Rhetorical Relations

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Rhetorical Relations

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> In accord with the tradition of using idiosyncratic terminology, I will call them "coherence relations".
>
> *On the Coherence and Structure of Discourse*, Jerry R. Hobbs (1985)

1 What is a rhetorical relation?

Let us start with an illustration. Below is a joke from the show *Right Wing Comedian* performed by the Britisch stand-up comedian Leo Kearse at the Edinburgh Fringe Festival 2018.[1] Obviously, this is not an arbitrary sequence of utterances. The listener or reader immediately recognises that the utterances hold together forming one meaningful whole. The way the utterances are related can be characterised in rational terms. In (1-a), Kearse's character states that he has sympathy for Donald Trump, and the subsequent clauses (1-b)-(1-f) provide an explanation of why he feels that way. Different parts of that explanation are also interrelated. (1-b) and (1-c) do no more than telling a story of Trump's presidential campaign, that is, they represent events taking place in a sequence. (1-d) represents an unexpected twist in the story: Trump winning the election against his own attempts not to (1-c), as also signaled by the contrastive conjunction *but*. (1-e) then presents a consequence, or result of Trump's victory (1-d). Finally, (1-f) draws a parallel between Trump's presidential campaign experience in the sequence (1-b)-(1-e) and the speaker's own experience of applying for jobs.

(1) a. I've got some sympathy for Trump.
b. He went for a job,
c. tried to throw the interview
d. but accidentally got it
e. and now he hates it.
f. Reminds me of every interview I had for jobs I didn't want when I was on benefits.

We say that the different parts of the discourse in (1) are connected by means of *rhetorical relations* (henceforth RRs) such as *Explanation, Narration, Contrast, Result* and *Parallel*. The *rhetorical structure* of the discourse is represented schematically in Figure 1.

More generally, the identification of RRs is a way (one way) to characterise the coherence of text and discourse. In the past three decades, research on RRs has come up with a variety of frameworks which differ in terms of both definition and inventory of RRs (cf. e.g. Hovy

[1] Cited at https://inews.co.uk/light-relief/humour/donald-trump-jokes-comedians/.

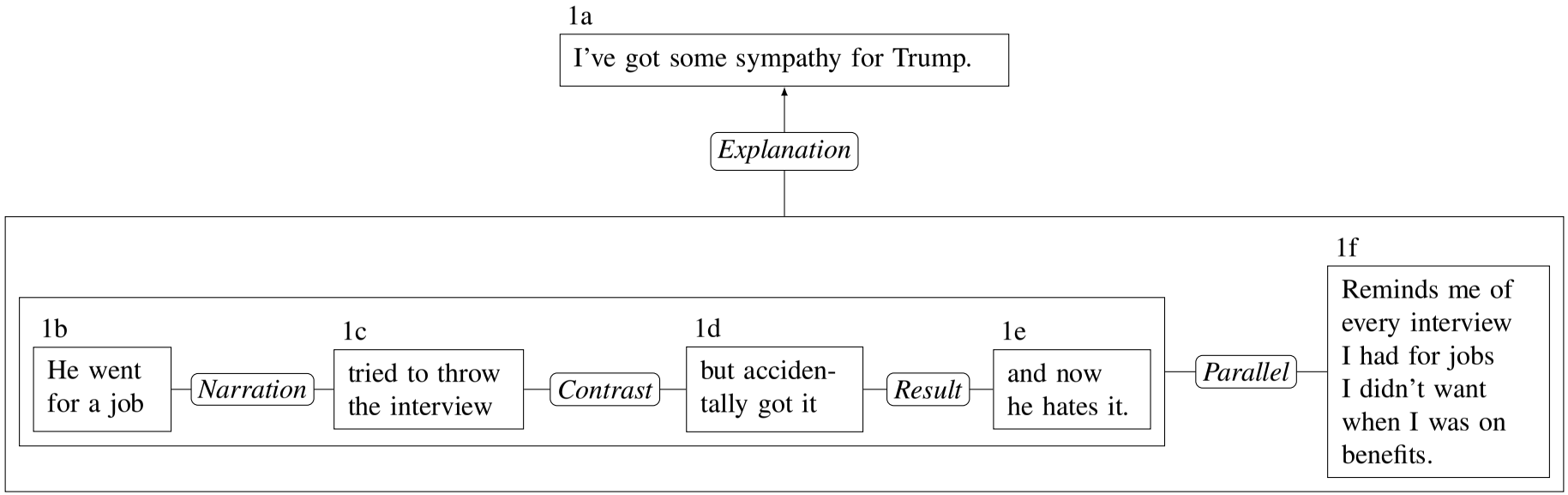

Figure 1: Discourse structure for (1)

and Maier, 1995). One of the first influential approaches to the study of discourse as a whole as a valid linguistic unit above the sentence level was Rhetorical Structure Theory (RST) of Bill Mann and Sandra Thompson (1988). The term *rhetorical relation* as well as the following definition of discourse coherence comes forward from that tradition:

> ... For every part of a coherent text, there is some function, some plausible reason for its presence, evident to readers, and furthermore, there is no sense that some parts are somehow missing. (Mann, RST website, http://www.sfu.ca/rst/)

Somewhat reformulating Mann's subsequent remarks about RST, one could say that rhetorical relations capture the first aspect of discourse coherence—an evident role for every part. In other words, a rhetorical relation is a pragmatic function that one utterance (or larger stretch of text) fulfils with respect to another. It is not uncommon to think of them as *relational speech acts* (Asher and Lascarides, 2003). Like speech acts in a more traditional sense (cf. e.g. Sadock, 2006; Levinson, 1997), such as *statement, request, promise*, etc., rhetorical relations express what a sentence *does*, i.e. what it effects in communication. However, RRs do so by expressing what a sentence does *to another sentence*.

