

Projection to the speaker: Non-restrictive relatives meet coherence relations

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1 Introduction

It is standardly assumed that non-restrictive relative clauses (NRCs) do not contribute to the meaning of the main clause, despite their embedded position. Rather, they are interpreted like independent sentences, outside the scope of all operators in the embedding sentence (Chierchia and McConnell-Ginet, 1990; Potts, 2005; Simons et al., 2011; Koev, 2013). For example, the NRC *who hates me* in (1) is embedded in a conditional clause. Nevertheless the sentence entails that the dean hates the speaker. That means that the proposition expressed by the NRC enters the semantic representation in the global context, outside the scope of the conditional, i.e. the NRC is interpreted *globally*. If the NRC were interpreted *locally* at its position inside the conditional, the sentence should be paraphrasable as ‘if Peter called the dean and if the dean hates me, ...’ However, this reading is not available in (1).

- (1) If Peter called the dean,
 who hates me, [\rightsquigarrow The dean hates me.]
 I would be in trouble. (adapted from Schlenker, 2013, p. 7)

This wide-scope behavior of NRCs has received a number of theoretical accounts. Syntactic accounts (e.g. McCawley, 1982) argue that NRCs are attached high in the syntactic tree (at CP-level or discourse level), i.e. occur outside the scope of operators like *if* in (1) not only semantically, but also syntactically. Another group of accounts assumes that NRCs are syntactically embedded, but that their content is not interpreted in its embedded position but *projected* to the global context, either because it constitutes a separate dimension of *semantic* meaning (e.g. not-at-issue content in Potts, 2005), or because it has a different *pragmatic status*, being pragmatically not-at-issue (Simons et al., 2011), evoking an immediate Common

Ground update (AnderBois et al., 2011), or having its own illocutionary force (Koev, 2013). All these accounts predict that NRCs invariably receive global interpretation, i.e. contribute a proposition outside the scope of all semantic operators in the sentence.

However, Schlenker (2013) has recently pointed out a number of puzzling examples from English and French, in which the NRC appears to receive a local interpretation. For example, the NRC in (2) does not necessarily commit the speaker to the assumption that the dean already called the chair.

- (2) If Peter called the dean,
who then called the chair, [↗ The dean called the chair.]
I would be in trouble. (adapted from Schlenker, 2013, p. 7)

However, the conditions that license such local readings are poorly understood. The main goal of this paper is to find the generalization that best describes the projection pattern of NRCs, and to move towards a better theoretical understanding of this phenomenon. We will start in section 2 by giving a brief overview over the contrasts reported by Schlenker (2013) and recapitulating related experimental results of Poschmann (2018), which both point towards a dependency of NRC scope on coherence relations. In section 3, we will review some ideas on what could stand behind these observations, and argue that the availability of local readings cannot be reduced to the syntactic differences between appositive and continuative relative clauses described by Holler (2005) or to anaphoric trapping in the sense of van der Sandt (1992). On the basis of the observations accumulated up to that point, most notably, the apparent tendency of NRCs to be interpreted locally if they are connected to their host clause by a coordinating coherence relation like *Narration* or *Contrast* (in contrast to subordinating relations in the sense of Asher and Vieu, 2005), section 4 will finally motivate a change of perspective upon the problem: Instead of taking projection from NRCs as the normal case and explaining local readings, we will take local interpretation as the default, and try to explain projection within the observed limits. In section 5 we will argue ultimately that NRCs project only if they are speaker-oriented, and that they are speaker-oriented only if the speaker's attitude towards the content of the NRC is either explicitly marked or the NRC is connected to the context by an implicit speaker-oriented coherence relation. We will show that the distinction between speaker-oriented vs. non-speaker-oriented coherence relations describes better the conditions for global vs. local interpretation of NRCs than subordinating vs. coordinating relations.

2 Local Readings

2.1 Local readings are local readings

We agree with Schlenker (2013) that examples such as (2) provide a strong argument for the assumption that NRCs can be both syntactically and semantically embedded. His argument is twofold. Firstly, he shows that NRCs can have truly local, not only modally subordinated readings. The NRC in (3) does not tell us that the dean called the chair (*global reading*), it does not even have the reading that in any case in which Peter called the dean, the dean would call the chair (*modal subordination reading*), it really seems to have the reading that the speaker would be in trouble on two conditions: if Peter called the dean and if the dean called the chair (*local reading*), which is comparable to the reading of a local conjunction.

- (3) If Peter called the dean, **who then called the chair**, I would be in deep trouble.
- a. ↗ The dean called the chair. *global*
 - b. ↗ If Peter called the dean, the dean would call the chair. *modal subordination*
 - c. ↘ If Peter called the dean and (if) the dean called the chair, ... *local*

Secondly, he argues that NRCs in this respect differ structurally from the corresponding parenthetical or matrix-clause paraphrases. Note that the sentence receives no local interpretation and the past tense is no longer bound by the conditional if the NRC is replaced by a parenthetical (4-a) or a postposed matrix clause (4-b).

- (4) a. ??If Peter called the dean (**he then called the chair**), I would be in deep trouble.
- b. If Peter called the dean, I would be in deep trouble. ??**He then called the chair.**

(Adapted from Schlenker, 2013, 7)

This indicates that the NRC in (3) is indeed interpreted locally. In other words, contrary to standard assumptions (Chierchia and McConnell-Ginet, 1990; Potts, 2005; Simons et al., 2011; Koev, 2013), the projection pattern of NRCs seems to be flexible in nature.

