5: Grammaticality pattern for German.

	case in embedded clause	
	more complex	less complex
distinct forms	✓	×
syncretism	✓	✓

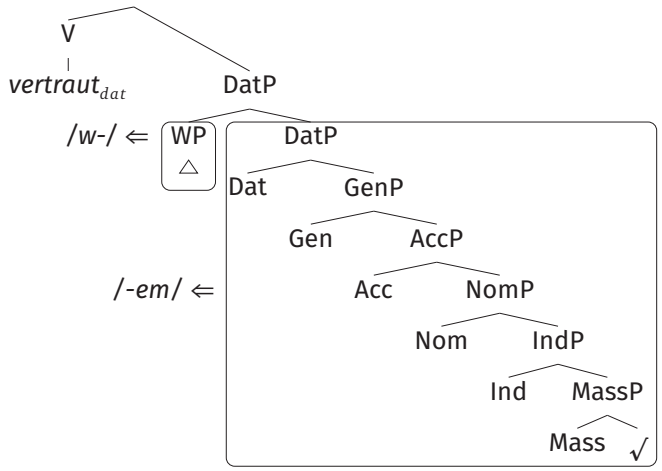
The derivation starts with the embedded clause. *Vertraut* 'trusts' in (46a) combines with a relative pronoun with an individuative mass type interpretation in dative case. This relative pronoun is built as shown in (47).

(47)



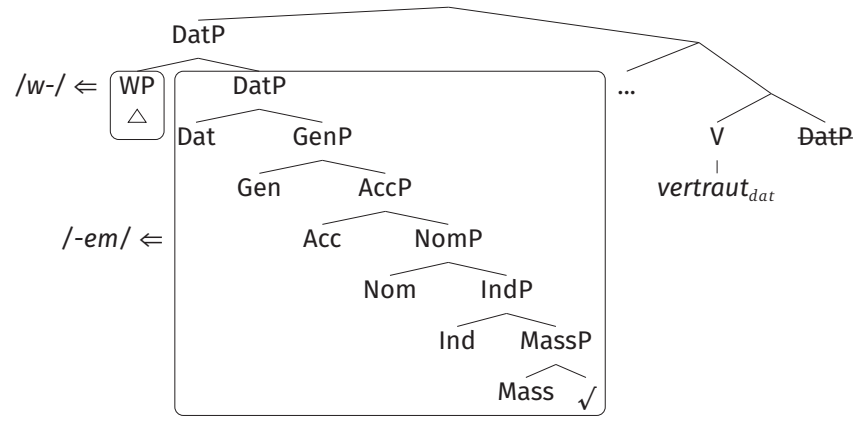
It becomes clear why the accusative relative pronoun *wen* 'who.ACC' cannot be used in this configuration, and why (46b) is ungrammatical: *wen* 'who.ACC' has been overwritten by *wem* 'who.DAT' during the creation of the dative relative pronoun. First, the predicate *vertraut* 'trusts' externally merges with the DatP, as shown in (48).

(48)



In the next step, the DatP is internally remerged to the left edge of the clause, as shown in (49).

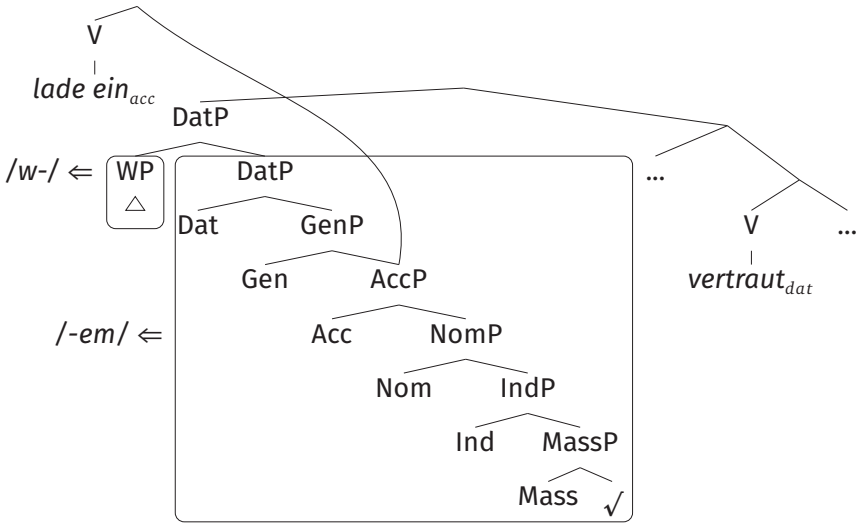
(49)



Finally, the relative pronoun is externally remerged with the main clause predicate. The main clause predicate is *lade ein* 'invite', which requires its object to be in accusative. Therefore, it is not the highest node, the DatP, that is externally remerged, but it is the AccP, an embedded case node. What is crucial here is that the DatP always contains the AccP in the fseq (Caha 2009). This is the reason why the DatP can also satisfy an accusative case requirement. In Section 5.2 I show that it is language-specific whether only the highest case node or also with an embedded case node can be Grafted. German groups with languages that allow for Grafting embedded case nodes.