In early work on the topic, RRs have been introduced under a great variety of names, but only three of them have stood the test of time: Mann and Thompson's *rhetorical relations*, Hobbs' *coherence relations*, and the somewhat faceless *discourse relations*. The latter term seems to first have been used in its modern sense by Searle (1975, p. 352), but it has been frequently reintroduced without reference to earlier sources. The reader will have to get used to the fact that almost any notion related to RRs has more than one expression for it. A standard terminology has never settled in.

The main goal of this chapter is to give an introduction to the subject area of rhetorical relations by reconsidering a fundamental and (as many other related issues) yet unsettled question of how many and which RRs exist and by what criteria we should decide whether to include a certain relation into the list of RRs or not, or whether there is such a definite finite list in the first place (section 2).[2] It seems that the decades of research on the topic have led to the general agreement that, whether one believes in the RRs list or not, it is useful to identify natural classes of rhetorical relations and study their common properties at linguistic, conceptual, cognitive levels and from other relevant perspectives. Relations often manifest themselves in the use of context-sensitive linguistic devices: discourse markers such as *but*, *then*, *because*; anaphoric and deictic expressions like *she*, *that*; intonation; categories of tense, aspect, and modality. As long as two (groups of) relations behave differently with respect to these context-sensitive devices, the distinction between those (groups of) relations is justified. This further raises the question which pragmatic or cognitive processes lie behind the distinction so identified. In this chapter we will concentrate especially on the distinction between coordinating and subordinating RRs (section 3). It is interesting because its conceptual/pragmatic nature is still poorly undersood, while its linguistic manifestations in the domain of discourse markers and anaphora are well established and fairly uncontroversial.

2 How many and which?

The example in the previous section contains instances of five rhetorical relations: *Explanation*, *Narration*, *Contrast*, *Result* and *Parallel*. What other relations do we find in texts? Is it possible to give an exhaustive list of RRs? Different approaches to RRs give different answers to these

[2]For a more general introduction to discourse structure see e.g. Kehler (2004) and Zeevat (2011).

questions. However, if we abstract away from details, all those approaches have a certain common core and there are a number of RRs that are recognised by all of them. In this section, we will first try to give such a "consensus list" of rhetorical relations (section 2.1). Then we will turn to the more theoretical question of general criteria for inclusion of a RR into any such list (section 2.2).

2.1 A consensus list of rhetorical relations

Elaboration holds between two discourse units where the second describes the same state of affairs as the first one (in different words), or, at a certain level of abstraction, says the same thing (e.g. Hobbs, 1979, 1985; Kehler, 2002). Usually, an additional requirement is imposed that the second description be more detailed and longer (e.g. Mann and Thompson, 1988), as in (2): (2-b) is an *Elaboration* of (2-a).

(2) a. I did two things on my seventy-fifth birthday. John Scalzi, *Old Man's War*
b. I visited my wife's grave. Then I joined the army.

However, on its broadest definition *Elaboration* also includes as special cases such RR as *Reformulation* or *Restatement* (3), and *Summary* (4), cf. Mann and Thompson (1988), *Specification* and *Generalisation* (Danlos, 1999), as well as self-repair and plain repetition (Hobbs, 1979).

(3) a. A well-groomed car reflects its owner. Mann and Thompson (1988, p. 277)
b. The car you drive says a lot about you.

(4) a. Adrenalin makes the heart pump blood faster; adapted from
dilates the airways of our lungs; *Your body clock*, BNC
and causes a great increase in the release of energy.
b. In sum, it enables the body to be most efficient physically.

Explanation gives the cause or reason *why* the state of affairs presented in the context sentence takes place (5-a), or *why* the speaker believes the content of that sentence (5-b), or *why* the speaker chose to utter it (5-c), which correspond to the three types of causal relations identified by Sweetser (1990): content level causality (5-a), epistemic causality (5-b) and speech act causality (5-c). A typical *Explanation* connective is *because*, but the relation can also be conveyed implicitly, without any connective (6).

(5) a. John came back because he loved her. Sweetser (1990, p. 77)
b. John loved her, because he came back.
c. What are you doing tonight, because there's a good movie on.

(6) Max fell; he slipped on a banana peel. Bar-Lev and Palacas (1980, p. 139)

This broad notion of *Explanation* is common in the Hobbsian tradition (Hobbs 1985; Kehler 2002; cf. also the *Consequence-cause* relation in Sanders et al. 1992). Segmented Discourse Representation Theory (SDRT, Asher and Lascarides, 2003) has three RRs for the three causal relations in (5): *Explanation* in (5-a), *Evidence* in (5-b), and *Explanation** in (5-c). There is no direct counterpart of *Explanation* in Rhetorical Structure Theory (Mann and Thompson, 1988). Among content-level causal relations, RST distinguishes between *Volitional* and *Non-Volitional Cause*. Apart from that, RST gives a fine-grained classification of various ways to give support to your beliefs and speech acts. *Evidence*, *Justify*, *Motivation*, *Enablement*, *Evaluation*, *Background* all overlap in their function with *Explanation*, but vary in goals and

means of giving reasons. For example, *Evidence* is given in order to increase the hearer's belief in a claim, as in (5-b).

