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What counts as a gap? The case of typological hierarchies

Tabea Reiner

Abstract

The present contribution starts from two well-known theoretical concepts. One is Reis' meta-theoretical idea of realistic grammar; the other is Keenan & Comrie's Noun Phrase Accessibility Hierarchy. After introducing and discussing both concepts, I connect them by asking whether the notion of gaps in realistic grammar might include any non-accessibility of positions on the Noun Phrase Accessibility Hierarchy and on typological hierarchies more generally. As a case in point, I present a questionnaire study which confirms the usual assumption that OCOMP is not accessible for relativization in Standard German. On this basis, the general question will be answered in the negative: non-accessibility is *not* a gap. This answer then raises new questions, in particular: how can any non-accessibility of positions on typological hierarchies be accounted for in first language acquisition? I sketch a solution to this problem, the technical details of which are, however, left for future research.

Keywords

Realistic grammar, typological hierarchies, relative clauses, German, language acquisition

1 Introduction

As early as in 1979, Reis argued that we may not expect mental grammars to be exhaustive (Reis 1979, similarly: Reis 2017). In particular, rules might not always be readily applicable to a given structure. One of the standard examples for this situation involves problematic agreement in copula constructions, cf. (1).

- (1) Reis (1979: 9)
- | | | | | |
|-----|------------------|----------|-------|-------------|
| Das | Beweismaterial | ist/sind | drei | Tonbänder. |
| the | body of evidence | is/are | three | audio tapes |
- 'The body of evidence consists of three audio tapes/Three audio tapes constitute the body of evidence.'

Judging from the English translations alone, this seems to be no more than a case of structural ambiguity. However, according to Reis (1979: 9), speakers react to the *ist/sein*-alternative not by stating "depends on what you want to say" but by providing very mixed judgements including plain insecurity. This can be explained as follows, according to Reis (1979: 10–12). Grammatical rules typically come with a bundle of requirements, e.g., the agreement rule for German presupposes, among other things, that the subject NP has a clear number value and is the only nominative NP within the clause. The second one of these requirements is not met in (1) so that

the rule cannot apply – and given that there is no other applicable rule, speakers find themselves in a vacuum. In other words: their mental grammar leaves a gap.

Apart from the standard examples, however, one may wonder how broad the notion of gap is meant to be. For instance, consider a rule that produces grammatical output for some input but ungrammatical output for some other input – does the latter situation constitute a gap in some sense? A case in point is the possibility of relativizing subjects but not objects of comparison in German, cf. (2).

- (2) a. der Chihuahua, der kleiner ist als die Katze
the chihuahua which smaller is than the cat
‘the chihuahua who is smaller than the cat’
b. die Katze, als die der Chihuahua kleiner ist
the cat than which the chihuahua smaller is
‘the cat who the chihuahua is smaller than’

This is a language fact that, from a crosslinguistic perspective, can be covered by a typological hierarchy, more precisely by the well-known Noun Phrase Accessibility Hierarchy (Keenan & Comrie 1977, 1979a, b). So the general question addressed by the present contribution is this: do cut-off points on typological hierarchies constitute gaps comparable to those that Reis noticed?

The answer will clearly be in the negative but it will raise a number of new questions, concerning grammatical theory as well as first language acquisition. In more detail, section 2 provides a discussion of Reis’ theory (2.1) and an introduction to typological hierarchies (2.2), the latter including a case study on German relativization. The focus of the study will be on relativizing objects of comparison. By this stage, it will already have become obvious that, in principle, the two fields of study involve fundamentally different kinds of gaps. The question, however, is whether (not) relativizing objects of comparison constitutes an example of the former or the latter type of gap. Put, differently: are the data massively fuzzy, pointing to a gap in the sense of realistic grammar or do they indicate reasonably clear non-accessibility? It can be shown that the second possibility is the correct one and this result is then briefly summarised (2.3). However, it leaves the second kind of gap unexplained: how do speakers acquire the knowledge that one and the same rule yields ungrammaticality from some stage of a hierarchy onwards (2.4)? Or rather, which part of their knowledge produces the effect that grammaticality “stops” at some stage? Section 3 concludes.

2 Gaps of different kinds

2.1 Gaps in realistic grammar

Reis’ meta-theoretical conception sketched above in section 1 is known as REALISTIC GRAMMAR. The first important point to note is that it is a meta-theoretical framework indeed: it is not about the rules (these are provided by, e.g., some contemporary version of Generative

Grammar) but about where they fail. This has two consequences. First, realistic grammar presupposes a grammatical theory that rests on rules rather than probabilities of co-occurrence. In particular, the rules are supposed to be strict and exhaustive within grammar. There is no room for doubt. Second, realistic grammar permits leaving the rule-based theory of grammar intact while acknowledging that it does not cover the full range of speaker behaviour. Any doubts some speaker may have are outsourced to the extra-grammatical realm. In brief, grammatical rules leave gaps but do not help the speakers deal with them.

Against this background, the basic question of realistic grammar is where to draw the line between rule-guided and gap-driven speaker judgements. In other words: does a given set of very mixed speaker judgements require some adaption of grammatical theory or is it better explained by identifying an inherent gap in grammar? This question would be easy to answer if the theory was sure to be complete or, at least, there was a consensual and applicable criterion of completion (cf. also Vogel 2009: 320–321). In the absence of such a criterion, ancillary strategies have to step in. In the following paragraphs I intend to show that none of these strategies, as they are usually employed in realistic approaches, get rid of the need for completion, apart from one.

Strategy no. 1: identifying definitional gaps. Like in example (1), it happens that rules, as they stand, are not defined for a certain kind of input. In these cases, it might seem unlikely that the problem can be mended by adjusting the rules: which set of rules would predict exactly the mix of reactions we get, including plain insecurity? However, here is a suggestion for obtaining such a set of rules with respect to (1). First, the requirement that the clause contain no more than one nominative NP has to be dropped.¹ Second, a new rule is introduced: in case that there is more than one nominative NP, choose as the grammatical subject the one that makes the best topic (i.e. represents best what is being talked about). This rule is not to say that grammatical subjects are topics generally. Rather, it only applies to those cases of distinguishing the subject from the predicate nominal in which the usual tests are inconclusive or inapplicable for semantic reasons (for an overview of such tests, cf. Dolińska 2018: 83–87).²

As a result, all conceivable reactions to (1) can be captured: speakers who accept both options can picture both NPs as topics, speakers who accept neither option can picture neither NP as topic, speakers who prefer one of the options have a preference for one of the NPs as topic –

¹ This rule, as it stands, is too strong anyway: recall that every copula construction comes with two nominative NPs but not every copula construction involves problematic agreement. Moreover, if the two nominative NPs differ in number and one of them is an expletive (*sensu lato*) then there appears to be a crosslinguistic resolution rule: “The verb agrees with the expletive if and only if the expletive morpheme is not ambiguous with an object morpheme” (Cardinaletti 1997: 522). For German, this means that agreement is with the non-expletive NP, cf. (i).

(i) Eigentlich **sind** das **tolle Beiträge**.
 Actually are that great contributions
 ‘Actually, these are great contributions.’

² The best test might be the *gelten als*-Test, which seems to identify *drei Tonbänder* as the subject:

(i) Als Beweismaterial galten drei Tonbänder.
 (ii) ?Als drei Tonbänder galt das Beweismaterial.