2.2 Local readings are not always available

As Schlenker (2013) concedes, local readings are not always readily available. The acceptability of the NRC in (1) degrades considerably if we try to force the NRC under the scope of the conditional by setting the NRC's verb in the past tense as in (5-b).

- (5) a. If Peter called the dean, **who then called the chair**, I would be in deep trouble.
b. ??If Peter called the dean, **who hated me**, I would be in deep trouble.

(Adapted from Schlenker, 2013, 7)

But why should a local reading be available with (5-a) and not with (5-b)? (5-a) and (5-b) differ at least in (i) the *predicate-type* of the NRC (state/event) and (ii) the presence/absence of the *anaphoric expression* 'then'. In addition, Schlenker (2013) remarks that (iii) the NRCs in (5-a) and (5-b) establish different *coherence relations* to their host clause. While in (5-a) the event described in the NRC follows in time the event described in the antecedent of the *if*-clause and the NRC, hence, establishes a *Narration* relation with its host clause, the NRC in (5-a) seems to provide an *Explanation* for the proposition asserted in the rest of the sentence that the speaker would be in trouble if Peter called the dean.

Note that *Narration*, according to Asher and Vieu (2005), is a coordinating coherence relation while *Explanation* is a subordinating one.¹ Informally, in coordinating relations (*Contrast*, *Parallel*, *Narration*) the discourse units are on a par and the discourse progresses in a normal left-to-right fashion, whereas subordinating relations (*Elaboration*, *Explanation*) lead to hierarchical structures and discourse embedding, and do not "push the discourse forward". As Asher and Vieu (2005) highlight, this distinction is crucial for explaining how the discourse progresses and how anaphoric relations are resolved. Therefore, it seems like a sensible hypothesis that the contrast in (5) is due a contrast between coordinating vs. subordinating coherence relations expressed by the NRC.

¹According to this classification coordinating coherence relations include *Narration* (temporal sequentiality), *Result* (forward causal relation), *Parallel* (similar states of affairs), and *Contrast* (opposite states of affairs, argument-counterargument relation, denial of expectation). Subordinating relations include *Elaboration* (subordinate segment gives more detail), *Explanation* (subordinate segment presents the cause of the event or the reason to believe the statement) and *Background* (subordinate segment describes the background state of the event).

In three experiments on German, Poschmann (2018) tested the availability of local readings depending on several factors such as the sentence type (NRC/ parenthesis/ and-conjunction/ postposed matrix clause), the NRC's predicate type (event/ state) and the coherence relation between the NRC and its host-clause (subordinating/ coordinating). In her experiments, each item consisted of a little context-story and a target sentence and the participants had to judge whether the target was appropriate as part of a summary of the information given by the story. The stories were constructed such that the wide-scope reading and a modal subordination reading of the target sentences were explicitly ruled out. For example, the target sentences in (6) were presented in a context in which Gerd got bitten by a poisonous snake and only can be saved if he reaches Dr. Meier and Dr. Meier gives him the right antidote. The context made clear that we do not know, whether Gerd can be saved even if he reaches Dr. Meier, since it is unclear whether Dr. Meier has got the right antidote available. Thus, if the participants only got a wide-scope or modally subordinated reading, according to which Gerd is saved as soon as he reaches Dr. Meier (because in this case Dr. Meier will for sure inject him the right antidote), they were expected to reject the target as part of a summary of the context. Only if the participants interpreted the NRRC as contributing conjunctively to the antecedent of the *if*-clause (such as the conjunction in (6-b)), were they expected to accept the target sentence as a summary of the context-story. (6-a) to (6-c) give an example for a test item with event predicate type in three of the clause type conditions of experiment 1. In the second experiment, NRCs were contrasted with postposed matrix clauses (*Der ihm das Gegengift verabreicht.* / *'He gives him the right antidote.'*)

- (6) Wenn Gerd rechtzeitig Dr. Meier erreicht, (...)
'If Gerd reaches Dr. Meier in time, (...).'
- a. **der ihm das passende Gegengift verabreicht,**
'who gives him the right antidote, (...).' (NRC)
 - b. **und der ihm das passende Gegengift verabreicht, (...).**
'and he gives him the right antidote, (...).' (conjunction)
 - c. **(der verabreicht ihm das passende Gegengift), (...).**
'(he gives him the right antidote), (...).' (parenthesis)
- '... kann Gerd gerettet werden.'*
'can Gerd be saved.'

In addition, Poschmann (2018) manipulated the predicate type (event vs. state) of the target sentences in all the three experiments.

- (7) a. (...), der ihm das passende Gegengift **verabreicht**, (...) (NRC event)
 'who gives him the right antidote'
 b. (...), der über das passende Gegengift **verfügt**, (...) (NRC state)
 'who has got the right antidote'

In the first two studies, the items were constructed so that they did not contain discourse markers or anaphors which could force a particular reading. However, the most salient discourse relations for the event type were *Narration/Result* (coordinating) and for the state type *Explanation/Background* (subordinating). In *Narration/Result*, the occurrence of the event in the NRC was dependent on the event in the matrix clause, which might favor an embedded interpretation. Therefore, experiment 3 only tested NRCs in which either a *Contrast* or a *Narration* interpretation (both coordinating) was forced, by inserting either *dann* ('then') or *wider Erwarten* ('against expectations').

