As I mentioned earlier, languages differ in how they agree. The difference between internal-only languages such as German and matching languages such as Polish is that functional projections, so the predicates in the two clauses, are probes. This means that agree between predicates and the phonologically empty element or relative pronoun is bidirectional. The predicate in the main clause is a probe and its case value is a subset of the case value of the goal, which is the phonologically empty element. Here the derivation crashes. Since functional projections in German are not probes, this does not happen in German.

Just as Vogel and I do, Himmelreich makes use of the case scale. In Himmelreich's account, cases are features that can bear sets of case feature values. properties of Agree that differ vs. investigating the morphology of relative pronoun and light head, although she shows how the same set of Agree properties derives parasitic gaps in a particular language.

Empiricially, my analysis differs from the one of Himmelreich in that her account does not include unrestricted languages, such as Gothic. I also do not see how we can derive it. Himmelreich does include Modern Greek in her typology.

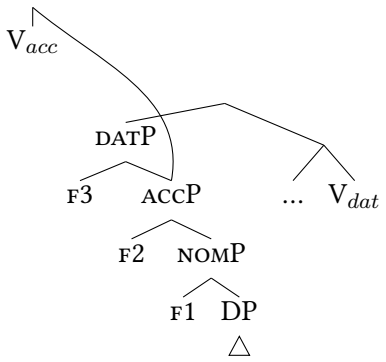
10.3 Multidominance approach

The last account I discuss is the one in Bergsma 2019. Just as the account in this dissertation, the account of Bergsma (2019) is embedded in Nanosyntax and adopts Caha 2009's case hierarchy: each case feature corresponds to its own head in the syntax and more complex cases syntactically contain less complex cases. The accounts differ in what they assume to be the underlying structure of headless relatives, how they model the difference between different languages and the languages they cover.

Bergsma (2019) assumes that in headless relatives there is only a single element involved in case competition, meaning there is no head present in the main clause, but only the relative pronoun in the relative clause. The idea is that a syntactic node within the relative pronoun is available for remerge, which I illustrate below with syntactic structures. The structures are not taken directly from Bergsma 2019 but they paraphrase what is in the paper and put details (mostly about the internal structure of the relative pronoun) aside for ease of explanation.

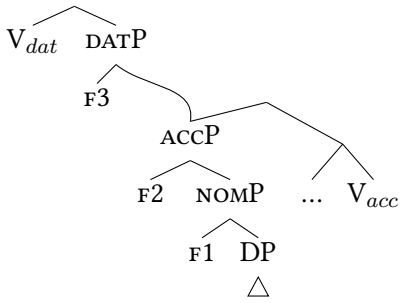
First I show a structure in which the internal case is more complex than the external case, here dative and accusative, given in (1). The relative clause on the right contains a predicate that takes dative case. The dative relative pronoun appears on the left edge of the relative clause. The predicate in the main clause takes accusative case. It is merged with the accusative case, which is a node embedded in the dative relative pronoun.

(1)



Next I give the structure in which the external case is more complex than the internal case, again dative and accusative, given in (2). The relative clause on the right contains a predicate that takes accusative case, which appears on the left edge of the relative clause. The predicate in the main clause takes dative case. The feature that makes the accusative into a dative is remerged with the accusative relative pronoun from the relative clause. The predicate from the main clause in turn is merged with the dative node.

(2)



In sum, the account in Bergsma (2019) can be described in three derivational steps. In step 1, the relative clause predicate merges with the required case node. In step 2, the relative pronoun moves to the left edge of the clause. In step 3, the main clause predicate merges with the required case node. When the required case node is available, as in (1), this node is remerged with the main clause predicate. When the required case node is not availabe, as in (2), the highest case node is remerged with additional case features following the functional sequence until the required case node is merged, and then the main clause predicate is merged with the required case node.

Variation between languages is formulated in terms of restrictions in step 3. A language without any restrictions is a language like Gothic: the relative pronoun always appears in the most complex case, no matter whether it is the internal or the external case.

A language like Modern German has a restriction that is described as *Keep spellout*:

additional case features can only be merged to the relative pronoun if this does not change the spellout of the relative pronoun. As a result, when the internal case is more complex, a node within the relative pronoun can be remerged. However, when the internal case is less complex and additional case features need to be merged on top of the relative pronoun, this is prohibited. An exception is when it does not affect the spellout, which is how Bergsma (2019) accounts for syncretic forms being able to resolve a mismatch.

A language like Polish has an additional restriction on top of the restriction that German has which is described as *Only remerge highest node*: only the structurally highest node can be remerged with the main clause predicate. As a result, when the internal case is more complex, an embedded node cannot be remerged with the main clause predicate. Since Polish also has the restriction *Keep spellout*, headless relatives with more complex external cases are also not grammatical, for the same reason as these being ungrammatical in Modern German.

Bergsma (2019) describes a fourth type of language, which is not described in this dissertation, which is a language like Modern Greek. This type of language only has the restriction *Only remerge highest node* and not *Keep spellout*. This means that headless relatives with a more complex internal case are not grammatical, for the same reason as the ones in Polish are not. When the external case is more complex, however, additional case features can be remerged with the relative pronoun. This works in the same way as for languages like Gothic for the nominative/accusative cases, but not for the cases involving a genitive. There we see the relative pronoun appearing in the case of the main clause and an additional resumptive pronoun in the embedded clause. In a derivation similar to the ones discussed so far, this would mean that the relative pronoun first appears in the genitive case. Then when the main clause predicate requires a less complex case, part of the relative pronoun moves away to a place lower in the structure and spells out as a resumptive. This leaves a relative pronoun of which the highest node can be remerged. The movement of the resumptive pronoun is atypical, but the restrictions *Keep spellout* and *Only remerge highest node* fit the described pattern well.

This account and the one in this dissertation have in common how they model the case hierarchy: cases are represented by different nodes in the syntax and less complex cases are syntactically embedded in more complex cases. What differs is how the two accounts model the differences between languages. This starts with the assumptions about the underlying syntactic structure of the headless relative. The account in Bergsma 2019 assumes that there is only a single element involved in case competition, which is the relative pronoun. Differences between languages follow from restrictions on whether the spellout of the relative pronoun can be changed and whether embedded features can be remerged. Unlike what is proposed in this dissertation, these differences do not follow independently from properties of the language. There is no evidence from the morphology or from other constructions in a language that tells us whether the language has these

restrictions, making them purely stipulative at this point. The account could be made stronger if there is evidence not from headless relatives that supports the need for the restrictions.

~~10.4 Summary~~

~~All of them refer in some way to a case scale. nom<acc<dat The interesting part is in comparing how they model the variation~~

~~There are differences in mechanics, but most importantly, there are differences in predictions.~~