However, (ii) may be acceptable in a context where it is unclear how to count an audio file consisting of three parts.

and those who are insecure simply cannot make up their minds on what is the best topic, which does not come as a surprise in the absence of any given context. In contrast, explicit statements of ambiguity are unlikely to the extent that the choice concerned here is a rather subtle one. This is a (sketchy) rule-based account of why speaker reactions to (1) are so diverse. Admittedly, this account contains a syntax/pragmatics interface but this does not make it any less rule-based. It could be tested by presenting examples like (1) in different contexts favouring different choices of topic: judgements should be clear then. If the account passes the test, it is an alternative to identifying a definitional gap in German copula agreement. More in general, i.e. with respect to any apparent definitional gap, the possibility cannot be excluded that the gap may be closed by redesigning the rules. Identifying definitional gaps, thus, makes sense only when the grammar has been completely determined.

Strategy no. 2: identifying gaps based on conflicting rules. Please note that this is not a mere subtype of strategy no. 1, i.e. identifying definitional gaps. In the case of strategy no. 1, there is no applicable rule whereas in the case of strategy no. 2, there are two (or more) applicable rules whose outputs, however, clash. This strategy can be demonstrated by studying another one of Reis' examples, also concerning agreement, cf. (3).

- (3) Reis (1979: 9)
 Ist/Sind Hans oder seine Eltern zu sprechen?
 Is/Are Hans or his parents to speak
 'Are Hans or his parents available?'

According to Reis (1979: 9), speakers' reactions to this example are, again, inconsistent. This observation can be traced back to a grammatical gap in not one but two ways. The option chosen by Reis is postulating another definitional gap, i.e. following strategy no. 1: agreement with coordinated subjects is defined only for coordinated subject NPs that are referentially plural (Reis 1979:10). Alternatively, one could argue that two rules are in conflict here: a) agreement has to be with each disjunct and b) agreement has to be with the disjunction as a whole.³ More precisely, the conflict is already inherent in a) and if it is resolved in favour of singular agreement, then there is a conflict with b). This seems to be a very clear instance of a grammatical gap identified based on conflicting rules. However, it may be the case that we are missing a semantic/pragmatic differentiation here, especially as the interpretation of OR in naturally occurring speech is still far from clear (e.g., Noh 2020). So the first step would be to test examples like (3) in the context of different answers, e.g., 'Yes, here are the three of them/Yes, here is Hans/Yes, here are Hans' parents'. It remains to be seen whether in this setting, judgements are clear so that a rule-based account of agreement with disjoined subjects would become feasible. Thus, again, the availability of a rule-based alternative to positing gaps hinges on the

³ The rules are from Himmelreich & Hartmann (2021), where they take the form of constraints in the sense of Optimality Theory (OT). The latter can be conceived of as a meta-theory that is related to but different from realistic grammar: both can account for mixed speaker reactions; however OT does so by constraint rankings, which can also be used for modelling homogenous judgements (more on OT below). In contrast, Haider's (2011) idea of grammatical illusions (i.e. utterances that are acceptable but not grammatical) complements realistic grammar in that illusions may hide gaps (Reis 2017: 265).

completion of our grammatical theory and, again, it is the grammar's interface to semantics and pragmatics that awaits (empirically grounded) completion.

Strategy no. 3: saying that a given rule does not leave a gap. Reis states quite clearly that a given rule R does not leave a gap iff for every conceivable application of R, it is clear whether the result is grammatical or ungrammatical (Reis 2017: 256). This is a welcome restriction of gap-based approaches. However, the set of conceivable applications cannot be determined before grammatical theory is completed.⁴ Even this strategy, then, requires the grammar to be complete in the first place.

Strategy no. 4: rule-guided behaviour = uniform behaviour. Whatever the final model of mental grammar may look like, the capacity thus modelled is assumed to be a secure guide for speakers (an assumption that stems directly from the kind of theories involved): an utterance is either judged grammatical or ungrammatical. So at least the conclusion can be drawn that really⁵ non-uniform speaker behaviour is not guided by rules of mental grammar. The reverse is not necessarily true: uniform speaker behaviour might have other sources than mental grammar (Botha 1973: 205). However, if uniformity is found across speakers and across experimental settings, then it seems likely that in at least some of the constellations those other (potential) sources were absent. Take as an example a set of minimally varying utterances that are all judged to be perfectly grammatical not only in forced-choice designs but also when using Likert scales (with or without a medium value) and/or neutral options ("I don't know"). Against this background, I take it that not only rule-guided behaviour implies uniform behaviour but also the other way round. This is a rationale that also Reis (2017) uses; in particular she employs the metaphor that grammar is "blind" to conditions beyond it (pp. 271–272) – a blind Lady Justice, to extend the metaphor.

Since strategy no. 4 is the only one that does not hinge on the completion of grammatical theory, I will use this strategy in the remainder of the present paper, in particular in sections 2.2.2 and 2.3. In addition, Reis (2017) uses a fifth strategy in order to evaluate rule-based accounts: is the account "convincing"? This means that the account a) neither over- nor under-generates and b) does not need ad-hoc devices (Reis 2017: 276). It seems to me that these requirements are self-evident and should apply to modelling the core (= grammar) and the periphery (= gaps) alike. So I will not use this strategy in distinguishing the domain of grammar from the domain of gaps.

Before concluding this section, it must be emphasised that my suggestions for rule-based accounts (cf. strategies no. 1 and 2) both involved an interface between grammar and semantics-pragmatics. One may argue that this is begging the question: like in gap-based accounts, the rules of grammar alone appear not to suffice. So strictly speaking, my above statements are not about completing our model of grammar but about completing our model of language as a

⁴ A reviewer remarks that this statement is tautological. Yes, it is. The tautology points exactly to the problem of completion, which was introduced at the beginning of the present section: telling apart gaps in mental grammar from gaps in our understanding of mental grammar.

⁵ That is, the same utterance in the same context under the same conditions is still not judged the same and there are no hints at systematic variation.

whole.⁶ In fact, the challenge remains the same: identifying the limits of rules. Put differently, it seems preferable to have a largely rule-based account of grammar and its interfaces rather than deliberately narrowing down one's perspective to grammar and being left with unnecessary gaps.

Having said this, even from the broader perspective advocated here, there might remain gaps, to be identified by strategy no. 4. The following section (2.2) presents such a potential gap, which is, however, identified as a non-gap, using said strategy.

2.2 A “gap” involving the Noun Phrase Accessibility Hierarchy as applied to German relativization

2.2.1 The Noun Phrase Accessibility Hierarchy

The Noun Phrase Accessibility Hierarchy (Keenan & Comrie 1977, 1979a, b) is one of the most well-known typological hierarchies, more precisely a syntactic typological hierarchy. A syntactic typological hierarchy is a set of categories ordered in such a way that a certain grammatical operation which applies to one of the categories also applies to all of the categories to its left; rarely the ordering is the other way round (Corbett 2010).⁷

With respect to the Noun Phrase Accessibility Hierarchy (Keenan & Comrie 1977, 1979a, b), the grammatical operation concerned is relativization. This hierarchy reads as follows.

- (i) subject > direct object > indirect object > oblique > genitive > object of comparison (Keenan & Comrie 1977: 66)

That is, if a given language can relativize, say, indirect objects, it will also be able to relativize direct objects and subjects. Or to take another example, if a language is known to relativize direct objects and obliques, then it is predicted to relativize indirect objects as well (but see below for a restriction on these examples). English has been shown to cover the whole hierarchy, down to objects of comparison, cf. (4)–(9).