The last step of the derivation is illustrated in (50): AccP is Grafted into the main clause.

(50)



Grafting targets embedded features; DatP and AccP are both embedded in the structure (i.e. none of them is the root), so the Grafting operation is the same. In (51), I give a revised version of the derivational steps, in which case nodes on the relative pronoun are included.

(51) Derivational steps for non-matching free relatives in German (to be revised)
- a. Externally merge the embedded clause predicate with the required case node
- b. Internally remerge the relative pronoun to the left edge of the clause
- c. Externally remerge (Graft) the main clause predicate with the required case node

For completeness, I also include the analysis for the syncretic variant in the left column of Table 5. Again, the more complex case is required in the embedded clause, but now a syncretic form corresponds to the different cases, as in (52).

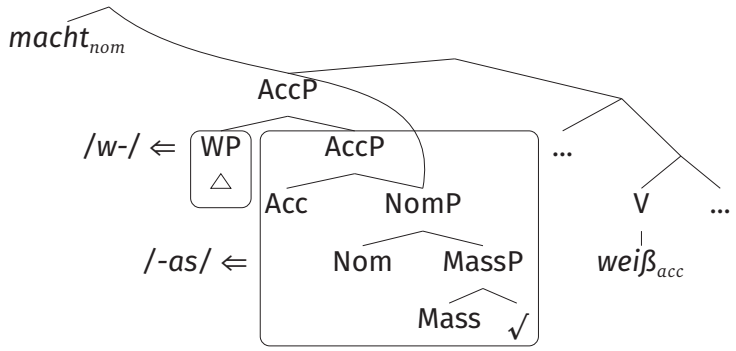
(52) Vogel (2001: 363)

Was	ich	nicht	weiß,	macht	mich	nicht	heiß.
What.NOM/ACC	I	not	know$_{acc}$	makes$_{nom}$	me	not	hot

'What I don't know doesn't excite me.'

The analysis is identical to the one described in this section, illustrated in (53). First, *weiß* 'know' combines with the AccP. In the next step, the AccP is moved to the left edge of the clause. Last, *macht* 'makes' externally remerges with the NomP (which is contained in the AccP).

(53)



In this section, I discussed configurations in which the embedded clause predicate requires a more complex case than the main clause predicate.

4.2 Grafting a more complex case

In this section, I discuss configurations in which the embedded clause predicate requires a less complex case than the main clause predicate. The first two steps in (51) can proceed as in the previous section, but the external remerge of the relative pronoun with the main clause predicate is not possible. I illustrate this with the example in (54). The embedded clause predicate *gefällt* 'pleases' combines with a nominative subject, and the main clause predicate *erzähle* 'tell' combines with an accusative object.

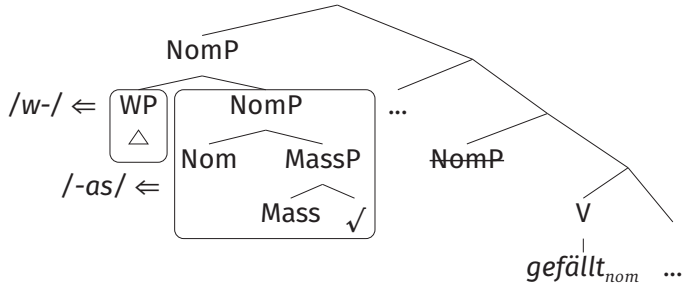
(54) Vogel (2001: 344)

Ich	erzähle,	was	immer	mir	gefällt.
I	tell$_{acc}$	what.NOM/ACC	ever	me	pleases$_{nom}$

'I tell whatever pleases me.'

The derivation starts in the embedded clause, where *gefällt* 'pleases' merges with the NomP, and the NomP moves to the left edge of the clause. (55) shows the structure after this step.

(55)



At this point, *erzähle* 'tell' is supposed to externally remerge with an AccP. However, as can be seen in (55), there is no AccP available in the structure (NomP does not contain AccP). Fortunately, there is another way for the derivation to proceed. Not only the main clause predicate can externally remerge case nodes, but other elements, such as other case features, can do this as well. Whichever two elements are externally remerged, the Grafting operation remains the same. I suggest that case features are merged, until the case node required by the main clause is available, and the main clause predicate can be merged.

I show that German is subject to a certain restriction with respect to merging additional case features. The added features are not permitted to cause an overriding of the

spellout. I call this restriction Keep spellout. This restriction is going the make the crucial distinction between syncretic and non-syncretic forms: in the syncretic case, the same lexical entry, (the same spellout) is used, but in the non-syncretic case, a different lexical entry (a different spellout) is used. Normally, the Principle of Cyclic Override applies if newly added features are spelled out and the previous spellout is overridden. However, in this case, a single element is part of two syntactic structures. It seems that in a Grafting situation, Cyclic Override needs to be restricted. In Section 5.2 I show that it is language-specific whether Keep spellout holds. German groups with languages that does not allow overriding. (56) describes the derivational steps for German non-matching free relatives, taking this restriction into account.