Parallel holds between two or more discourse units in virtue of the similarity or uniformity of their content along some relevant dimension (Hobbs, 1985; Kehler, 2002; Asher and Lascarides, 2003). Typical markers of *Parallel* are *also* and *too*. In (7), the similarity condition is satisfied by the predication of the same property *drive a Toyota* of Mary and John. A very explicit way of marking a *Parallel* relation is exemplified in (1-f): *Reminds me of...*, cf. Figure 1.

(7) Mary drives a Toyota. John does, too. Goddard (1986, p. 636)

Plain enumerations like (8) are further instances of *Parallel*. They do not focus on the similarities, but similarity is a precondition for a felicitous enumeration. In (8), similarity is satisfied by the common denominator *someone hid somewhere*.

(8) Mary hid in the cupboard, John hid under the table, and Sue hid behind the couch.

Contrast connects discourse units whose content is "opposite" or "contradictory" in some respect, and is typically marked by the connective *but*. On its broadest definition (as e.g. in Asher and Lascarides, 2003) *Contrast* subsumes all the cases in (9)–(12). In (9), John and Bill have opposite properties *tall* vs. *short* (semantic opposition). In (10), the first conjunct of *but* can be understood as an argument for buying the ring, while the second conjunct is an argument against buying it (argumentative contrast). In (11) the proposition *John is tall* triggers an expectation that John should be good at basketball, since tall players are normally good at basketball, but this expectation is denied by the second conjunct of *but* (denial of expectation). Finally, in (12) the second event "prevents" the execution of a plan, or scenario, related to the first event (preventive contrast). This is also the type of contrast we find in (1-d).

(9) John is tall, but Bill is short. Lakoff (1971, p. 133)

(10) This ring is beautiful, but expensive.

(11) John is tall, but he's no good at basketball. Lakoff (1971, p. 133)

(12) He started to run, but fell. Malchukov (2004, p. 180)

Some theories make a distinction between a narrower notion of *Contrast* that applies primarily to cases of semantic opposition (9) and a RR *Violated Expectation* (Hobbs, 1985; Sanders et al., 1992; Kehler, 2002), most prototypically represented by (11).[3] The crucial difference is that the second, like *Explanation*, involves some sort of causality. In (11), for instance, *John is tall* causes one to believe that John should be good at basketball.

Narration in SDRT, *Occasion* in Kehler (2002), and *Sequence* in RST belong to a group of RRs that connect descriptions of events that (are to) take place one after the other, the order of events matching the textual order of utterances. This is typical for narrative texts and successive instructions, e.g. cooking recipes. Often an additional requirement is imposed that the described events be temporally and spatially contiguous: Where things are at the end of e_1 is where things are at the start of e_2, there is no break in between (Hobbs, 1985; Asher and Lascarides, 2003). So for instance in (13), Max is in the same place at the end of the falling, as he is at the beginning of

[3] Mann and Thompson's RST has at least three relations which are roughly covered by the present broad notion: *Contrast*, *Antithesis* and *Concession*.

John picking him up. For Altshuler and Melkonian (2014, p. 138), this requirement constitutes the difference between *Narration* and *Occasion*. Only the latter requires contiguity, whereas *Narration* describes other kinds of chronological event reports in narrative discourse.

(13) Max fell. John helped him up. Asher and Lascarides (2003, p. 162)

Result or *Cause-Effect* is sometimes regarded as causal strengthening of *Narration* (Hobbs, 1985, p. 11). In (14), the second event does not only follow the first in time, but is also caused by it.

(14) Max fell, and he broke his leg. Bar-Lev and Palacas (1980, p. 140)

On the other hand, *Result* is also often viewed as a dual of *Explanation*. While in *Explanation* the cause follows the effect, in *Result* the effect follows the cause. In this sense, *Result* can also be content-level (15-a), epistemic (15-b) or speech-act-based (15-c), which parallel the corresponding instances of *Explanation* (5-a)–(5-c).

(15) a. The sun was shining. So the temperature rose. Sanders et al. (2009, p. 19)
b. The neighbours' lights are out. So they are not at home.
c. There is coffee and tea. So, what do you want to drink?

The above list of RRs is the distillate of several decades of research on the topic. Obviously, these relations are tailored for the analysis of monologue. More recently, one has started to apply the same idea to dialogue, which led to the addition of a number of RRs specific for discourse with interchanging speakers. We do not deal with dialogue RRs in this chapter but refer the interested reader to the available literature (Daradoumis, 1996; Taboada, 2004; Asher and Lascarides, 2003; Lascarides and Asher, 2009).

2.2 Criteria for inclusion

The list of RRs presented in the previous section is a matter of relative consensus. But why these relations? Is there a definite finite list of RRs and what are the criteria for inclusion of a particular relation in that list?

2.2.1 Descriptive adequacy

One of the earliest answers to this question given by the developers of RST (Mann and Thompson, 1988) was motivated by the goal to capture the full variety of structures of natural texts. They proposed a list of over twenty RRs, but stated explicitly that the list is potentially open and further relations can be added if required for an adequate description of particular texts. However, descriptive adequacy as the sole principle for defining a set of RRs has been the object of a lot of criticism. Knott and Dale (1994) point out two problems with that view.

The first problem is that the central claim of RST that text is coherent in virtue of the relations between its parts becomes unfalsifiable if one can add RRs at will. For instance, what would stop one from adding relations that describe incoherent texts? To adequately describe (16) one could, for example, introduce a relation *inform-accident-and-mention-fruit* (Knott and Dale, 1994, p. 40).