- (4) The student who is presenting the paper...
[cf. The student presents the paper]
- (5) The paper which the student presented...
[cf. The student presents the paper]
- (6) The student to whom I lent the book...
[cf. I lent the book to the student]

⁶ Perhaps even involving processing; for representation vs. processing in (psycho-)linguistic theorising, cf. Lewis & Phillips (2015).

⁷ Corbett's (2010: 191) introductory example, the longstanding agreement hierarchy, can be read in both directions, depending on the dimension one is interested in: syntactic or semantic agreement. Regarding typological hierarchies in general, Corbett (2010) makes the additional claim of monotonicity, which I will not address here.

- (7) The book about which everyone is talking...
[cf. Everyone is talking about the book]
- (8) The student whose bike I borrowed...
[cf. I borrowed the student's bike]
- (9) The man who Mary is taller than...
[cf. Mary is taller than the man]⁸

(Corbett 2010:197)

Please note that only the nominal part becomes the head of the relative clause, cf. e.g., (7). The examples also give some hints at how the terminology is to be understood:

- oblique = adpositional argument⁹
- genitive = expression of possessor
- object of comparison = expression of the standard of comparison
(partly explicated by Keenan & Comrie 1977: 66)

According to these equations, genitive objects do not count as genitives but as something else (cf. section 2.2.2). Furthermore, genitives in the sense specified above generally correspond to constituents of constituents, as do objects of comparison. Subjects, direct objects, indirect objects, and obliques, by contrast correspond to maximal constituents.

Turning to the more basic terms *subject*, *direct object* and *indirect object*, Keenan & Comrie (1977) give very little information on how they use them. In their later paper, they admit with respect to all of the positions on the hierarchy: “We used these notions in their naive, more or less traditional meaning, assuming them to be given in advance by linguistic theory” (Keenan & Comrie 1979b: 650). They argue, however, that this limitation only constrains the applicability of the hierarchy, not its claims about those languages to which it is readily applicable (*ibid.*). Furthermore, they explicitly discuss problematic cases like Tagalog already in the original paper (Keenan & Comrie 1977: 75).

To my mind, even the seemingly straightforward application of the terms and the hierarchy to languages like English or German rests on a vague basis in certain cases. For instance, what is the subject in (1) above¹⁰ (cf. also the examples in Herbermann 1983: 25, 43)? Or why is it that both (certain) English *to*-PPs and (certain) German dative-NPs are easily identified as indirect objects? It does not seem to be common practice to explicitly discuss those questions when applying the hierarchy (note that neither labelling elements nor putting them into some

⁸ Also cf. the translation of example (2b) above.

⁹ It is not clear to me how locative and instrumental cases are counted. The Finnish and Russian examples in Keenan & Comrie (1979a: 335, 344) do not shed light on this issue.

¹⁰ In relativizing each subject candidate, I tend to use plural agreement in both cases:

- (i) das Beweismaterial, das drei Tonbänder sind
- (ii) drei Tonbänder, die das Beweismaterial sind

This intuition may count as an indication that *drei Tonbänder* is the real subject but my judgements might depend on the semantic-pragmatic conditions laid out in section 2.1 and would have to be checked on a broader empirical basis anyway.

position of a syntactic tree constitutes a real discussion). This is surprising against the background of ongoing discussions about the crosslinguistic (or even universal) applicability of linguistic terminology (e.g., Haspelmath 2010, Alfieri et al. 2021; but cf. as well Keenan’s 1976 own seminal work, which is also cited by Keenan & Comrie 1977, 1979b). For example, from today’s perspective one could define subjects as privileged syntactic arguments (PSA) in the sense of Van Valin & LaPolla (1997, ch. 6). This might admittedly make the Noun Phrase Accessibility Hierarchy partly redundant since one criterion for PSA-status is precisely relativizability (where it is restricted, unlike in English). In any case, such a move is far beyond the scope of the present contribution. So I will simply take Keenan & Comrie’s terms at face value, embracing all the problems this implies. In order to highlight this fact, I will refrain from using the terms *subject*, *direct object*,... in the rest of this paper but stick to Keenan & Comrie’s abbreviations:

(ii) SU > DO > IO > OBL > GEN > OCOMP (Keenan & Comrie 1977: 66)

Another note on terminology is in order here. So as to ensure the crosslinguistic applicability of at least the term *relative clause*, Keenan & Comrie define it largely on a semantic basis:

We consider any syntactic object to be an RC [= relative clause] if it specifies a set of objects (perhaps a one-member set) in two steps: a larger set is specified, called the domain of relativization, and then restricted to some subset of which a certain sentence, the restricting sentence, is true. (Keenan & Comrie 1977: 63–64)

The relative clause is then the syntactic object that accomplishes the semantic restriction. Importantly, only primary relativization strategies are considered in applying the hierarchy, i.e. those structures that languages use to relativize SUs (Keenan & Comrie 1977: 67–68). This is a deliberate decision by the authors in the light of empirical data; otherwise the predictions of the hierarchy would have become too strong (*ibid.*). However, they maintain that every language (to which the hierarchy is applicable) must have a primary strategy. Thus, in a nutshell, the final predictions of the Noun Phrase Accessibility Hierarchy are as follows:

- All languages can relativize SUs by some strategy.
- If a language can use the SU-strategy to relativize some other position on the hierarchy, it can use this strategy also for all positions to the left.
- Every position is a potential cut-off point.

For example, English was shown above to have no cut-off point at all although judgements concerning the lowest position, i.e. OCOMP, seem to be not as straightforward as those for the higher positions: (9) is judged to be “possible, even if somewhat forced” by Corbett (2010: 197).¹¹ German, by contrast, is usually said to have a cut-off point at precisely this position. This is the topic of the next section.

¹¹ However, there seems to be a requirement that *than* stays in situ: **than who he is taller* (Andrea Sims, p.c.).

2.2.2 Case study on German relativization

Question

If native speakers of German uniformly reject OCOMP-relativization, then this is a first hint at rule-guided behaviour (awaiting replication¹² in varied experimental settings). This is not to say that speakers have internalized typological hierarchies but that their single-language-specific rule of relativization...

- a. ...is defined for OCOMP as an input
- b. ...does not conflict with any other rule
- c. ...has a consistent output for OCOMP as an input, i.e.: ungrammatical.

That is, strategy no. 4 above is used as a proxy for what strategies no. 1–3 try to do (cf. section 2.1). Accordingly, if native speakers of German do *not* uniformly reject OCOMP-relativization, then this is a first hint at gap-driven behaviour, be it as a result of non-defined, conflicting, or otherwise dysfunctional rules. Against this background, the question is this: do acceptance rates change from total approval for GEN-relativization to total rejection for OCOMP-relativization – or are the results markedly fuzzier, making the (non-)accessibility of OCOMP a candidate for a gap in the sense of realistic grammar? An additional aim of the study is testing the basic assumption that OCOMP is hard to relativize in Standard German in the first place (to be found, e.g. in Lehmann 1984:213).