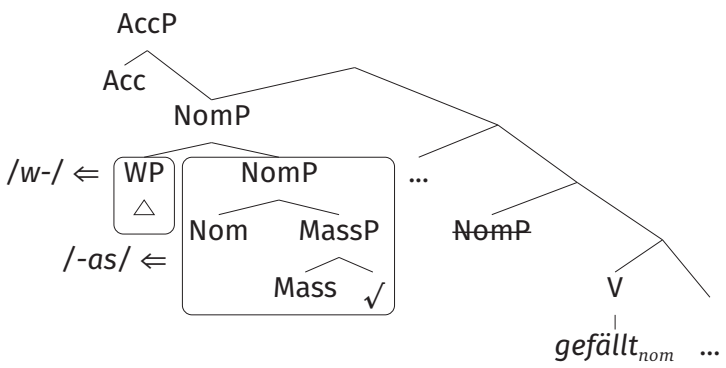
(56) Derivational steps for German non-matching free relatives
   a. Externally merge the embedded clause predicate with the required case node
   b. Internally remerge the relative pronoun to the left edge of the clause
   c. Externally remerge (Graft) the main clause predicate with the required case node
      (i) if the required case node is not available, externally remerge (Graft) the highest case feature with the next case feature in the fseq, and externally merge the main clause predicate with the required case node
      (ii) if the required case node is not available, continue to externally merge the additional case features following the fseq (until the required case node has merged), and externally merge the main clause predicate with the required case node → restriction Keep spellout: only case features within the boundaries of the inserted lexical entry can be merged

In the remainder of this section I show how the revised derivational steps derive the syncretic and non-syncretic configurations.

4.2.1 Syncretic forms

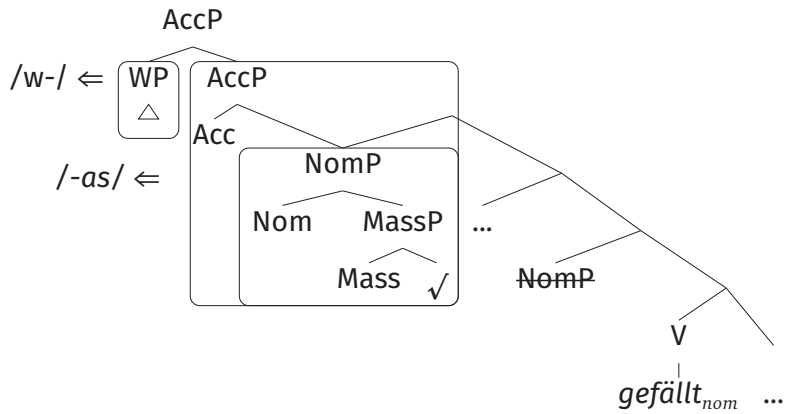
I showed that if the main clause predicate *erzähle* 'tell' requires a more complex case than the embedded clause predicate (as in (54)), external remerge cannot take place between the predicate and the required case node. Instead, the next case feature in the fseq externally remerges the highest case node. The required case node is AccP, so accusative case features are merged. The highest case node is the NomP, so accusative features are merged to create an AccP, as shown in (57).

(57)



The AccP needs to receive a spellout. There is no lexical entry available for the AccP that contains the WP and NomP. Following the spellout algorithm, the WP cyclically moves to the left of Acc (Cyclic). At this point, the AccP can be realized as *-as* (see (23)).[19]

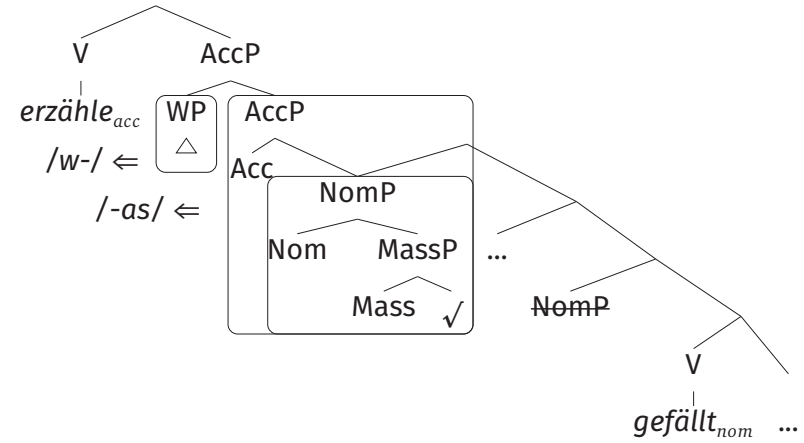
(58)



This insertion adheres to the restriction Keep spellout. The nominative and accusative in unbounded mass are syncretic in German, so there is a single lexical entry that is used both as nominative and as accusative. In (58), it is still the lexical entry *-as* that is inserted into the AccP, just as it was for the NomP.