(16) John broke his leg. I like plums. Knott and Dale (1994, p. 39)

Clearly, we do not want to include such arbitrary relations in any principled set of RRs. Therefore there must be more contentful contstraints on what counts as a good relation.

The second problem is that if we go by descriptive adequacy alone, the space of possible textual relations can be subdivided into specific RRs in very many different ways most of which are useless. Useful sets of RRs, like any useful theoretical concepts, are designed to model *real phenomena*. Therefore, selection of a set of RRs out of a range of theoretical possibilities should be guided by the question of which linguistic phenomena it is supposed to model.

2.2.2 Cognitive adequacy

On both issues substantial progress has been made since Mann and Thompson's original proposal. One of the strongest answers to the first issue has been given by Kehler (2002). Developing Hobbs' idea that coherence relations reflect cognitive principles that we apply when we try to make sense of the real world, Kehler proposes that there are three such principles corresponding to the three principles of connection between ideas suggested by David Hume in his *Inquiry Regarding Human Understanding*: resemblance, contiguity in time and space, and causal relations. Accordingly, Kehler identifies three types of coherence relations:

Resemblance relations hold in virtue of recognisable similarities and differences between the corresponding elements (entities, relations) of the content of two sentences (or larger discourse units). Among the consensus RR in section 2.1, *Elaboration*, *Parallel* and the 'semantic opposition' type of *Contrast* (9) belong to this class. For example, we establish a *Contrast* relation in (9) because we are able to recognise that both clauses talk about the height of individuals John and Bill (the similarities), and state that the height is *not* the same (the differences).

Cause-effect relations depend on the possibility to establish an inferential link between the contents of two discourse units. In section 2.1, this type is instantiated by *Result*, *Explanation*, and the denial of expectation type of *Contrast*. The "inferential link" is understood in a broad sense, ranging from causal relations between the events described as in (5-a) to defeasible consequence relations as that between an expectation trigger in the first conjunct of *but* and the expectation denied by the second conjunct of *but* in (11).

Contiguity relations are based on knowledge gained from human experience about how eventualities can enable, or set the stage for, other eventualities in the world. This class contains one relation—*Occasion* (cf. *Narration* in section 2.1).

Crucially, the claim is that a sequence of discourse units is coherent *only if* the relationship between the units can be established by one of these three principles. A relation can be included in "the list of RRs" *only if* it can be shown to satisfy the conditions for one of these three types. This keeps arbitrary relations like *inform-accident-and-mention-fruit* out and lays the foundations of a falsifiable theory of discourse coherence.

2.2.3 Phenomena modelled by RRs

The second issue is which linguistic phenomena RRs are supposed to model and how that determines which RRs should be distinguished. The relevant phenomena include anaphora, presupposition, ellipsis, tense and aspect, resolution of lexical ambiguity, the functioning of connectives, discourse particles and intonation. Going a bit beyond the realm of pure linguistics, one might also include the contribution of pragmatic inferences (e.g. conversational implicatures) to the interpretation of sentences and coherent discourse. Approaches differ as to which (aspects)

of these phenomena are considered essential for motivating distinctions between RR. For instance, SDRT considers these phenomena to the extent that they influence the truth-conditional interpretation, represented by the logical form of discourse (Asher and Lascarides, 2003, p. 145). As a consequence, the content conveyed by such a logical form is more restricted compared to the notion of meaning pursued by Hobbs and followers, and the taxonomy of RRs is less fine-grained compared to descriptive approaches such as RST (ibid.). Thus, while SDRT entertains just one *Contrast* relation, RST distinguishes between *Contrast*, *Antithesis*, and *Concession* that differ in terms of the underlying communicative intentions but not in terms of the temporal relation between the described events or the question of whether the arguments of the RRs are true (ibid.). This view on discourse structure is rooted in work on *Discourse syntax* and *Discourse grammar* (Polanyi and Scha, 1983; Polanyi, 1988; Prüst et al., 1994; Longacre, 1983) and constrains the set of possible RRs to those which influence the truth-conditional semantics of the elements related. A completely different approach is to make the granularity of the classification dependent on the distinctions that can be made by the system of discourse markers in a particular language or in languages of the world, as, for instance, in the work of Knott and Dale (1994) and Hovy and Maier (1995).

In this paper we concentrate on two major classes of phenomena: (a) discourse markers, cue phrases, or connectives, such as *but, then, therefore, for instance, because, otherwise, that is*, etc.; and (b) anaphoric devices in a broad sense, i.e. linguistic devices that are dependent in their interpretation on previous context. These include anaphoric pronouns (*she, that*), ellipsis, various presupposition triggers, anaphoric tenses, etc.

Discourse markers: Suppose like Hovy and Maier (1995) we are building a text generation system that should be able to appropriately use English discourse markers. Such a system must know which semantic relations to express, which means that its inventory of RRs should be at least as rich as the vocabulary of discourse markers it is supposed to generate. Hovy and colleagues' classification of English discourse markers leads them to postulate over 170 RRs—one of the biggest sets of RRs proposed to date.