Method

In an online survey from 26 January to 7 February 2021, participants were asked to rate the following sentences, containing relative clauses in the sense of Keenan & Comrie (1977: 63–64).¹³

1. Paul ist 2,00m groß und ich kenne fast niemanden, der größer ist als er.
2. Peter ist nur 1,57m groß und ich kenne fast niemanden, den er überragt.
3. Paul ist 2,00m groß und niemand, dem man normalgroße Arbeitskleidung geben kann.
4. Peter ist nur 1,57m groß und beim Basketball niemand, an den man denkt.
5. Paul ist 2,00m groß und hat im Freizeitsport großen Erfolg, dessen er sich gerne rühmt.
6. Peter ist nur 1,57m groß, aber es gibt in seinem Leben keinen bösen Spott, dessen er sich entsinnen kann.
7. Paul ist 2,00m groß und niemand, bei dem man in der Wohnung viele Tritthocker vermuten würde.
8. Paul ist 2,00m groß und jemand, dessen Riesenschuhe man immer sofort erkennt.
9. Paul ist 2,00m groß und steht meistens neben jemandem, als der er größer ist.
10. Peter ist nur 1,57m groß und steht meistens neben jemandem, als der er kleiner ist.
11. Paul ist 2,00m groß, aber ich kenne jemanden, als der Paul kleiner ist.
12. Peter ist nur 1,57m groß, aber ich kenne jemanden, als der Peter größer ist.

¹² That is, conceptual replication as opposed to direct replication.

¹³ For glossing and English translations, cf. the appendix.

13. Paul ist 2,00m groß und er ist größer als so mancher, als der sonst niemand größer ist.
14. Peter ist nur 1,57m groß und er ist kleiner als so mancher, als der sonst niemand kleiner ist.
15. Peter ist nur 1,57m groß und besitzt einen Tritthocker, die Beine von dem man in der Höhe verstellen kann.
16. Paul ist 2,00m groß und ich kenne keinen Mann, der und Paul gleich groß sind.
17. Peter ist nur 1,57m groß und ich kenne keinen Mann, der und Peter gleich groß sind.
18. Paul ist 2,00m groß und wir kennen fast niemanden, der wir sagen würden, dass größer ist.
19. Paul ist 2,00m groß und wir kennen fast niemanden, den wir sagen würden, dass er nicht überragt.
20. Paul ist 2,00m groß und es gibt keinen Blaumann, an dem seine Kollegen sagen würden, dass die Hosenbeine lang genug sind.

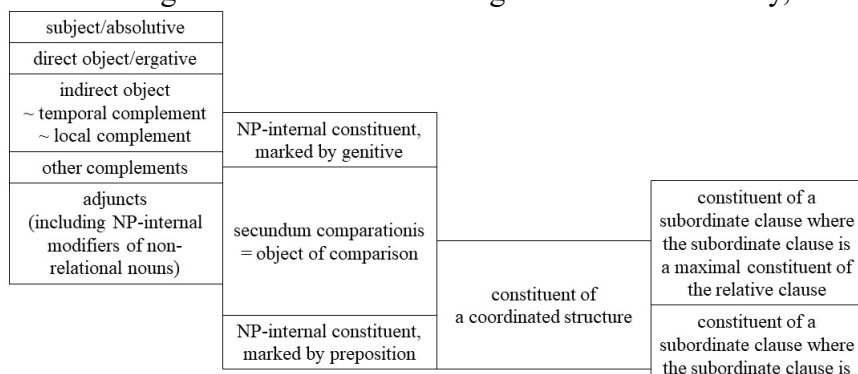
In all items, potential factors of variation are kept to a minimum: there are exclusively nominal (as opposed to pronominal) heads and the head noun is mostly an animate indefinite in the nominative or accusative case, e.g. *niemanden*. The remaining deviations from this ideal (as well as the in-built case variation) are due to striving for reasonably natural sentences. Moreover, features like animacy, definiteness, or case may well influence the choice of relativization strategies in the dialects and older stages of German but pertinent variation is virtually absent from the standard varieties (Pickl 2020: 245). The present study focusses on the latter.

The first eight items more or less represent the positions on the Noun Phrase Accessibility Hierarchy down to and including GEN. More precisely, sentences 1–3 simply cover SU, DO, and IO respectively, whereas some comments are in order with respect to sentences 4–8.

Since OBLs appear to be defined as adpositional arguments (cf. section 2.2.1), their most obvious German instantiations are NPs within so called *Präpositional-objekte*, i.e. prepositional phrases selected by the verb, e.g. [PP *an* NP] selected by *denken* ‘think’ in sentence 4 (Lederer 1969: 532–533). However, Fleischer (2004: 215) also includes verb selected genitive NPs here since these at least do not represent GENs (i.e. possessors). I adopt this extension for two reasons. First, I do not have a better idea on where to put verb-selected genitive NPs on the hierarchy. Second, the term *OBL(ique)* suggests that already Keenan & Comrie (1977) did not exclusively have in mind adpositional phrases. This is the *raison d’être* for sentences 5 (*sich rühmen* + genitive NP ‘to boast about sth.’) and 6 (*sich entsinnen* + genitive NP ‘to remember sb./sth.’). I doubled the pattern because verb-governed genitives are gradually falling out of use (Lenz 1998: 3–4) and I wanted to prevent a situation where the one verb I picked had maybe just begun to lose its genitive, thereby skewing the ratings.

Sentence 7 involves another PP (*bei dem* ~ ‘at whose place’) but does not represent OBL since the PP constitutes an adverbial rather than an argument of the predicate (*vermuten würde* ‘would expect’). I included this sentence as well as sentences 15–20, to be discussed below, for the following reason. There is a more elaborated version of the Noun Phrase Accessibility Hierarchy by Lehmann (1984: 219). This version, among other assets, covers more categories, including adjuncts like the adverbial in sentence 7. At the very least, I wanted to test some of these categories, too. This raises the question why the present contribution is based on Keenan’s

& Comrie’s original hierarchy rather than on Lehmann’s improved version. Admittedly, there are several arguments in favour of using Lehmann’s hierarchy, which is depicted in Figure 1.



First, Lehmann’s version of the hierarchy covers not only more categories but also deeper levels of embedding. Second, it is composed of three subhierarchies (plus one single category: constituent of a coordinated structure) and allows for some variation as to where these attach to each other. This appears to be empirically more adequate (Lehmann 1984: 215, 218–219). Third, Lehmann explicitly addresses some of the terminological problems mentioned above (p. 210). In particular, using the pair of subject/absolutive anticipates the notion of a PSA. In fact, the only reason why I used Keenan & Comrie’s (1977) original version of the hierarchy is that it is more widespread so that it has had the chance to stand the test of time and many researchers can relate to it.

This leads to sentence 8, which simply represents GEN in Keenan & Comrie’s (1977) sense, i.e. an expression of a possessor.

The following six items, i.e. sentences 9–14, all concern the expected cut-off point for German on Keenan & Comrie’s (1977) hierarchy: OCOMP. Since this is the critical category, I did not want its ratings to hinge on merely one or two questionnaire items and varied the conjunction as well as the proper name. In addition, I included two sentences (13 and 14) that also display the head noun in OCOMP function. This was motivated by Lehmann’s (1984: 221–222) observation that parallel function can improve acceptability. It should be noted, however, that this correlation is possibly restricted to languages or structures that overtly mark the pertinent (parallel) function on either the head noun or its representative in the relative clause (Lehmann 1984: 222). In sum, OCOMP is represented in the questionnaire by more items than any other category. Thus, to some extent, participants might “learn” the structure while completing the questionnaire. Together with the potential effect of parallelism this constitutes a slight advantage for OCOMP over the other categories.