- (8) a. (...), der ihm (**dann / wider Erwarten**) das passende Gegengift verabreicht, (...) (NRC event)
 'who (then / against expectation) gives him the right antidote'
 b. (...), der (**dann / wider Erwarten**) über das passende Gegengift verfügt, (...) (NRC state)
 'who (then / against expectation) has got the right antidote'

The results of all three experiments clearly show that NRRCs indeed can be interpreted as embedded but that the availability of embedded readings is dependent on factors such as the predicate type of the NRC and the absence or presence of discourse marker. In the first two experiments, the participants accepted the NRCs with event predicates in around 50% of all cases, less often than the corresponding conjunctions (around 90%), but significantly more often than the matrix-clause-parenthesis (20%) or postposed matrix clauses (10%). NRCs with state predicates, by contrast, rated nearly as low (25%) as the corresponding matrix-clause parenthesis. In experiment 3, however, where a coordinating discourse relation was forced, either by introducing an anaphoric *dann/then* (*Narration*) or a contrastive *wider Erwarten/against expectations* (*Contrast*), the acceptance rate increased dramatically (up to 85%) even for NRCs with state predicate type. These results suggest that NRCs are indeed flexible in scope and that the projection-pattern of NRCs is affected by the coherence relation. Marking a coordinating discourse relation improves the embeddability even for NRCs of state predicate type.

3 Possible (Non-)Explanations

Why should the type of coherence relations, holding between the NRC and its host clause, affect the scope of the NRC? Before we try to give an answer to this question, we will investigate two alternative explanations for the reported contrasts in this section. Neither gives a satisfactory account for the observed projection data.

3.1 Appositives vs. Continuatives

The observations by Schlenker (2013) and Poschmann (2018) are particularly interesting for German. For independent reasons like differences in position effects and intonation contours, Holler (2005) argues that there are two structurally distinct types of non-restrictive relative clauses in German, so-called *appositive* and *continuative* relative clauses, which differ in their predicate-type, position, coherence relation as well as in their syntactic attachment point (DP- vs. CP-level). At first sight, the restrictions on local readings observed by Schlenker (2013) and Poschmann (2018) fit quite nicely the characteristics described in Holler (2005) for continuative relative clauses. Continuative relative clauses establish a coordinating relation (in the sense of Asher and Vieu (2005), such as *Narration*, *Result*, *Contrast*) with their host clause and typically relate two events. Typically, the event described in the host-clause precedes the event in the continuative relative in time. In contrast, appositive relative clauses express a subordinating discourse relation and are rather flexible in their predicate-type as well as in the temporal order described. According to Holler (2005), the NRCs in (5-a) and (7-a) are continuatives and the NRCs in (5-b) and (7-b) appositives. The first idea that comes to mind is that the effects we observe reflect the structural differences between continuative and appositive relative clauses, which only allow continuatives to have local readings.

We have two reasons to doubt this explanation. First, Poschmann (2018) reports that state predicates disfavor but do not exclude local readings. As soon as a coordinating relation is forced, local readings improve with event as well as with state predicate type. However, according to Holler (2005) state predicates should block continuative readings. Second, the structural analysis suggested by Holler (2005) does not really account for the reported contrasts. Holler (2005) assumes that appositives are attached at DP-level, while continuatives are attached high in the syntactic tree (CP-level/discourse level). But this predicts that only appositives (if anything) can get local readings, while continuatives should necessarily be interpreted globally. However, we observe just the reverse pattern.

3.2 Trapping

Another hypothesis, suggested e.g. by Martin (2016), is that the contrasts reported by Schlenker (2013) could be due to trapping the anaphors occurring in the NRC in the scope of the conditional. Most of Schlenker's examples of locally interpreted NRCs include anaphoric expressions such as *then* referring back to the proposition or event described by the host-clause. Martin (2016) suggests that the contrast between (5-a) and (5-b) is due to the need to bind the anaphoric *then* in (5-a), which only finds an appropriate antecedent (the event of Max calling the dean) in the scope of the conditional—a solution parallel to van der Sandt's (1992) trapping for anaphors and presuppositions. Compare examples (9-a) and (9-b) of van der Sandt (1992, p. 332): In (9-a) the presupposition that John has a wife, triggered by the possessive *his*, can neither be bound by nor accommodated in the global context, since this would make the sentence incongruent (#John has a wife and if he has a wife ...). The antecedent of the conditional, however, provides a suitable antecedent for the presupposition and therefore can bind it locally. Similarly, the personal pronoun *she* in (9-b) is bound by *a wife*, which blocks a specific interpretation of the personal pronoun.

- (9) a. If John has a wife, his wife will be happy.
b. If John has a wife, she will be happy.
(van der Sandt, 1992, 332)

Could the local readings of NRCs be reduced to anaphoric trapping? In this case we would predict that: (a) NRCs project if there is no anaphor to trap; and (b) if there is an anaphor to trap, i.e. if the sentence has a coherent interpretation only if the anaphor is resolved to an antecedent in the conditional, then a local reading should be available. Both predictions, however, are wrong.

Concerning (a), Poschmann's experiments (2018) show that inserting a temporal *dann/then* may improve the availability of local readings, especially in the case of NRCs of state predicate type, but local readings are available even in the absence of such temporal anaphoric expressions.