Discourse markers have been used to motivate sets of RRs also by Knott and Dale (1994), Knott (1996), and Knott and Sanders (1998). In particular, these authors propose a set of abstract features, e.g. causal vs. non-causal relations, relations with basic vs. non-basic order of segments, positive vs. negative relations, etc. RRs are defined by different combinations of values of those features. For example, the RR *Explanation* is defined as a causal relation with a non-basic order of segments. In an *Explanation* relation, 'non-basic order' means that the cause is presented after the effect, which is opposite to the natural temporal order of causes and consequences. *Violated Explectation* (or 'denial of expectation' type of *Contrast*) is a typical instance of a negative causal relation: the (broadly) causal link holds not between the contents of the segments as such, but between the content of one segment and the negation of the other, as in (11). Discourse markers, in turn, are used to motivate the features. A feature is justified if there is a discourse marker that encodes it, possibly in combination with other features. For example, the English *but* marks negative relations, whereas the English *because* can be considered a marker of positive causal relations.

The question that arises as soon as we use discourse markers to motivate a set of RRs is: Since languages differ in their vocabulary of discourse markers, does it mean that they have different sets of RRs? For example, the distinction between *Parallel* and *Contrast* is typically tied to the distinction between the English *and* and *too* on the one hand, and *but* on the other. However, Russian makes a three-way distinction between *i* $\approx$ *and*, *no* $\approx$ *but*, and *a*, which has some of the uses of *and* and some of *but* (Jasinskaja and Zeevat, 2008). Moreover, the

three connectives are in a more or less complimentary distribution. For example, both (17) and (18) use *and*, and would normally be categorised as instances of *Parallel*. However, in Russian (17) could only be expressed with *i*, and (18) could only be expressed with *a*. The semantic difference between the two cases is prominent for Russian speakers and its encoding is obligatory. Does it mean that Russian has two different *Parallel* relations where English has only one?

(17) Idet sneg *i / #a* duet veter.
go snow and blow wind
'It is snowing and the wind is blowing.'

(18) V Moskve idet sneg *#i / a* v Amsterdame duet veter.
in Moscow go snow and in Amsterdam blow wind
'It's snowing in Moscow and it's windy in Amsterdam.'

Even looking at two very closely related languages English and Dutch, Knott and Sanders (1998) observe that the languages give rise to different taxonomies. And what if we take into account a truly representative sample of the languages of the world?

Semantic typology has a ready answer to this question, which, however, has rarely been brought to bear on theories of RRs. Even if Knott, Sanders, and colleagues do not call it that way, the data driven taxonomy of RRs they develop can be easily converted into a *semantic map* of the space of coherence relations. A semantic map is a graph whose nodes represent various possible functions, or meanings, or uses of linguistic expressions, and whose arcs reflect the relation of semantic "closeness" or "relatedness" between those functions (Haspelmath, 2003). The semantic map in Figure 2, developed by Malchukov (2004), represents the space of conceptual relations expressed by adversative and contrast markers. These conceptual relations can be interpreted in terms of RRs. The *concessive* and the *adversative* functions correspond to our 'denial of expectation' and 'argumentative' *Contrast*, respectively; Malchukov's *contrast* conflates (as argued by Jasinskaja, 2010a) the 'semantic opposition' type of *Contrast* and the variety of *Parallel* exemplified in (18); *additive* is roughly *Parallel* as in (17) and (7); *consecutive* is essentially *Narration*. The map also includes some other functions motivated by Malchukov's language sample. For instance, *mirative* is a kind of *Narration* where the second event is surprising against the background of the first. This relation never came into view as long as we were looking at English, but there are languages that express it systematically. The grey areas in Figure 2 show how these functions are divided between the English connectives *and* and *but*. In contrast, Figure 3 shows how the same space is split up between *i*, *a* and *no* in Russian.

Crucially, the functions are arranged on the map and interconnected in such a way that the more closely connected functions are "semantically more similar" and are cross-linguistically more likely to be expressed by the same marker. The standard assumption is that a marker must cover a contiguous subgraph of the semantic map. This means that, for instance, a comitative marker cannot suddenly start to be used as an adversative without first (or simultaneously) acquiring either the additive and the contrastive function, or the consecutive and the mirative function. The inventory of functions and the structure of the semantic space, as reflected by the map, are assumed to be universal. Languages differ in the way they carve up that space.

The bottom line of this is: If we are in search of a universal set of RRs motivated by the systems of discourse markers of the world's languages, shouldn't we be constructing a semantic map of the space of RRs using the standard methods of semantic typology? The resulting set of functions would give us the set of RRs. The connections between functions can then be