The last six items, i.e. sentences 15–20, cover Lehmann’s categories from “NP-internal constituents, marked by preposition” leftwards and then downwards. So number 15 is an attempt at relativizing a prepositional NP-internal constituent, i.e. *von dem Tritthocker* (‘of the step stool’), yielding ...*Tritthocker, die Beine von dem man in der Höhe verstellen kann* (‘step stool

the legs of which can be adjusted in height’). Another, perhaps more natural, variant would have been ...*Tritthocker, von dem man die Beine in der Höhe verstellen kann*. However, this variant might have triggered an adverbial reading via coercion. Sentences 16/17 try to relativize a constituent of a coordinated structure, sentences 18/19 target a maximal constituent of a subordinate clause (subject and object, respectively), and, finally, sentence 20 targets an NP-internal constituent of a subordinate clause.

Throughout the questionnaire, the relativization strategy was kept constant. That is, I used only the primary strategy and only one of the two pronoun classes it allows, viz. *d*-pronouns (*der, die, das,...*) but not *welch*-pronouns (*welcher, welche, welches,...*). The reason for not using *welch*-pronouns was the fact that these are “used rarely [...and are...] stylistically marked as formal and unwieldy” (Pickl 2020: 245). Other strategies were ignored, e.g. the use of additional resumptives¹⁴ like in *ein Riese, wie Paul einer ist* (lit.: ‘a giant how Paul one is’).

In putting together the questionnaire(s), the twenty sentences were mixed with filler items and presented in rotated order. As for rating, there were three options:

- Ich bin mir sicher, dass dies KEIN deutscher Satz ist. (1 point)
‘I am sure that this is not a German sentence.’
- Ich bin mir nicht sicher, ob dies ein deutscher Satz ist. (2 points)
‘I am not sure whether this is a German sentence.’
- Ich bin mir sicher, dass dies ein deutscher Satz ist. (3 points)
‘I am sure that this is a German sentence.’

The non-forced-choice design ensures that potential insecurity on the side of the participants becomes visible: if there were only two options, it would be impossible to tell whether a given decision has been made confidently or, as Reis would have it, in distress.¹⁵

Pre-testing revealed that the questionnaire was too long. So I removed, quite unorthodoxly, the filler items. In spite of this move, another pre-test affirmed that the goal of the questionnaire had still not been recognized.

As for presentation of the questionnaire items, Figure 2 gives an impression.

Im Folgenden lesen Sie Äußerungen über zwei 45-jährige Männer, Paul und Peter. Beurteilen Sie für jede Äußerung bitte: Ist das ein deutscher Satz?

	Ich bin mir sicher, dass das KEIN deutscher Satz ist.	Ich bin mir nicht sicher, ob dies ein deutscher Satz ist.	Ich bin mir sicher, dass das ein deutscher Satz ist.
Paul ist 2,00m groß und es gibt keinen Blaumann, an dem seine Kollegen sagen würden, dass die Hosenbeine lang genug sind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peter ist nur 1,57m groß und er ist kleiner als so mancher, als der sonst niemand kleiner ist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paul ist 2,00m groß und niemand, bei dem man in der Wohnung viele Tritthocker vermuten würde.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

¹⁴ In Lehmann’s (1984: 45) sense: any pronominal element within the relative clause that represents the part which has been relativized. This includes relative pronouns as well as other pronouns, whether or not the latter stay in situ. A stricter notion of resumptives requires them to be personal pronouns in situ.

¹⁵ Reis’ (2017: 265) term is “Notstandsverhalten” (‘behaviour in distress’).

Results and discussion

Results

In total, I received 53 complete responses by native speakers, aged from 30 to 73, coming from diverse professional backgrounds. The sentence ratings are depicted in Figure 3.

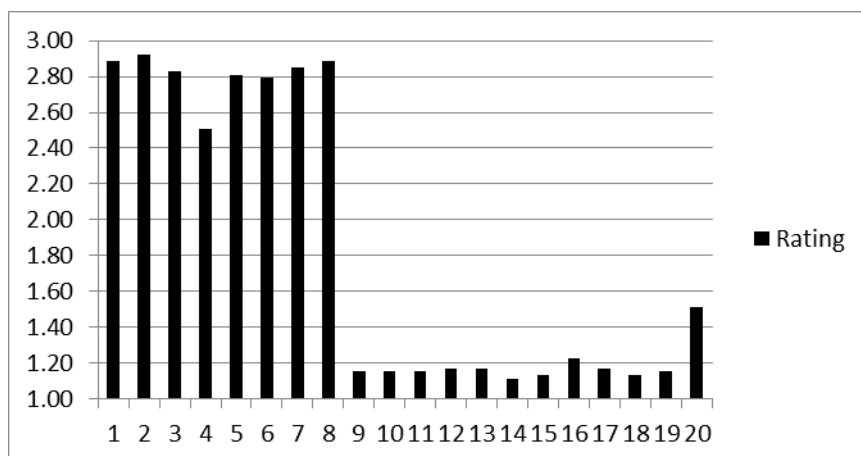


Figure 3: Average rating per sentence

The vertical axis shows the range of possible ratings, where 3.00 represents the highest and 1.00 the lowest possible score. The horizontal axis shows the sentence numbers. Recall that number 8 represents GEN while number 9 is the first sentence to represent OCOMP.

If all datasets from participants with obvious linguistic training are removed (8 out of 53), the results stay practically the same, cf. Figure 4.

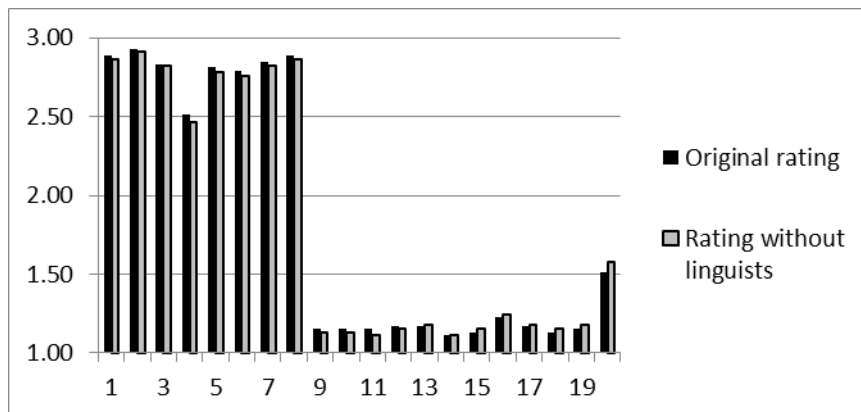


Figure 4: Average rating per sentence, with vs. without linguists

Considering how small the differences are, I decided to keep the datasets from linguistically trained participants. In particular, the evident break between the ratings of sentence 8 (GEN) and 9 (OCOMP) remains unaffected.

Discussion

The results presented in the previous subsection represent a good approximation to confirming the general view that German relativization stops at the last position of Keenan & Comrie's (1977) Noun Phrase Accessibility Hierarchy, this position being covered by sentences 9–14. The cut-off point becomes even more obvious if Lehmann's (1984) adjunct category, covered by sentence 7, is conceived of as slipping in between OBL (6) and GEN (8) while his additional categories as covered by sentences 15–20 are conceived of as continuing the original hierarchy. In particular, the latter's scores are, like OCOMP's scores, consistently close to rejection (see below for a discussion of sentence 20).

Put differently, the speakers polled behaved quite uniformly with respect to relativizing constituents with certain syntactic functions. However, "quite uniformly" is not the same as "uniformly". A truly uniform result would ideally have been one where sentences 1–8 receive the maximum score while sentences 9–20 receive the minimum score. Such a result would provide an unambiguous hint at rule-guided (vs. gap-driven) behaviour. Certainly, empirical data are rarely as clear-cut as needed for theoretical concerns. So the challenge is giving plausible explanations for the slight deviations from the ideal result. In the case at hand, especially sentences 4 and 20 are in need of explanation, the former being rated "too bad" and the latter being rated "too good". Also the remaining deviations have to be accounted for.