With the AccP available, the main clause predicate *erzähle* 'tell' can merge with the accusative case node it requires, shown in (59).

(59)



4.2.2 Non-syncretic forms

In the previous section I discussed the grammatical example in which the embedded clause predicate requires a less complex case, and there is a syncretic form for both required cases (the lower right cell in Table 5). This section discusses the ungrammatical examples in which the embedded clause predicate requires a less complex case than the main clause predicate, and the phonological forms that correspond to the two cases differ. I repeat the examples in (60).

[19] I assume here that *-as* can be inserted because the Acc, Nom, Mass and √ form a constituent: Acc dominates Nom, Mass and √. The embedded clause does not play a role in the insertion process.

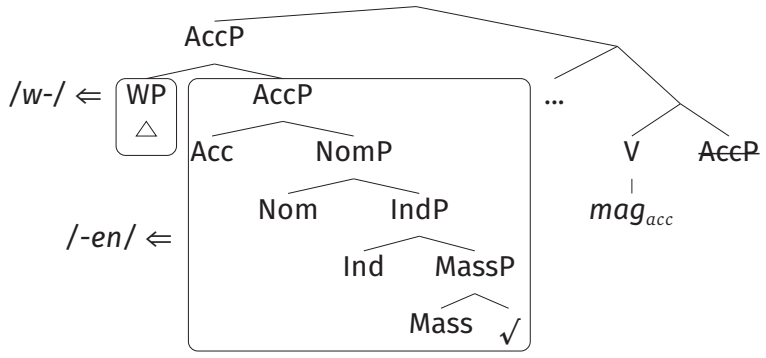
(60) Vogel (2001: 345)

a. *Ich vertraue, wen auch Maria mag.
I trust$_{dat}$ who.ACC also Maria likes$_{acc}$
'I trust whoever Maria also likes.'

b. *Ich vertraue, wem auch Maria mag.
I trust$_{dat}$ who.DAT also Maria likes$_{acc}$
'I trust whoever Maria also likes.'

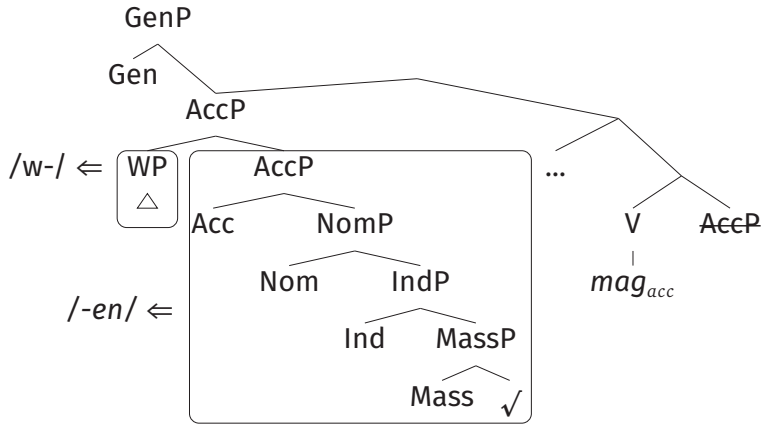
Again, up to the second step, the derivation proceeds normally. The derivation starts in the embedded clause. First, *mag* 'likes' externally merges with the AccP, and the relative pronoun is internally remerged to the left edge of the clause. (61) shows the structure after this step.

(61)



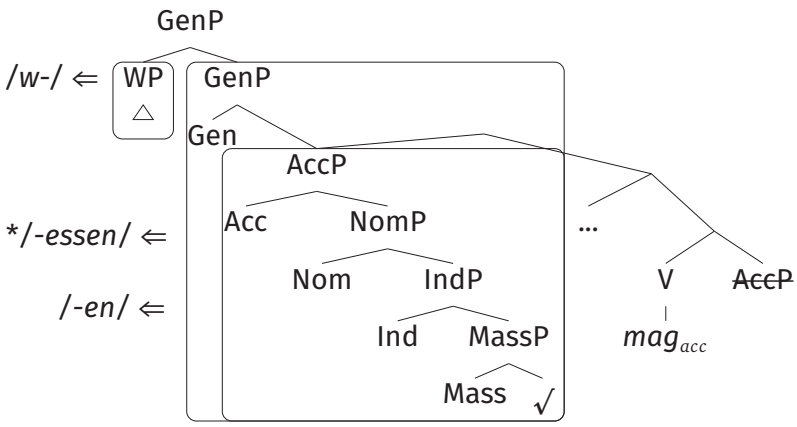
Vertraue 'trust' is supposed to externally remerge with a DatP. However, there is no DatP available in the structure (AccP does not contain DatP), so Grafting between the predicate and the required case node cannot take place. Instead, the next case feature in the fseq externally remerges the highest case node. Ultimately, the structure needs to be built up to the DatP. The first step is to externally remerge the AccP with genitive features, creating a GenP, as shown in (62).