- (10) a. Wenn Gerd Dr. Meier erreicht, der ihm (dann) das passende Gegengift verabreicht, kann Gerd gerettet werden.
'If Gerd Dr. Meier reaches, who (then) gives him the right antidote, Gerd can be saved.'
b. #² Wenn Gerd Dr. Meier erreicht, der (dann) über das

²Unsuitable in a context that rules out a global reading of the NRC

passende Gegengift verfügt, kann Gerd gerettet werden.
'If Gerd Dr. Meier reaches, who (than) has got the right anti-
dote available, Gerd can be saved.'

As an anonymous reviewer correctly observes, the examples in (10) contain an anaphoric link between the NRC and the host-clause even if the temporal *dann* (*then*) is omitted, since the relative pronoun *der* (*who*) refers back to *Dr. Meier*, the antecedent of the NRC. However, since *Dr. Meier* is a proper name, which by itself is interpreted globally (independently of the conditional sentence in which it occurs), it cannot force the NRC inside the scope of the conditional. Instead, one might expect it to piggy-back the NRC in the sense of Venhuizen et al. (2014) and force it to project to the global level. That this is not happening shows once more that anaphoric trapping is too weak to account for the scopal behaviour of NRCs.³

This argument could perhaps be countered by Zeevat's (2016) recent extension of trapping from anaphoric identity to causal relations. He suggests the following generalization: "If the presupposition is inferred to be caused by or identical with a referent that is given by a non-entailed clause in the sentence, it does not project" (Zeevat, 2016, p. 16). In (11), for example, the factive verb *stopped* triggers the presupposition that Mary used to eat snails. Although this presupposition is not entailed the antecedent of the *if*-clause, it does not project, but is interpreted locally. Zeevat (2016, p. 16) argues that in this case the presupposition is bound inside the conditional by the inference that being French causes, i.e. increases the probability of a person eating snails.

- (11) If Mary is French, she has stopped eating snails.
[↗ Mary used to eat snails.]

Applying this reasoning to (10), Gerd reaching Dr. Meier increases the probability of Dr. Meier giving Gerd the antidote. That is, the NRC has a causal antecedent in the *if*-clause, and should not project. Likewise, the dean in Schlenker's example (3) probably only calls the chair, if he has been called by Peter. In both cases the "NRC is presented as being a consequence of the content of the antecedent of the *if*-clause" (Schlenker, 2013, p. 42). In contrast, whether or not Dr. Meier has got the antidote available in (10-b) does not depend on Gerd reaching him, and whether or not the dean hates the speaker does not depend on Peter calling the dean (5-b). In

³The same holds for Schlenker (2013)'s original examples in (2), where the antecedent of the NRC is a definite noun phrase, which again is interpreted globally, while the NRC itself is interpreted locally. This clearly shows that the scope of NRCs is independent of the scope of its antecedent.

both cases, the NRC need not be bound by the conditional, and therefore projects. In other words, it seems that Zeevat's causal version of trapping can explain Schlenker's examples and Poschmann's experimental results, on the assumption that propositions contributed by NRCs are treated in the same way as presuppositions.

However, it turns out that local readings are available even without any causal or standard identity-based anaphoric relation of the NRC to the conditional antecedent. For instance, the coherence relation in (12) can be understood as *Parallel*, which implies no causal or even temporal relation between the clauses it connects. Nevertheless, the NRC is interpreted locally in the scope of *if*:

- (12) If Mary stands in front of Peter, who (first/then/also) moves a little closer to Max, everyone will fit into the picture.

This means that trapping, no matter if in van der Sandt's classical version or Zeevat's causal version, is too weak and does not predict local readings of NRCs in some cases, like (12), where they are obviously present.

On the other hand, trapping is also too strong. Prediction (b), that the NRC should be interpreted locally if it contains an anaphoric expression that can only be resolved to an antecedent in a non-entailed context, is falsified by example (13). The pronoun *him* in the NRC can be bound by the indefinite *someone* in the *if*-clause. The resulting interpretation makes sense and can be felicitously expressed by a conjunction under *if*, cf. (13-b). Nevertheless, this reading is not available for the NRC in (13-a).

- (13) If someone₁ wears this jacket,
a. #which is too big for him₁,
b. and it is too big for him₁,
he will look silly.

In other words, trapping goes a long way in explaining Schlenker's and Poschmann's examples, but ultimately breaks down in the face of new counterexamples.

4 Taking stock and changing tack

We saw in the previous section that neither a structural approach of Holler (2005), nor an approach based on local binding, parallel to the trapping of presuppositions, predicts the observed (non-)projection pattern of NRCs. We have also seen examples supporting the hypothesis formulated by

Poschmann (2018), that an NRC is interpreted locally if its relation to the host clause is coordinating: *Narration* in (5-a) and *Parallel* in (12). Local readings of NRCs that express other kinds of coordinating coherence relations—*Contrast* and *Result*—are exemplified in (14) and (15), respectively.

- (14) If Sue stays married to Max, who *nevertheless* continues his affair with Jim, they will regret it in the end.
- (15) Wenn Eva Max kritisiert, der sich *deshalb* ärgert, dann ist die Stimmung im Eimer.
'If Eva criticizes Max who for that reason gets annoyed, then the party mood is ruined.'