Sentence 4 contains a gapping structure *sensu lato* (i.e. the lacking of the finite verb + X), cf. (10).

- (10) Peter ist nur 1,57m groß
Peter is only 1.57m tall
und ~~Peter ist~~ beim Basketball niemand,...
and Peter is at.the basketball nobody
'Peter is only 1.57m tall and not someone to consider when it comes to basketball.'

This is the same in sentences 3, 7, and 8; however only number 4 has an additional constituent (*beim Basketball*) between the gap (~~*Peter ist*~~) and the remaining constituent (*niemand/jemand*). This fact might have complicated processing, causing the ratings to decrease slightly.

Sentence 20 poses more problems. Being in last position cannot explain its deviant rating since, generally, it was not in last position: recall that the order of items was rotated for each participant. A high willingness to extract constituents from (constituents of) complementizer clauses – a tendency which might be expected for Bavarian speaking participants (Bayer 1984: 209–210) – does not make a good explanation, either. For it would have improved sentences 18 and 19 as well. The only possibility seems to be the following. In the course of processing such a long sentence as number 20 (it is the longest within the questionnaire in terms of token numbers), a performance error slips in: participants only need to mistake *an* for *von* and suddenly a far simpler structure arises, i.e. the relativization of a (non-sentential) adjunct (*sagen von NP* – 'say about NP', cf. also sentence 7).

The rest of the deviations can be accounted for by general noise like accidentally clicking on another radio button than intended. Crucially, this also includes the results for OCOMP.

Although the OCOMP sentences had a certain advantage (potential learning effect, parallel condition), they were not rated “too good”. In particular, sentences 13 and 14, representing the parallel condition to the extent possible, do not stand out from the other OCOMP items. This result may count as a specific hint at rule-guided behaviour, controlled by grammar alone. Metaphorically speaking, the blind Lady Justice does not see the culprit’s exceptionally nice dress.

In sum, all deviations from a truly uniform result can be explained. Moreover, the middle option (‘I am not sure whether this is a German sentence.’) was only sparsely used, i.e. in 78 out of 1060 decision events. I conclude that the result can be treated as uniform, which indicates that relativization in German is guided by rules rather than driven by gaps.

As a caveat, however, I have to mention three shortcomings of the current study. First, I drew conclusions from accumulated data to mental grammar although the latter is something individual by definition, cf. Newmeyer’s (2003: 696) dictum that “we do not have ‘group minds’” as well as Dąbrowska’s (2020) argument to the same effect from a Cognitive Linguistics perspective. Second, I ignored dialects of German. OCOMP-relativization seems to be possible in Upper Hessian and at least one variety of Swiss German, cf. (11) and (12).

(11) Upper Hessian (Ralf Vogel, p.c., glossing and translation T.R.)

der man,
the man
wo ich schneller laufe kann als der
REL.PART I faster run can than DEM.3SG.M
‘the man who I can run faster than’

(12) Swiss German (Peter Gallmann, p.c.; glossing and translation T.R.)

de Maa,
the man
won i schneller cha lauffe alsäär
REL.PART¹⁶ I faster can run than he
‘the man who I can run faster than’

Note that both examples contain a relative particle (*wo(n)*) rather than a relative pronoun and that both show an additional in-situ pronoun, where at least the second one represents a resumptive *sensu stricto* (cf. footnote 14). The presence of an in-situ pronoun suggests that the strategy at hand is a non-primary one.

Third, apart from dialects I ignored other kinds of variation as well; a fortiori, I did not touch upon intra-individual variation (Werth et al. 2021).

¹⁶ Judging from the examples in Bräuning (2020), *won* is a phonological variant of *wo*, appearing before vowels.

2.3 Why non-accessibility does not count as a gap

From the discussion above, it follows directly that the non-relativizability of OCOMP etc. in Standard German is not a gap in the sense of realistic grammar. To summarise the reasoning: speakers behave virtually uniformly here, which indicates that their rule of relativization is defined for OCOMP etc., does not conflict with any other rule, and consistently returns “ungrammatical” when fed with the relevant categories. If the empirical results had been less uniform, the non-relativizability of OCOMP etc. would have been a candidate for a gap.

However, up to now I have not specified what a rule of relativization may look like (cross-linguistically or with respect to a single language) and how the information on category-dependent output might be represented. This is the starting point for the next section.

2.4 New questions

For the sake of simplicity, let’s devise a single-language rule for German relative clause formation, presupposing a mainstream generative framework but phrased informally:

1. Given a verb-last clause that is to become a relative clause, choose your future head noun from this clause.¹⁷
2. Delete this noun’s NP from the clause (as well as the complementizer).
3. Replace this NP by a pronoun from the *d-* (or *welch-*) series, according to its abstract morphological features, including syntactic function, e.g. *der* for SU.SG.M., *den* for DO.SG.M., *dem* for IO.SG.M.,...
4. Move this pronoun to SpecCP.

Applied to sentence 2 from the case study above:

1. dass er **niemand-en** überragt
that he nobody-DO towers.over
‘that he does not tower over anyone’
2. ~~dass~~ er **niemanden** überragt
3. er **den** überragt
4. **den** er überragt

Now the question is this: how to restrict this rule to the syntactic functions SU, DO, IO, OBL and GEN, excluding OCOMP as well as further categories? Note that the relativization of OCOMP in particular is not excluded by the rule as such. This becomes obvious by visualising the pertinent structure, cf. Figure 5.¹⁸

¹⁷ Pronominal heads are ignored here.

¹⁸ The omission marks in the upper left corner are from the original, the omission marks in the lower right corner are mine. I removed these parts since I assume that for purposes of the present contribution it is largely irrelevant whether comparative structures are inherently elliptical, which would require more structure down the tree than a non-elliptical analysis.

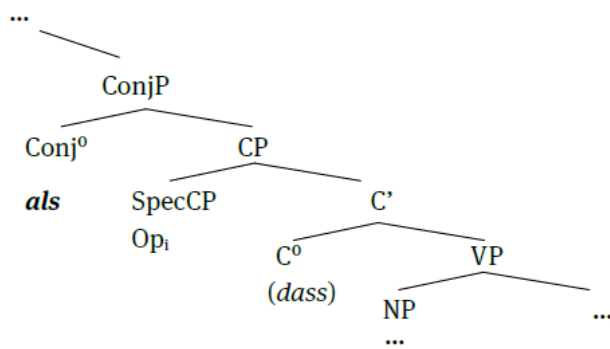


Figure 5: Jäger (2018: 456), shortened

The comparative particle *als* and the relative pronoun would not compete for a position since the former is located above SpecCP in Conj⁰.