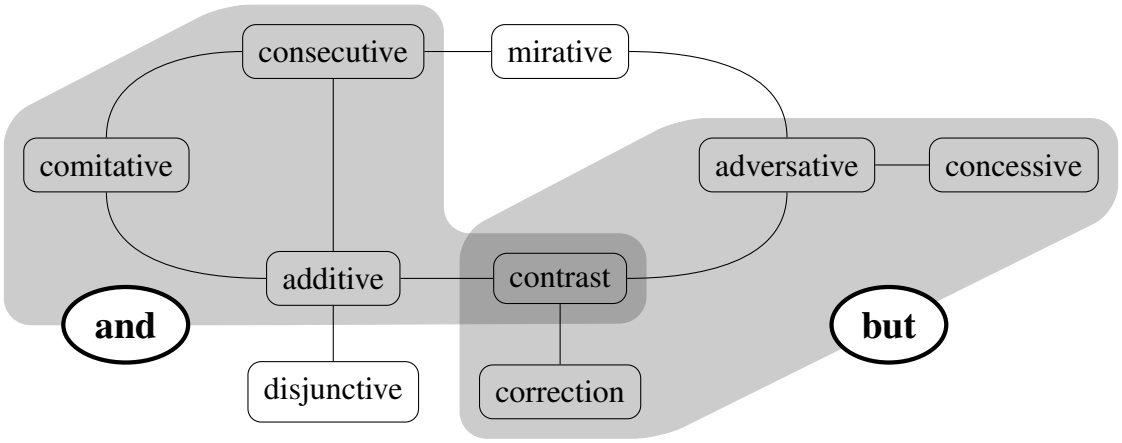

Figure 2: English *and* and *but* on Malchukov's (2004) semantic map

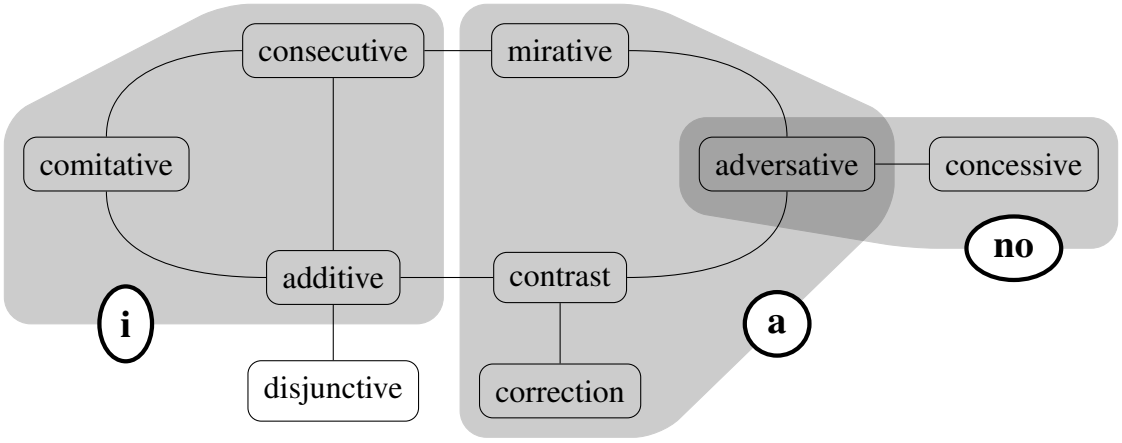

Figure 3: Russian *i*, *a* and *no* on Malchukov's (2004) semantic map

interpreted in terms of semantic features *à la* Sanders et al. (1992). However, they would also give us more than those abstract features do. When two RRs are connected by an arc in a semantic map, this means that at least in some languages they can be expressed by the same marker, which in turn means that a more general RR or an RR category, covering those two relations, is also motivated. From a historical point of view, this means that a discourse marker can change its meaning from RR_1 to RR_2, or generalise from one of the relations to the overarching category. It is conceivable that the space of RRs will actually never give rise to a single contiguous map because some (groups of) RRs never share the same markers. This would mean that whatever abstract categories we come up with that generalize over those groups of RRs would remain unmotivated from the point of view of discourse markers' semantics. In section 3 we will use this reasoning in our discussion of the category of subordinating RRs. To conclude for now, semantic maps seem to offer a useful method in our search of a set of RRs motivated by a set of discourse markers or cue phrases. However, the study of discourse markers and RRs from a typological point of view is still in its beginnings. The results of existing comparative and typological studies (for a start see Kortmann, 1997; Malchukov, 2004; Lewis, 2005; Mauri, 2008; Jasinskaja, 2010a) still need to be consumed by the more theoretically oriented approaches.

Anaphora: Another set of phenomena that requires a differentiated set of RRs is related to the interpretation of anaphoric devices. We will concentrate here on anaphoric pronouns like *she* or *that*. The resolution possibilities for pronouns depend on the RR between the sentence containing the pronoun and the sentence containing the potential antecedent (Hobbs, 1979; Kehler, 2002). The set of RRs required to correctly describe the resolution preferences might not be as fine-grained as the one needed to describe the semantics of discourse markers, but as argued by Kehler (2002) at least the distinctions between the major classes *Resemblance*, *Cause-effect* and *Contiguity* are needed.

Resemblance relations show a strong preference for pronoun resolution to an antecedent in a parallel structural position or semantic role, e.g. subject to subject, direct object to direct object, etc. (see Kameyama, 1986). For instance, in (19) the pronoun *her* is interpreted as referring to Hillary Clinton despite the fact that both Bush and Thatcher are conservative and it is therefore more likely that Bush would worship Thatcher. Nevertheless, *her* is interpreted as referring to Clinton because we are trying to relate these sentences by a *Parallel* relation and the resolution to Clinton gives us a better *Parallel*.[4] Kehler suggests that this preference is so strong that even though in (20) Thatcher is the only female referent in the context, speakers tend to correct for the pronoun's gender and interpret it as referring to Reagan.

(19) Margaret Thatcher admires Hillary Clinton, and George W. Bush absolutely worships her. — Kehler (2002, p. 7)

(20) Margaret Thatcher admires Ronald Reagan, and George W. Bush absolutely worships her. — Kehler (2002, p. 159)

The interpretation of the pronoun *him* in (21) depends on whether a Resemblance relation (*Parallel*) or a Cause-effect relation (*Result*) is established between the clauses. In the first case, the parallel role preference is operative and the object pronoun refers to the object antecedent Dick Cheney. On the *Result* reading, pronoun resolution is determined by world knowledge and general assumptions on what counts as a plausible causal relation. Since defying is a more likely cause for punishment than being defied, the preferred resolution of the pronoun is to Colin Powell.