In sum, the mapping of projection to discourse-structural subordination and local interpretation to discourse-structural coordination appears to be the best approximation of the observed pattern so far. The problem with this generalization is that it is rather mysterious. Why would coordination/subordination have anything to do with projection?

We believe that the relationship between these two dimensions is indirect and can be described by the following generalizations:

- (16) a. NRCs project whenever they are *speaker-oriented*.
b. NRCs tend to express subordinating coherence relations.
c. NRCs that express subordinating coherence relations tend to be speaker-oriented.

In the rest of this paper we concentrate on the generalization (16-a). The notion of *speaker-orientedness*, which it refers to, was originally applied to adverbials like *unfortunately* and *frankly* in 'Unfortunately/Frankly, Ed fled' (Potts, 2005, pp. 14–16), since they characterize the speaker's attitude towards the content of the clause they modify: The speaker deems it unfortunate that Ed fled; the speaker frankly utters the sentence *Ed fled*. In this paper we carry over the notion of speaker-orientedness from the adverbials to clauses they modify, and more generally, to clauses that express propositions towards which the speaker holds an attitude and that attitude is communicated somehow—by a speaker-oriented adverbial or some other conventional or pragmatic means. To test for speaker-orientedness one can follow up the sentence with an explicit denial of the attitude towards the proposition expressed by the clause in question, which will result in an infelicitous continuation if the clause is speaker-oriented (Potts, 2005, p. 117). For instance, (17) shows that the relative clause is speaker-oriented, whereas the complement clause 'Chuck

... should be locked up' is not.

- (17) Sheila believes that Chuck, who is a confirmed psychopath, should be locked up.
- a. #But I don't believe he is a psychopath.
 - b. But I don't believe he should be locked up.

The speaker's attitude may be that of belief, desire, intention, etc. or any combination thereof (although belief is the one we will have to deal with most in connection with projection from NRCs).⁴ This requires the presence of an appropriate attitude operator in the semantic representation, which must either be linguistically realized, or convincingly motivated, if implicit. Then the generalization in (16-a) can be formulated more precisely as in (18):

- (18) If the proposition p expressed by the NRC is in the semantic scope of an operator O that encodes the speaker's attitude to p , then $O(p)$ projects.

Notice that this implies a change of perspective upon the problem. The dominant view so far has been that NRCs *always* project *because* they are speaker-oriented as a matter of linguistic convention, or by definition of the type of semantic content they convey (conventional implicature in Potts, 2005). So it would seem that the challenge is to explain the exceptions presented by Schlenker (2013). We take a different tack. We assume that non-restrictive relatives are just like other subordinate clauses in that they are generally interpreted in their syntactic position.⁵ On this

⁴To a limited extent, the role of the speaker can be played not only by the actual speaker of the utterance, but also by the subject of a speech or attitude verb, as in indirect speech or attitude reports, or by a perspectival center in free indirect discourse (Harris and Potts, 2009). For instance, in (i) the negative attitude towards the content of the NRC can be attributed to Mary, in which case the NRC can be interpreted in the scope of Mary's belief. However, it is not that the NRC is simply interpreted locally. It projects past the conditional, but just until it encounters a context with a "pseudospeaker" that can be the holder of the attitude expressed by the speech act adverbial.

- (i) Mary believes that if Peter called the Dean, who **unfortunately** hates her, she would be in trouble. But I don't think this is so unfortunate.

⁵We follow Poschmann (2018) in assuming that NRCs are normally attached at their host DP (Heim and Kratzer, 1998), but in extraposed position can be attached at higher sentential nodes — e.g. at IP-level. This ensures, for instance, that the NRC in Schlenker's example (i) can take intermediate scope—under *if*, but above the quantifier *every* and negation.

approach, local readings do not require any special explanation. The challenge is to explain why NRCs project, and our central claim is that they project *if* they are speaker-oriented.

The generalizations (16-b) and (16-c) in turn address the question why NRCs project *most of the time*. For reasons of space we cannot discuss this issue in detail here. In Authors (2018), we summarize the results of corpus studies that suggest that there is a statistical tendency for an alignment between hierarchical structures in syntax and in discourse. That is, syntactically subordinate clauses, and NRCs in particular, tend to realize subordinating coherence relations, cf. (16-b). On the other hand, unlike other kinds of subordinate clauses, relative clauses do not normally encode a semantic relation between the propositions expressed by the main and the relative clause. While adverbial clauses are projected by expressions like *when, because, although*, etc. that explicitly encode such a relation (temporal, causal, concessive, etc.), which then enters compositional semantics in the usual way, relative clauses establish a connection to the main clause via a shared participant of the described situations (e.g. the Dean in (1)), the relation between the situations or propositions themselves remains to be pragmatically inferred. The general pragmatic principles that apply in that case are the same as those at work in the inference of coherence relations between independent sentences. But those principles, as we argue in Authors (2018), mostly lead to the inference of what we call *speaker-oriented coherence relations*. Altogether, this results in the tendency of NRCs to be speaker-oriented (16-c).

Having said that, we now come back to (16-a) and the role of the speaker's attitude in the projection behaviour of NRCs.