(62)



The GenP needs to receive a spellout. There is no lexical entry available for the GenP containing the WP and the AccP. Following the spellout algorithm, the WP cyclically moves to the left of Gen (Cyclic). The GenP is realized as *-essen* (which is the genitive individuative mass).

(63)



However, the insertion of *-essen* violates the restriction Keep spellout. The phonological form *-essen* overrides the earlier spellout *-en*. Because this overriding is not permitted, the derivation crashes and the construction is ungrammatical.

To summarize, in this section I showed that satisfying two different case requirements happens in three steps. First, the relative pronoun is externally merged with the embedded clause predicate. Second, the relative pronoun is internally remerged to the left edge of the clause. In the third step, Grafting takes place. In case the embedded clause requires the more complex case, the main clause predicate externally remerges with an embedded case node. When the main clause requires the less complex case, the highest case node and the next case feature in the fseq are externally remerged. Case features are merged until the required case feature is added, and then the main clause predicate combines with the required case node. German is subject to the restriction Keep spellout: case features can be added as long as the spellout of the relative pronoun remains the same.

5 Cross-linguistic differences

In the previous section I showed how the grammaticality pattern of German can be captured using case containment and Grafting. This section discusses patterns that appear in other languages. First, I briefly return to the point that syncretism resolving case conflicts seems to be universal. Then, I switch to non-syncretic forms, and I show that some languages behave differently from German in this respect. Two aspects of the analysis for German are shown to be language-specific, and are formulated in terms of restrictions. Varying the presence of these restrictions provides different grammaticality patterns observed in four different languages.

5.1 Syncretism across languages

In Section 4.2.1, I showed how the German *was* 'what.NOM/ACC' can satisfy nominative case requirement from the embedded clause and an accusative case requirement from the main clause. I argued that this is possible because the next case feature (accusative) can be externally remerged with the highest case node available in the structure (NomP). This is permitted as long as the phonological form of the relative pronoun does not change, i.e. as long as the same lexical entry is used. This possibility to freely insert features within the boundaries of a lexical entry is not specific to German. The examples from (6), repeated here in (64), show that syncretism is able to resolve feature conflicts in free relatives cross-linguistically.

(64) a. *Russian* (Levy & Pollard 2002: 222)
Kogo ja iskal, ne bylo doma.
who.ACC/GEN I sought$_{acc}$ not was$_{gen}$ home
'Who I was looking for wasn't at home.'

b. *Conversational Bulgarian* (Izvorski 1997: 279)
Šte celuna kojto dojde prâv.
will kiss$_{acc}$ who.NOM/ACC comes$_{nom}$ first
'I will kiss whoever comes first.'

c. *Polish* (Himmelreich 2017: 17, after Citko 2013)
Jan unika kogokolwiek wczoraj obraził
Jan avoids$_{gen}$ whoever.ACC/GEN yesterday offended$_{acc}$
'Jan avoided whoever he offended yesterday.'

The analysis laid out in this paper holds for syncretic non-matching free relatives cross-linguistically.

5.2 Language-specific restrictions

So far, the proposal holds cross-linguistically for the syncretic cases, but it does not for the non-syncretic cases. This section extends the proposal such that it also accounts for these patterns. I have shown that German non-matching non-syncretic free relative constructions are only grammatical when the more complex case is required in the embedded clause. This section shown that Gothic permits the constructions independent of which clause requires the more complex case, Polish does not allow any non-matching non-syncretic free relatives, and in Greek non-matching non-syncretic free relatives are only grammatical if the more complex case is required in the main clause. An overview is given in Table 6.

The variation between the languages can be reduced to the presence or absence of two restrictions. The first restriction (Keep spellout), which has been shown to hold for German, is that the spellout of the relative pronoun needs to remain the same, and it cannot be overridden.[20] The second restriction, which has not been discussed yet because it does not apply to German, is that external remerge can only take place with the highest case node (and not with an embedded one). I call this restriction Only Graft highest node. I propose that languages differ in whether or not the restrictions hold. The presence or absence of two restrictions generates four possible patterns that arise in four

Table 6: Grammaticality patterns non-matching non-syncretic free relatives.

	embedded clause case	
	more complex	less complex
German	✓	×
Gothic	✓	✓
Polish	×	×
Greek	✓	✓

[20] It was suggested to me by an anonymous reviewer this ban on overriding is not hardwired in language, but something that differs per language. Overriding does not seem to hold for languages with case attraction, such as Gothic. I thank the anonymous reviewer for this suggestion.

different languages: German, Gothic, Polish and Greek. (65) shows a updated version of the derivational steps, in which the restrictions per language are incorporated.