(21) Colin Powell defied Dick Cheney, and George W. Bush punished him. — Kehler (2002, p. 166)

Finally, Contiguity relations make us interpret the final state of one eventuality as the initial state of the next. Therefore, "the referent most attended to should be the one that is most prominent with respect to the hearer's conceptualization of the end state of the previous eventuality" (Kehler, 2004, p. 259). One of the ways how this mode of interpretation can affect pronoun resolution is illustrated in (22). In transfer posession events like seizing and passing, focus on the final state leads to focus on the receiving party: John in (22-a) and Bill in (22-b). Empirical studies show that this is reflected by resolution preferences of subsequent pronoun *he* (Stevenson et al., 1994).

(22) a. John seized the comic from Bill. He... — Kehler (2002, p. 168)
b. John passed the comic to Bill. He...

In other words, in order to describe the pronoun resolution preferences in these examples the

[4]This example also shows that the parallel role preference in Resemblance relations overrides the general preference for anaphoric pronouns to refer to the subject of the preceding sentence, considered as one of the most important factors in the bulk of previous work (see e.g. Brennan et al., 1987).

set of RRs must distinguish at least between the three major classes proposed by Kehler (2002), see section 2.2.2.

To summarize this section, different phenomena may lead us to adopt different taxonomies of RRs: rather more fine-grained ones to describe the semantics and distribution of discourse markers, and more abstract ones for the analysis of other phenomena, e.g. anaphoric pronouns. Both kinds of taxonomies are equally motivated as long as they are supported by real phenomena. To some extent they even may converge. The success story of discourse semantics are Resemblance relations in this respect. Resemblance relations depend on finding parallel parts between two utterances and are based on similarities and differences between the contents of those parts. Pronoun resolution preferences depend on finding the parallel parts as well, cf. (19). And the semantics of typical markers for resemblance relations (*and*, *but*) has been characterized in terms of constraints on those parallel parts (Lang, 1991; Jasinskaja and Zeevat, 2008). There is hope that we will find the same principles governing anaphora resolution and reflected in the semantics of discourse markers for other kinds of RRs as well. That would be the strongest evidence for a specific taxonomy of RRs.

3 Discourse-structural subordination

Finally, in this section we will look at the distinction between coordinating and subordinating rhetorical relations (cf. multinuclear vs. nucleus-satellite relations in RST), with particular focus on subordination. In the consensus list of RRs presented in section 2.1, *Elaboration* and *Explanation* are typically regarded as subordinating relations, whereas *Parallel*, *Contrast*, *Narration* and *Result* standardly count as coordinating (Asher and Lascarides, 2003).

The first question is whether the class of subordinating RRs is well motivated according to the criteria discussed in the previous section, or whether it is relevant for the description of real linguistic phenomena. The answer to this question is a clear 'yes' and the following subsections 3.1 and 3.2 illustrate the effect of subordination on anaphoric processes and the use of discourse markers, respectively. The second question is: What does it mean for an RR to be subordinating? Can this term be given a general definition such that both the inclusion of specific rhetorical relations in this class and the distinctive characteristics of their linguistic behaviour would follow from that definition in the same way as, for instance, the behaviour of Resemblance relations with respect to anaphora follows from the definition of Resemblance? This question has proved much more difficult so far. In their influential paper devoted entirely to this issue, Asher and Vieu (2005) ultimately give up on the plan of giving such a general definition and end up characterising the coodination/subordination distinction exclusively in terms of its linguistic effects. As will become clear in this section, the evidence from the marking patterns of subordinating relations and the evidence from their effect on anaphora resolution, indeed, do not converge on a single theoretical account of subordination. This situation is unsatisfactory: We know that the notion of discourse-structural subordination is useful and how it is useful, but we still do not know what subordination is and why it has the effects it has. Section 3.3 sketches out an approach that relates the notion of subordination to discourse structure characterized in terms of communicative goals and provides a tentative explanation to the relationship between the semantics of specific subordinating relations *Elaboration* and *Explanation* and their linguistic behaviour.

3.1 Subordination and anaphora

The influence of discourse-structural subordination on anaphoric reference is captured by what came to be known as the *Right Frontier Constraint* (Polanyi, 1988; Webber, 1991). The "right frontier" metaphor is based on the assumption that we construct the discourse structure graph from left to right as we process a discourse incrementally sentence by sentence, depicting coordinating RRs by horizontal lines and subordinating RRs by vertical ones, as we did in Figure 1 for the Trump example. In this way, the last processed sentence is always in the rightmost position. The right frontier of a discourse graph is a set of all its rightmost nodes at all levels along the vertical dimension. More precisely, the right frontier consists of the last processed node and all the nodes to which it is connected by a subordinating relation. The basic generalization is:

(23) *Right Frontier Constraint:* Only the nodes at the right frontier of the discourse graph are accessible for attachment of new discourse material.

The Right Frontier Constraint can be seen as a structural reformulation of a generalisation formulated earlier by Grosz and Sidner (1986) in more procedural terms: The processing of discourse requires keeping track of a *stack of focus spaces*. Focus spaces correspond to utterances or bigger discourse units and contain semantic entities (e.g. referents) and communicative goals of those discourse units. In a certain class of cases which correspond to our subordinating RRs, the focus space of the subordinate unit is pushed on the stack while the focus space of the subordinating unit also stays there while the subordinate unit is processed. Once the processing of the subordinate unit is complete, its focus space is popped off the stack so the focus space of the subordinating unit becomes topmost again and available for various operations such as anaphoric reference. In the case of coordination, the focus spaces are processed on the "first come, first served" basis, i.e. previously processed units are not kept in memory, so there is no way to go back and access the entities associated with those units.