5 Speaker-orientedness

In this section we argue that NRCs are not speaker-oriented by definition or due to some general conventional rule, but only under a number of well-defined conditions: (a) if some linguistic expressions present in the sentence independently signal the speaker's attitude; or (b) if the speaker's attitude towards the proposition expressed by the NRC results from the position of the NRC in the discourse structure. Condition (a) might appear obvious. Nevertheless it is useful to look at the case of

(i) If each of the faculty had mentioned the fact that he didn't like the Chair, who had gotten fired as a result, we would now feel terrible.

(Schlenker, 2013, p. 17)

explicitly marked attitudes first, in order to better understand the cases of type (b). We also show that speaker orientation is *a priori* independent of discourse-structural coordination/subordination, i.e. that there are speaker-oriented NRCs that realize a coordinating relation, and they project, and that there are non-speaker-oriented NRCs that realize a subordinating relation, and they are interpreted locally.

Speaker-oriented adverbials: The speaker’s attitude towards a proposition can be expressed by speaker-oriented adverbials (Ernst, 2009). The most clear case is that of speech act adverbials and discourse particles such as the English *frankly* and *by the way*, or the German *ehrlich gesagt*, *offenstanden*, *übrigens*. These expressions mark the proposition they modify as something the speaker says, e.g. *frankly* $p \approx$ ‘the speaker says frankly that p ’, *by the way* $p \approx$ ‘the speaker says p although it is not related to the current discourse topic’. Therefore the speaker must be committed to p to the same extent as to anything he or she says.

Note that sentence (3) is infelicitous if such speaker-oriented adverbials are inserted. The local reading forced by ‘then’ and the forward-shifted past-tense is simply incompatible with the global interpretation as an independent speech act.⁶

- (19) If tomorrow Peter called the Dean, who then (*frankly/*by the way/...) called the Chair, I would be in deep trouble.

Epistemic/evidential and evaluative adverbials can also force projection, but what is projected is not necessarily the proposition they modify (p), but the attitude O described by the adverbial towards that proposition: $O(p)$. Whether the speaker is also committed to p depends on the nature of O . For instance, the relative clause in (20) without the adverbials can be interpreted in the scope of *if*, as a further condition on turning Sue’s room into a living room ($[A \wedge B] \rightarrow C$). Inserting the evidential *allegedly* or the evaluative *unfortunately* makes this interpretation impossible. The proposition *alleged*(B) or *unfortunate*(B), respectively, is projected: *alleged/unfortunate*(B) \wedge $[A \rightarrow C]$. However, *alleged* is a non-factive predicate, which, moreover, explicitly marks the speaker’s non-

⁶The compatibility with speech act adverbials is often used as a test whether or not a relative is non-restrictive. Some people, hence, doubt that the examples such as (3) or (19) are indeed non-restrictives (Koev, 2013; Martin, 2016). This seems quite odd, considering the fact that the relative in these examples is attached to definite heads or proper names, which ensures a non-restrictive interpretation. In view of examples like (19), we should rather ask ourselves what these tests are disambiguating, restrictive and non-restrictive readings or local and global ones.

commitment to B , whereas *unfortunate* is factive, leading to the effect that the speaker is committed both to the proposition that Bill moved to the former kitchen and to the evaluation of this fact as unfortunate: $B \wedge \text{unfortunate}(B) \wedge [A \rightarrow C]$.

- (20) If Sue moved to Bill's room, A
 who (*allegedly/unfortunately*) moved to the former kitchen, B
 then Sue's room could become the new living room. C

In (20), the coherence relation between A and B is *Parallel*, the clauses describe who moved or would move where—similar events with varying participants (cf. the definition of *Parallel* by Kehler, 2002). As was already mentioned, *Parallel* is a coordinating relation, nevertheless the NRC is interpreted globally if an appropriate speaker-oriented adverbial is present. Contrary to the hypothesis in Poschmann (2018), this suggests that projection is the effect of the adverbial rather than the type of coherence relation in this case.

Speaker-oriented discourse connectives: Adverbials like *allegedly* and *unfortunately* take one propositional semantic argument. Discourse connectives take two propositional arguments, and some of them are also speaker-oriented, i.e. indicate that the speaker holds an attitude towards one or both of those propositions. The subjectivity dimension in discourse connectives is best studied in the domain of causal markers (Sweetser, 1990; Sanders and Sweetser, 2009). The difference between speaker-oriented and non-speaker-oriented causal markers can be illustrated by the German *deshalb* vs. *also*. The contrast between $A \text{ deshalb } B$ and $A \text{ also } B$ is roughly as between the paraphrases 'A, and for that reason B' and 'A, and for that reason I believe B', respectively.

- (21) a. Eva hat Max kritisiert. *Deshalb* ärgert er sich.
 'Eva criticized Max. That's why he is annoyed.'
 b. Eva hat Max kritisiert. *Also* ärgert er sich.
 'Eva criticized Max. So he is annoyed.'

This difference maps to a contrast in projection behaviour. As expected, *deshalb* favours local interpretation. In (22), *deshalb* makes sure that the NRC is interpreted inside the conditional: The mood will be ruined if two things happen—Eva criticizing Max and Max getting annoyed, where the first causes the second. In contrast, *also* makes the NRC project, but the causal antecedent of the speaker's belief that Max is annoyed is not acces-

sible in the global context,⁷ therefore (22) is less felicitous with *also*. However, *also* is fine in (23), where the causal antecedent for *also* is found in the previous sentence ‘The meeting lasted 6 hours.’