(65) Derivational steps for non-matching free relatives
  a. Externally merge the embedded clause predicate with the required case node
  b. Internally remerge the relative pronoun to the left edge of the clause
  c. Externally remerge (Graft) the main clause predicate with the required case node → restriction Only Graft highest node for Polish and Greek: only the structurally highest case node can be Grafted
    (i) if the required case node is not available, externally remerge (Graft) the highest case feature with the next case feature in the fseq, and externally merge the main clause predicate with the required case node
    (ii) if the required case node is not available, continue to externally merge the additional case features following the fseq (until the required case node has merged), and externally merge the main clause predicate with the required case node → restriction Keep spellout for German and Polish: only case features within the boundaries of the inserted lexical entry can be merged

Table 7 shows which restriction holds for which language. First, Polish has both restrictions: it is not allowed to override the spellout of the relative pronoun, and only the highest case node can be Grafted. German only has one restriction: it is required to keep its spellout, but Grafting of the highest and embedded nodes is permitted. Greek is the opposite of German in that it allows for overriding of the spellout, but it does not permit Grafting an embedded case node. Gothic is the most free of the four languages: none of the restrictions hold.

In the remainder of this section I show the relevant data and I derive the patterns with the derivational steps in (65).

5.2.1 Gothic

The first language I discuss is Gothic. In Gothic, the relative pronoun takes the case of the more complex predicate, independent of whether it is the main clause or the embedded clause predicate that requires it. The generalizations regarding Gothic originate in Caha (2014). (66a) gives an example of a predicate requiring a more complex case in the embedded clause and a predicate requiring a less complex one in the main clause. *Lag* 'lay' takes a dative in the embedded clause, and *ushafjands* 'picking up' takes an accusative in the main clause. In (66b), the case requirements are reversed: *qiþiþ* 'say' takes an accusative in the embedded clause and *taujau* 'do' takes a dative in the main clause. In both (66a) and (66b) the dative relative pronoun is used.

Table 7: Two possible restrictions in four languages.

		Only Graft highest node	
		yes	no
Keep spellout	yes	Polish	German
	no	Greek	Gothic

(66) *Gothic* (Harbert 1978: 339, 434)

a. ushafjands ana þamm-ei lag
picking up$_{acc}$ on DAT-COMP lay$_{dat}$
'picking up that on which he lay'

b. hva nu wileiþ ei taujau þamm-ei qiþiþ þiudan Iudaie?
what now want that do$_{dat}$ DAT-COMP say$_{acc}$ king of Jews
'What now do you wish that I do to him whom you call King of the Jews?'

The derivation of (66a), in which the embedded clause predicate requires the more complex case, is identical to the one for German described in Section 4.1. First, the embedded clause predicate *lag* 'lay' externally merges with the dative case of the relative pronoun. Next, the relative pronoun is internally remerged to the left edge of the clause. Last, the main clause predicate *ushafjands* 'picking up' externally remerges with the embedded accusative case node.

The construction in (66b) is grammatical in Gothic but its German counterpart is not. Therefore, the derivation for the Gothic (66b) differs from what is described in Section 4.2.2 for German. I suggested that the difference between the languages can be reduced to whether or not it is allowed to override the spellout of the relative pronouns after Grafting (i.e. the presence or absence of Keep spellout). This restriction does not hold for Gothic. The first step in the derivation is that the embedded clause predicate *qiþiþ* 'say' externally merges with the accusative case node. Next, the relative pronoun internally remerges to the left edge of the clause. In the third step, the dative case node is not available for the main clause predicate *taujau* 'do' to be externally remerged with. Therefore, the highest case node (AccP) externally remerges with the next case feature in the fseq (creating a GenP), and with the next feature after that (creating a DatP), such that the required (dative) case node has been merged. The spellout of the accusative relative pronoun is overridden, first by the genitive, and then by the dative. This is the point at which Gothic and German crucially differ: overriding the spellout of the relative pronoun is not allowed in German (illustrated by (63)), but it is in Gothic. Finally, the main clause predicate *taujau* 'do' merges with the dative case node. In this derivation, the spellout of the Gothic relative pronoun is overridden, which is the crucial difference between Gothic and German.

5.2.2 Polish

The next language I discuss is Polish. In Section 1, I mentioned that Polish (and a different variety of German) requires a stricter form of matching than the variety of German I discussed in this paper. Non-syncretic non-matching free relatives are ungrammatical, independent of whether the embedded or the main clause requires the more complex case. The generalizations regarding the Polish data originates in Himmelreich (2017). In (67a), the embedded clause predicate *dokucza* 'teases' requires a dative object, and the main clause predicate *lubi* 'likes' requires an accusative. In (67b), the embedded clause predicate *wpuścil* 'let' requires an accusative object, and the main clause predicate *ufa* 'trusts' requires a dative. The constructions are ungrammatical, independent of which relative pronoun is used.