A potential explanation for the lack of OCOMP-relativization in German and other languages is given by Zifonun (2001: 42–44): if the comparative marker does not govern case, then OCOMP cannot be relativized. For example, German *als*, a particle, blocks OCOMP-relativization while English *than*, a preposition, allows OCOMP-relativization. However, Geguchadze (2015: 49) shows that predicative phrases headed by *als* are accessible for relativization (note that *als* does not govern case here either). Thus, OCOMP-relativization does not per se hinge on the presence of a case governing comparative marker. Rather, Geguchadze (2015: 104) argues that the comparative marker must be connected to the standard of comparison *in some way*. Otherwise, she says, the morphosyntax would not be transparent enough to convey such a complex semantic operation as comparison. The idea seems appealing but cannot explain the failure of OCOMP-relativization in German: since *als* moves together with the rest of the phrase, a connection is in fact established (*als der Peter größer ist*). Thus, the puzzle remains: even if we do not start from a crosslinguistic rule, let alone assume typological hierarchies in speakers' minds, it is unclear how to account for the required restriction of relativization to certain syntactic categories in a given language. Put differently: while the validity of typological hierarchies may well be emergent from a range of cognitive factors like “comparison is complex”, any universal model of mental grammars has to account for why one language can cope with that complexity and the other cannot.

Perhaps the easiest answer would be one that states: in first language acquisition, absence of evidence is taken as evidence of absence. Then the non-occurrence of relativized OCOMP etc. in a child's German input would account for the restriction found in adult language. However, such a view on first language acquisition seems implausible in the light of classic nativist arguments to the effect that children understand and produce structures which they have never heard before (Grewendorf et al. 1987: 18–19). Even in the most recent constructionist study I am aware of, there are utterances which cannot be traced back to already learned patterns (Koch 2019: 249–250). Thus, the non-occurrence of relativized OCOMP etc. in a child's German input likely does not suffice to answer the question why these structures are banned in adult language.

Another answer would be: if two languages differ in that one allows a given syntactic function to be relativized and the other does not, then different rules or structures are involved.¹⁹ However, with respect to OCOMP-relativization in German vs. English, this seems implausible: the structures involved are the same in the relevant aspects and even the German-specific rule formulated above could be transferred to English when abstracting away from the morphological specifications.

Realistic grammar also offers an answer to the question of restricting relativizability. This might seem surprising in view of the fact that non-relativizability was argued not to be a gap in the case at hand. However, recall that realistic grammar treats non-gaps, too. Strategy no. 3 in section 2.1 said: a given rule R does *not* leave a gap iff for every conceivable application of R, it is clear whether the result is grammatical or ungrammatical (Reis 2017: 256). That is, the grammatical core of language (or some specific language) tells its users which input to a rule will return which output. For example, if in step 1 above a noun is chosen that is headed by a comparative particle, the grammatical core of German determines that the result of step 4 will be ungrammatical. However, this is just a description of the facts. Where precisely is this particular piece of information stored? More generally, where is information on the output of any given rule stored? It cannot be stored in the rule itself if we want rules to be overgeneralizable in principle – an assumption commonly made in research on first language acquisition. Thus, knowledge of grammatical vs. ungrammatical outputs must be stored somewhere else within the grammatical core, for example in second-order rules like “all features have to be checked” (which, however, does not help with accessibility). Since knowing the output of grammatical rules is essential to realistic grammar, it is surprising that little is said on its location within grammar.

Moreover, the question of where precisely the output of rules is stored within grammar is indirectly related to the question of drawing the line between grammar (or the domain of rules) and the rest (cf. section 2.1, i.e. the problem of completion. For it may happen that it is the output rather than the system of rules itself that escapes our latest understanding of mental grammar. An example might be provided by the debate around the German “Skandalkonstruktion” (Vogel 2009, Reis 2017: 272–280). This phenomenon can be sketched as follows: we find structure 1. where we would expect structure 2., judging from our previous knowledge of how verbal clusters are composed.

1. [lexical participle – auxiliary infinitive – *zu* modal infinitive]
2. [lexical infinitive – modal participle/IPP – *zu* auxiliary infinitive]

For example, we find *regiert haben zu müssen* (1.) instead of the expected *regieren gemusst/müssen zu haben* (2.), both meaning ‘to have been obliged to rule’. The question is whether the phenomenon is due to a definitional gap (IPPs are meant to appear in finite contexts next to the lexical verb: *hat regieren müssen*) or to some rule(s) yet to be discovered. This is not the place to settle the debate; however, I will outline Vogel’s (2009) original solution in order to show that a rule-based account is not as far-fetched as it may seem. The solution is

¹⁹ This idea is loosely based on Lightfoot (2020: 3–4).

based on two independently motivated assumptions: a) *zu* always attaches to the last verb of a given cluster b) ideally, word forms signal hierarchical relations, in particular, participles should be governed, not governing. The “Skandalkonstruktion” arises as an attempt to follow ideal b) under condition a). First, the misbehaved governing participle of the modal switches to the infinitive form, which is neutral as to government. The result is *regieren müssen zu haben*. However, this step was a disservice to the ideal of discernability: the string now consists of three infinitives. To fix the problem, the leftmost form is marked as being governed by means of participial morphology: *regiert müssen zu haben*. Government, then, is clearer if the governor appears right-adjacent to the governee (in a left-branching system). This yields *regiert zu haben müssen*. As a last step, condition a) states that *zu* must attach to the leftmost element, which results in the observed *regiert haben zu müssen*. Formally, Vogel implements his solution in an OT-framework. Having said this, Vogel’s rule-based solution might look very similar to Reis’ gap-based solution: it seems as if the only difference was that the former is based on conflicting rules whereas the latter is based on gappy rules (cf. strategies no. 1 and 2 above). However, it is essential to OT that for a given constraint ranking, conflicts between rules are solved in favour of one output or the other. In Reis’ realistic grammar, by contrast, the conflict remains unresolved, the gap unfilled.²⁰ This example shows how the problem of locating outputs and the problem of completion are interrelated.

Taken together, the two problems have consequences for the kind of question we ask our model of mental grammar. There are at least two kinds of question: a) “What is the output of rule R for input I?” and b) “Is structure XY possible in language L?”. In any completed grammar of the generative type, question b) can be reduced to question a): either there is an R capturing XY or there is no such R; in the latter case, XY is automatically classified as ungrammatical (Müller 2020: 510). In the (potential) absence of completion, however, the two questions are different and b) is the more general one to ask. It also circumvents the problem of locating and motivating outputs of grammatical rules.

Returning to the (non-)relativizability of OCOMP and further syntactic functions in languages like German, the question remains how this knowledge is acquired. The most explicit answer I can give at present is an attempt at modelling the acquisition of accessibility along the lines of Roberts (2019):²¹

²⁰ Also in OT, there are tied constraints, i.e. constraints that are not ranked with respect to each other (for an example of using tied constraints in modelling relative clause formation, cf. Salzmann & Seiler 2010). However, tied constraints model optionality, not confusion.

²¹ Note that the hierarchies in Robert’s (2019) title are other hierarchies than the ones dealt with in the present paper.

1. Universal grammar provides or from universal grammar can be derived:
 - a. A variable called PSA (see section 2.2.1 above)
 - b. A set of syntactic processes, including relativization
 - c. A silent feature A[non-PSA], read: apply a given process to non-PSAs
2. The input:
 - a. Specifies the PSA (e.g., nominative or absolutive argument)
 - b. Contains evidence on which processes are applied to the PSA
3. General cognitive principles:
 - a. Recognize applications of processes to non-PSAs
 - b. Evoke feature A[non-PSA] for the relevant processes and the relevant non-PSAs

This is not exactly the same as stating that absence of evidence is taken as evidence of absence since it is prespecified here what kind of observations (i.e. the application of processes to non-PSAs) is initially not expected by the child. So the restrictions on relativizability are tracked down to an inherent asymmetry between arguments interacting with asymmetries in the input (which is possibly shaped by historical accidents). However, the technical details of this approach are not worked out yet and I leave this to future research.