- (22) Wenn Eva Max kritisiert, der sich *deshalb*/?*also* ärgert, dann ist die Stimmung im Eimer.
‘If Eva criticizes Max, who [Ger. *deshalb/also*] gets annoyed, then the party mood is ruined’
- (23) Die Sitzung hat 6 Stunden gedauert! Wenn wir Peter, der *also* ziemlich müde gewesen sein muss, gefragt hätten, ob er auf ein Bier mitkommt, hätte er bestimmt abgesagt.
‘The meeting lasted 6 hours! If we had asked Peter, who [Ger. *also*] must have been quite tired, to come along for a beer, he would have refused.’

Notice again, that the NRC is attached to the context by a coordinating coherence relation, and nevertheless projects, like in example (20) above. Both *deshalb* and *also* express a *Result* relation, however, *deshalb* encodes a causal relation at the event level, whereas *also* encodes a causal relation between epistemic states of the speaker, which makes the NRC speaker-oriented.

Speaker-oriented coherence relations: The contrast between speaker-oriented and non-speaker-oriented discourse connectives extends to coherence relations more generally (Sanders, 1997). That is, the understood relationship between two clauses may or may not involve or be based on the speaker’s attitude to the content of one or both of the clauses, no matter if that attitude is signalled by an appropriate linguistic expression (e.g. a speaker-oriented connective), or remains implicit. In the latter case, figuring out what kind of relationship the speaker must have had in mind is a matter of pragmatic inference.

What we refer to here as speaker orientation corresponds closely to a well established parameter in most of the existing taxonomies of coherence relations. Sanders et al. (1992) call this parameter the *source of coherence* and distinguish between *semantic* and *pragmatic* relations. ‘A relation

⁷Some speakers interpret the relative clause as a consequence of the potential situation of Eva criticizing Max, but not as part of the condition for ruining the mood. The sentence can then be paraphrased as: If Eva criticizes Max, then he will be annoyed (I conclude) and the mood will be ruined. This requires projection followed by modal subordination in the consequent of the conditional, similar to a potential modally subordinated readings of (3-b).

is semantic if the discourse segments are related because of their propositional content. In this case the writer refers to the locutionary meaning of the segments. The coherence exists because the world that is described is perceived as coherent.' (Sanders et al., 1992, p. 7.) For instance, a causal relation between the events in (21-a) is in this sense a manifestation of coherence in the real world, and the connective *deshalb* expresses a semantic coherence relation. In contrast, 'a relation is pragmatic if the discourse segments are related because of the illocutionary meaning of one or both of the segments. In pragmatic relations the coherence relation concerns the speech act status of the segments. The coherence exists because of the writer's goal-oriented communicative acts.' (Sanders et al., 1992, p. 8.) In this sense, the coherence relation expressed by *also* in (21-b) is a causal relation between two assertions. A similar distinction between *ideational* and *pragmatic* relations is made by Redeker (1990). Mann and Thompson (1988) in turn distinguish *subject matter* vs. *presentational* relations: 'Subject matter relations are those whose intended effect is that the reader *recognizes* the relation in question; presentational relations are those whose intended effect is to *increase some inclination* in the reader, such as the desire to act or the degree of positive regard for, belief in, or acceptance of the nucleus.' (Mann and Thompson, 1988, p. 257.) This is not the same distinction as Sanders et al.'s source of coherence but overlaps substantially with it.

In this paper, we assume a somewhat weaker notion of speaker orientation than both Sanders et al.'s pragmatic source of coherence and Mann and Thompson's presentational category. Whenever the coherence relation implies that the speaker holds an attitude to one or both of the discourse segments the relation is speaker-oriented. We do not commit to the assumption that this must necessarily result from the segment having its own illocutionary force, which is a condition that follows from Sanders et al.'s definition of pragmatic relations. However, if it does have an illocutionary force, then the speaker necessarily holds an attitude towards its propositional content, e.g. belief in the case of an assertion. Similarly, it is not necessary for a speaker-oriented coherence relation that one segment is intended to affect the hearer's attitude towards the other, as is the case for Mann and Thompson's presentational relations. However, if a relation is presentational, then it is also speaker-oriented, because the speaker expresses the *desire* that the hearer holds a particular attitude towards the content of one segment, and *presents* the other segment with the *goal* to affect that attitude, which implies that it has an illocutionary force. Therefore the speaker holds an attitude towards both segments, so the relation is speaker-oriented.

Our main claim is that in the cases where the coherence relation by which an NRC is connected to its context is not explicitly marked, and there are no other linguistic cues that force projection (such as speaker-oriented adverbials), its projection behaviour will depend on the inferred coherence relation. If a speaker-oriented relation is inferred, the proposition expressed by the NRC is attributed to the speaker and therefore projects. For instance, this is the case in examples (1) and (10-b), repeated below as (24) and (25), as well as in (26), a variant of (13), where the un-specific indefinite *someone* is replaced by a definite *Peter*. In all the three cases, the conditional as a whole is more plausible with than without the NRC. That is, the conditional probability of ‘if *A* then *C*’ given *B* is higher than the unconditional probability of ‘if *A* then *C*’, which is a case for a speaker-oriented *Explanation** relation (or *Evidence* Asher and Lascarides, 2003, p. 162), where the subordinate segment gives the reason to believe the superordinate one: *Explanation** (‘if *A* then *C*’, *B*).⁸

- | | | |
|------|---|-------------------------|
| (24) | If Peter called the Dean,
who hates me,
I would be in trouble. | A
B
C |
| (25) | Wenn Gerd Dr. Meier erreicht,
der über das passende Gegengift verfügt,
kann Gerd gerettet werden.