(67) *Polish* (Himmelreich 2017: 17, after Citko 2013)

a. *Jan lubi kogokolwiek/komukolwiek dokucza.
Jan likes$_{acc}$ whoever.ACC/whoever.DAT teases$_{dat}$
'Jan likes whoever he teases.'

b. *Jan ufa kogokolwiek/komukolwiek wpuścił do domu.
Jan trusts$_{dat}$ whoever.ACC/whoever.DAT let$_{acc}$ to home
'Jan trusts whoever he let into the house.'

The construction in (67a) is ungrammatical in Polish, but its counterparts in German and Gothic are not. Therefore, the derivation has to differ from what is described in Section 4.1 and Section 5.2.1. I suggest that the difference between German and Gothic on the one hand and Polish on the other is that for Polish the restriction Only Graft highest node holds, whereas it does not for German and Gothic. In the first step of the derivation of (67a), the embedded clause predicate *dokucza* 'teases' externally merges with the DatP on the relative pronoun. Next, the relative pronoun is internally remerged to the left edge of the clause. Then, the third step of the derivation cannot take place: the main clause predicate *lubi* 'likes' requires accusative case, which is not the highest case node but an embedded one. Remerging an embedded node is not allowed because of the Only Graft highest node restriction.[21]

The derivation of (67b) is identical to the one for German described in Section 4.2.2. Just like for German, Polish has the restriction Keep spellout. In the first step of the derivation, the embedded clause predicate *dokucza* 'teases' externally merges with the AccP on the relative pronoun. Next, the relative pronoun is internally remerged to the left edge of the clause. The third step cannot take place. First, there is no dative case node available for the main clause predicate *ufa* 'trusts' to externally remerge with. Second, no extra case features can be externally remerged with the highest case feature without changing the spellout of the relative pronoun (Keep spellout).

5.2.3 Greek

Greek is the opposite of German in that non-syncretic non-matching free relatives are grammatical if the case required in the main clause is the more complex one (whereas it is the embedded clause in German). Greek and German have with each other in common that it is the relative pronoun in the more complex case that has to be used. The Greek data and generalizations are taken from Daskalaki (2011).

In (68a), *ðósi* 'given' takes a recipient in genitive case in the embedded clause, and *efχarístisan* 'thanked' requires nominative case in the main clause. Neither the use of *ópjon* 'who.GEN.PL' nor *ópji* 'who.NOM.PL' provides a grammatical result (see (68a)). In (68b), the embedded clause predicate *voíθise* 'helped' requires a nominative, and the main clause predicate *eðósa* 'gave' requires a genitive recipient. If the relative pronoun appears in genitive case (the most complex and main clause case), the sentence is grammatical. If the relative pronoun appears in nominative case (the less complex and embedded clause case), the sentence is ungrammatical.

[21] As shown in (64c), syncretism saves a case conflict in Polish. At first sight, the restriction Only Graft highest node seems to rule out the syncretic case when the embedded clause requires a more complex case than the main clause. One possibility concerns the nature of the element that is merged with the predicate of the main clause. The concept that keeps reoccurring in the discussion about syncretic forms is 'the same lexical entry'. In the case of a syncretism, the selected phonological form in the embedded clause is ambiguous: it can be either the biggest case it corresponds to, or the smaller one. If it would be only the phonological form that is available for remerge in the main clause, there is no way of telling whether it was the bigger case or the smaller case that was required in the embedded clause. In a sense, the syncretic form is able to 'fool' the main clause predicate. I leave it for future research to determine whether this option is viable.

(68) *Greek* (Daskalaki 2011: 79–80)

a. *Me efχarístisan ópjon/ ópji íχa ðósi
CL.1SG.ACC thanked.3PL$_{nom}$ who.GEN.PL/ who.NOM.PL had.1SG$_{gen}$ given
leftá.
money
'Whoever I had given money to, thanked me.'

b. Eðósa leftá ópju/ *ópjos me voíθise.
gave.1SG$_{gen}$ money who.GEN/ who.NOM CL.1SG.ACC helped.3SG$_{nom}$
'I gave money to whoever helped me.'

The derivation of (68b) is identical to the one described for Polish in 5.2.2. Greek has the restriction Only Graft highest node, just as Polish (but unlike German and Gothic). The first step of the derivation is that the embedded clause predicate *ðósi* 'given' externally merges with the genitive case node of the relative pronoun. Next, the relative pronoun is internally remerged to the left edge of the clause. In the third step, the main clause predicate *efχarístisan* 'thanked' should be externally remerged with the nominative case node. However, the nominative case node is an embedded node, and in Greek it is not permitted to merge with anything but the highest case node. The third step in the derivation cannot take place, and the derivation crashes.