3 Conclusion

The present contribution explored the notional and practical boundaries of gaps in the sense of realistic grammar. On the one hand, the boundaries turned out to be quite clear: the non-accessibility of positions on typological hierarchies very likely does not count as a gap, provided that pertinent empirical results are always as clear as they were here with respect to the unavailability of OCOMP-relativization in German. Realistic grammar did not even help explain this impossibility if viewed decidedly as a non-gap. The reason was the problem of completion together with the problem of where to locate the output of rules in language modelling. So this “gap” had to be accounted for otherwise and I sketched what such an account may look like. On the other hand, it was argued extensively that already strategies for telling apart gaps from non-gaps have to be freed from the problem of completion: as long as there is the slightest possibility that our model of mental grammar is not complete yet, any dysfunctionality of rules does not directly indicate a gap but might be due to the rules being poorly formulated, in particular to the rules lacking empirical coverage. That the possibility of non-completion is real even for well-described languages like German was shown by alternative analyses for a selection of Reis’ (1979) own examples as well as by reference to Vogel’s (2009) “Skandalkonstruktion”. And if we are cautious with respect to identifying gaps in one of the best described languages of the world, we are cautious with respect to identifying gaps in any language.

Abbreviations

3	third person
ACC	accusative
DAT	dative
DEM	demonstrative
M	masculine
NOM	nominative
NP	noun phrase
PP	prepositional phrase
REFL	reflexive
PSA	privileged syntactic argument
REL.PA	relative particle
RT	
SG	singular
SpecC	specifier of complementizer
P	phrase

Glossing and English translation of questionnaire items

1. Paul ist 2,00m groß und ich kenne fast niemanden,
 Paul is 2.00m tall and I know almost nobody
 der größer ist als er.
 who.NOM taller is than he
 'Paul is 2.00m tall and I hardly know anyone who is taller than him.'
2. Peter ist nur 1,57m groß
 Peter is only 1.57m tall
 und ich kenne fast niemanden,
 and I know almost nobody
 den er überragt.
 who.ACC he towers.over
 'Peter is only 1.57m tall and I know almost no one he towers over.'
3. Paul ist 2,00m groß und niemand,
 Paul is 2.00m tall and nobody
 dem man normalgroße Arbeitskleidung geben kann.
 who.DAT one normal-sized work.clothes give can
 'Paul is 2.00m tall and not someone you can give normal-sized work clothes to.'
4. Peter ist nur 1,57m groß und beim Basketball niemand,
 Peter is only 1.57m tall and at.the basketball nobody
 an den man denkt.
 at who.ACC one thinks
 'Peter is only 1.57m tall and not someone to consider when it comes to basketball.'
5. Paul ist 2,00m groß und hat
 Paul is 2.00m tall and has
 im Freizeitsport großen Erfolg,
 in.the recreational.sport great success
 dessen er sich gerne rühmt.
 whose he REFL with.pleasure praises
 'Paul is 2.00m tall and has great success in recreational sports, which he likes to boast about.'
6. Peter ist nur 1,57m groß,
 Peter is only 1,57m tall
 aber es gibt in seinem Leben
 but it gives in his life
 keinen bösen Spott,
 no evil mockery
 dessen er sich entsinnen kann.
 whose he REFL recall can
 'Peter is only 1.57m tall, but there is no evil mockery in his life that he can recall.'
7. Paul ist 2,00m groß und niemand,
 Paul is 2.00m tall and nobody
 bei dem man in der Wohnung
 at who.DAT one in the flat
 viele Tritthocker vermuten würde.
 many step.stools expect would
 'Paul is 2.00m tall and not someone you would expect to have many step stools in his flat.'
8. Paul ist 2,00m groß und jemand,
 Paul is 2.00m tall and someone
 dessen Riesenschuhe man immer sofort erkennt.
 whose giant.shoes one always immediately recognizes
 'Paul is 2.00m tall and someone whose giant shoes are always instantly recognisable.'

9. Paul ist 2,00m groß und steht meistens neben jemandem,
 Paul is 2.00m tall and stands usually next.to someone
 als der er größer ist.
 than who.NOM he taller is
 'Paul is 2.00m tall and usually stands next to someone who he is taller than.'
10. Peter ist nur 1,57m groß und steht meistens
 Peter is only 1.57m tall and stands usually
 neben jemandem, als der er kleiner ist.
 next.to someone than who.NOM he shorter is
 'Peter is only 1.57m tall and usually stands next to someone who he is shorter than.'
11. Paul ist 2,00m groß, aber ich kenne jemanden,
 Paul is 2.00m tall but I know someone
 als der Paul kleiner ist.
 than who.NOM Paul shorter is
 'Paul is 2.00m tall, but I know someone who Paul is shorter than.'
12. Peter ist nur 1,57m groß, aber ich kenne jemanden,
 Peter is only 1.57m tall but I know someone
 als der Peter größer ist.
 than who.NOM Peter taller is
 'Peter is only 1.57m tall, but I know someone who Peter is taller than.'
13. Paul ist 2,00m groß und er ist größer als so mancher,
 Paul is 2.00m tall and he is taller than many a
 als der sonst niemand größer ist.
 than who.NOM otherwise nobody taller is
 'Paul is 2.00m tall and he is taller than some people who no one else is taller than.'
14. Peter ist nur 1,57m groß
 Peter is only 1.57m tall
 und er ist kleiner als so mancher,
 and he is shorter than many a
 als der sonst niemand kleiner ist.
 than who.NOM otherwise nobody shorter is
 'Peter is only 1.57m tall and he is shorter than many people who no one else is shorter than.'
15. Peter ist nur 1,57m groß und besitzt einen Tritthocker,
 Peter is only 1.57m tall and owns a step.stool
 die Beine von dem
 the legs of which.DAT
 man in der Höhe verstellen kann.
 one in the height adjust can
 'Peter is only 1.57m tall and has a step stool, the legs of which can be adjusted in height.'
16. Paul ist 2,00m groß und ich kenne keinen Mann,
 Paul is 2.00m tall and I know no man
 der und Paul gleich groß sind.
 who.NOM and Paul even tall are
 'Paul is 2.00m tall and I don't know any man who and Paul are equally tall.'
17. Peter ist nur 1,57m groß
 Peter is only 1.57m tall
 und ich kenne keinen Mann,
 and I know no man
 der und Peter gleich groß sind.
 who.NOM and Peter even tall are
 'Peter is only 1.57m tall and I don't know any man who and Peter are equally tall.'

18. Paul ist 2,00m groß und wir kennen fast niemanden,
 Paul is 2.00m tall and we know almost nobody
 der wir sagen würden, dass größer ist.
 who.NOM we say would that taller is
 ‘Paul is 2.00m tall and we know almost no one who we would say is taller.’
19. Paul ist 2,00m groß und wir kennen fast niemanden,
 Paul is 2.00m tall and we know almost nobody
 den wir sagen würden, dass er nicht überragt.
 who.ACC we say would that he not towers.over
 ‘Paul is 2.00m tall and we know almost no one who we would say he doesn’t tower over.’
20. Paul ist 2,00m groß und es gibt keinen Blaumann,
 Paul is 2.00m tall and it gives no blue.overall
 an dem seine Kollegen sagen würden,
 at who.DAT his colleagues say would
 dass die Hosenseite lang genug sind.
 that the trouser.legs long enough are
 ‘Paul is 2.00m tall and there is no overall on which his colleagues would say that the trouser legs are long enough.’

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