'If Gerd reaches Dr. Meier, who has the right antidote,
Gerd can be saved.' | A
B
C

 |
| (26) | If Peter wears this jacket,
which is too big for him,
he will look silly. | A
B
C |

In all these cases the coherence relation unpacks to something like: The speaker asserts *B* to make ‘if *A* then *C*’ more plausible to the hearer. This entails in the first place that the speaker asserts *B*, that is, the speaker is committed to *B* as to anything she asserts.

If a non-speaker-oriented relation is inferred between the NRC and its host clause, such as *Parallel* in (12) or *Narration* in (10-a), repeated below,

⁸While it is usually assumed that the coordination/subordination feature classifies coherence relations, that is, for instance, *Explanation* is always subordinating, and *Contrast* is always coordinating, the speaker orientation feature “crosscuts” coherence relation, so we get a speaker-oriented and a non-speaker-oriented version of the same relation. We adopt the *-notation (e.g. *Explanation**) used in Segmented Discourse Representation Theory (SDRT, Asher and Lascarides, 2003) for a narrower category of metatalk relations to indicate that a speaker-oriented version of the relation is meant.

the NRC is interpreted locally.

- (27) If Mary stands in front of Peter,
who moves a little closer to Max,
everyone will fit into the picture. *Parallel*
- (28) Wenn Gerd Dr. Meier erreicht,
der ihm das passende Gegengift verabreicht,
kann Gerd gerettet werden. *Narration*
- ‘If Gerd reaches Dr. Meier, who gives him the right antidote,
Gerd can be saved.’

There is not much to say about these cases. Nothing special forces a global interpretation here, no speaker-oriented adverbial or connective, no speaker-oriented coherence relation, so the NRCs are interpreted in their syntactic position as any other subordinate clause.

Finally, the following example shows that an NRC connected to its host clause by a subordinating but non-speaker-oriented coherence relation is also interpreted locally. The *Elaboration* in (29) is an instance of such a relation. Strictly speaking, this is an instance of *Entity-Elaboration (E-Elaboration)*. “Normal” *Elaboration* holds between two descriptions of the same eventuality. *E-Elaboration* gives a more detailed description of an entity mentioned in the first sentence. In (29), the NRC provides details on the content of Bill’s email, mentioned in the conditional clause.

- (29) If you get an email from Bill, who writes that he got a new job,
don’t trust it.

Obviously, the sentence does not imply that Bill does or will write that he got a new job in any case, or if the addressee gets his email. The NRC contributes a further condition in the scope of *if*. This shows once again that local vs. global interpretation of NRCs depends primarily on speaker orientation, rather than on discourse-structural subordination.

6 Conclusion and Outlook

In this paper we set out to investigate the conditions under which non-restrictive relative clauses can have local readings. We have found additional evidence for Schlenker’s (2013) and Poschmann’s (2018) view that a major factor determining whether an NRC is interpreted locally or globally is the coherence relation by which it is attached to its host clause or

broader context. Furthermore, we have shown that some ideas circulating in the community and in the literature towards a theoretical explanation of this phenomenon do not prove fruitful in the face of new observations that we have presented. In particular, although Holler's (2005) syntactic account of continuative vs. appositive relative clauses at first glance seems to be sensitive to just the right feature of coherence relations—discourse-structural coordination vs. subordination—for embedded NRCs it predicts a pattern exactly opposite to the observed one. Similarly, an attempt to treat local readings of NRCs by analogy with the trapping of presuppositions along the lines of van der Sandt (1992) and Zeevat (2016) both generates unwanted local readings in some cases, and fails to predict attested ones in other cases.

Although we believe that the actual pattern is approximated rather well by Poschmann's (2018) generalization that NRCs attached to their host clauses by coordinating coherence relations tend to be interpreted locally, and otherwise globally, we have argued that this relationship must be indirect. Crucially, it is not coordination/subordination, but rather Sanders et al.'s (1992) source of coherence—the opposition between speaker-oriented and non-speaker-oriented coherence relations—that has a direct link to NRC scope. In particular, if an NRC is connected to its host clause by a non-speaker-oriented coherence relation it can be interpreted locally (even if the relation is subordinating), and if the NRC is speaker-oriented it is interpreted globally (even if its relation to the host clause is coordinating).

One of the most radical conclusions of our study is perhaps that NRCs must be interpreted locally by default, just like other kinds of subordinate clauses. In order for an NRC to be interpreted globally, speaker orientation must be either explicitly indicated by an adverbial or connective, or it must follow from a speaker-oriented coherence relation. The idea is that in all these cases an appropriate attitude operator anchored to the speaker takes scope over the proposition contributed by the NRC.

However, this approach still leaves open the most crucial question. Why are NRCs interpreted globally, i.e. as speaker-oriented, most of the time? Why does it take so much effort—setting up the context right and introducing explicit markers—to make the local, i.e. continuative/non-speaker-oriented interpretation accessible? For reasons of space we could not pay due attention to this question. Some more detailed discussion of this issue can be found in Authors (2018), although it largely remains a task for future research.

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