The derivation for (68b) is identical to the derivation of the Gothic example (66a) in 5.2.1. Greek does not have the restriction Keep spellout, just as Gothic (but unlike German and Polish). The first step in the derivation is that the embedded clause predicate *voíθise* 'helped' externally merges with the nominative case node of the relative pronoun. Second, the relative pronoun internally remerges to the left edge of the clause. In the third step, the genitive case node is not available for the main clause predicate *eðósa* 'gave' to be externally remerged with. Therefore, the highest case node (NomP) merges with the next case feature in the fseq (creating an AccP) and with the next case feature after that (creating a GenP), such that the required case node has been merged. Finally, the main clause predicate *eðósa* 'gave' merges with the genitive case node. The spellout of the relative pronoun is overridden in this derivation, just like what happened for Gothic.

To sum up, languages differ in whether non-matching non-syncretic free relative are grammatical. In some languages they are grammatical if the embedded clause requires the more complex case (German and Gothic), if the main clause requires the more complex case Gothic and Greek), or they are never grammatical (Polish). It holds for all languages that in grammatical non-matching non-syncretic free relatives, the relative pronoun in the more complex case is used. In this section I reduced the cross-linguistic differences to two restrictions that may or may not be present in a language. The restrictions are incorporated in the derivational steps that I proposed for German non-matching free relatives.

6 Conclusion

This paper started out with the observation that case mismatches in German free relative constructions are permitted under two types of circumstances. First, if the case required in the embedded clause is more complex than the case in the main clause, and the relative pronoun has the form of the more complex case (cf. Pittner 1991; 1995; Vogel 2001; Grosu 2003). Second, when the form that corresponds to the two different required cases is syncretic (cf. Groos & van Riemsdijk 1981; Dyta 1984; Zaenen & Karttunen 1984; Pullum & Zwicky 1986; Ingria 1990; Dalrymple & Kaplan 2000; Sag 2003). Mismatching

free relatives are ungrammatical when the embedded clause predicate requires the less complex case, and there are two distinct relative pronouns for the required cases.

I provided an analysis for these two patterns by taking case containment (Caha 2009) as a point of departure, and combining it with Van Riemsdijk's (2006a) Grafting (or external remerge). This made it possible to make a distinction between more and less complex cases in the syntax. It no longer comes as a surprise that a relative pronoun can satisfy the case requirement of a predicate which is less complex than what the relative pronoun is marked for. Cases are organized in a containment structure and more complex cases by definition contain less complex cases. Therefore, at the point in the derivation that the less complex case is required, the main clause predicate can merge with the case node contained in the more complex case. When the main clause requires a less complex case than the embedded clause, the required case node is not available. Additional case features can be merged as long as they have the same spellout. This makes the crucial distinction between syncretic and non-syncretic constructions: syncretic forms are grammatical because have the same spellout, but non-syncretic forms are not grammatical because they do not. This paper adds to the claim that case is internally complex. Moreover, it shows that cases can have two roles at the same time: they fulfill the role of the case they surface in, and the role of a case they contain. In this type of situation, it is always the most complex case that surfaces, as has also been shown in Caha (2015).

In the final section I discussed different grammaticality patterns that are observed in non-matching non-syncretic free relatives across languages. It differs per language whether they allow for the embedded clause predicate or the main clause predicate to require the more complex case. It holds for all languages that the relative pronoun has to appear in more complex case. I reduced these cross-linguistic differences to two restrictions that may or may not hold for the language. The first restriction, Only Graft highest node, is whether the main clause is permitted to Graft an embedded case feature or only the structurally highest case node. The second restriction, Keep spellout is whether the spellout of the relative pronoun can be overridden or not. The grammaticality patterns of German, Polish, Gothic and Greek follow from these four derivational steps, taking the two restrictions into account.

(69) Derivational steps for non-matching free relatives
   a. Externally merge the embedded clause predicate with the required case node
   b. Internally remerge the relative pronoun to the left edge of the clause
   c. Externally remerge (Graft) the main clause predicate with the required case node → restriction Only Graft highest node for Polish and Greek: only the structurally highest case node can be Grafted
      (i) if the required case node is not available, externally remerge (Graft) the highest case feature with the next case feature in the fseq, and externally merge the main clause predicate with the required case node
      (ii) if the required case node is not available, continue to externally merge the additional case features following the fseq (until the required case node has merged), and externally merge the main clause predicate with the required case node → restriction Keep spellout for German and Polish: only case features within the boundaries of the inserted lexical entry can be merged

Future research should identify other constructions with similar mechanisms in which the same restrictions surface, which could help understand the underlying motivations behind the identified restrictions.

Abbreviations

1, 2, 3 = 1, 2, 3 person, NOM = nominative, ACC = accusative, GEN = genitive, DAT = dative, N = neuter, M = masculine, SG = singular, PL = plural, COMP = complementizer.

Additional File

The additional file for this article can be found as follows:

- **Appendix.** Other case combinations. DOI: https://doi.org/10.5334/gjgl.821.s1

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The author has no competing interests to declare.

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