For illustration consider example (1) again, repeated below. (1-f) is the last processed sentence and is therefore on the right frontier. So is the complex node (1-b)-(1-f), as well as the node that we can reach from it by moving vertically over subordinating RRs—(1-a), cf. Figure 1. In contrast, the nodes (1-b) to (1-e) are not on the right frontier because reaching them from (1-f) would require moving horizontally over coordinating RRs.

(1) a. I've got some sympathy for Trump.
b. He went for a job,
c. tried to throw the interview
d. but accidentally got it
e. and now he hates it.
f. Reminds me of every interview I had for jobs I didn't want when I was on benefits.

This means that the next sentence could be, for instance, an *Elaboration* of (1-f), as in (24-c). In this case, the demonstrative pronoun *this* refers to the event type of the speaker being interviewed for and getting an unwanted job. (24-b) would be a perfect continuation after (1-e), the pronoun *this* referring to Trump's disappointment at the results of his campaign. However, (24-b) is strongly infelicitous after (1-f). It has the unlikely interpertation that Trump is tweeting about Leo Kearse. This is because at that point in discourse (1-e) is not on the right frontier any more and is blocked for discourse attachment and anaphoric reference by the more recent (1-f). Crucially, (24-a) is not as bad after (1-f) as (24-b) even though it refers to an even less recent antecedent: *this* = 'my sympathy for Trump'. This is because (1-a) is on the right frontier and is accessible, since it subordinates (1-f).

(24) a. ?This disturbs my left wing friends. *Result* of (1-a)
b. #This has been the subject of his recent tweets. *Evidence* of (1-e)
c. This happened to me last month. *Elaboration* of (1-f)

Anaphoric reference follows largely the same principles as discourse attachment: In searching for an antecedent for an anaphoric expression, we are allowed to "look left one step only or look up" (Asher and Vieu, 2005). For example, the 1st and the 2nd sentence in (25) are connected by a coordinating relation *Parallel*. Therefore only the 2nd sentence is on the right frontier and the pronoun *he* in the following sentence is preferably resolved to a referent mentioned in the 2nd sentence, i.e. Bill. In contrast, in (26) the second sentence provides evidence for the 1st by reference to an authoritative source. *Evidence* is a subtype of *Explanation*, i.e. a subordinating relation. Both sentences in (26) are therefore on the right frontier, so the following sentence could continue giving the evidence, in which case the pronoun *he* could refer either to Bill or to John; or it could continue telling the story about John, in which case *he* would refer to John.

(25) John broke the vase. Bill broke the mirror. He_{Bill} ... *Parallel*

(26) John broke the vase. Bill told me that. $\text{He}_{John/Bill}$ ... *Explanation (Evidence)*

These observations show that the distinction between coordinating and subordinating RRs is indeed necessary for a proper account of anaphora in discourse. The Right Fronier Constraint captures the interplay between hierarchical structure and recency with respect to anaphoric accessibility. Normally, only the last, i.e. the most recently processed sentence constitutes the context for discourse attachment and anaphora resolution. However, subordination is in a way special, because it allows us to skip the subordinate material, look over its head and attach to less recent but hierarchically higher situated context. What remains a mystery, however, is why e.g. *Elaboration* and *Explanation* have this special property, while *Parallel*, *Contrast*, *Narration* do not.

3.2 Marking patterns of *Elaboration* and *Explanation*

What can discourse markers tell us about the nature of discourse-structural subordination? Are the semantic spaces of *Elaboration* and *Explanation* interlinked or entirely dissociated in the sense of the semantic maps approach skethced out in section 2.2.3? Is there a discourse marker that expresses discourse-structural subordination 'in general'? While the first question can be answered in the positive, as shown by the case of German discourse marker *nämlich*, the second probably not. Below we discuss the conjunction *and* which is sometimes viewed as a general marker of discourse structural coordination (esp. Txurruka, 2003), and so the absence of *and*, under certain conditions, could be considered a candidate for a general cue to subordiantion. However, we argue that this only allows us to characterize the common core of *Elaboration* and *Explanation* in pragmatic, but not in semantic terms.

Nämlich: At first glace, the patterns of expression of *Elaboration* and *Explanation* are quite different. The connective *because* can be considered a general marker of *Explanation*. It seems to express causality and nothing else (cf. example (5) in section 2.1), and causality is generally believed to consitute the semantic core of *Explanation*.

In contrast, there seems to exist nothing like a generalized marker of *Elaboration* which just encodes, for instance, the relation of "sameness of situations/events" and nothing else. Elaboration markers are extremely varied, encoding a large number of very specific kinds of elaboration: *that is*, *in other words* (reformulation), *for example*, *especially* (exemplification),

in particular, *more specifically* (specification), *in sum* (generalization), see e.g. Del Saz Rubio (2008) for a comprehensive classification. For some varieties of *Elaboration* it is even hard to think of any appropriate discourse marker. This is especially the case with so-called *process-step* elaborations where one sentence presents a general description of a sequence of events followed by a sequence of sentences discribing each event in particular, e.g. (2). Such elaborations, it seems, go best without any marker. Of course, the search for a generalized marker of *Elaboration* across the world's languages should not stop. However, so far we have not found a linguistic expression that lexicalizes "*Elaboration*-semantics" in general. That is, there is no evidence based on discourse markers' semantics for the semantic unity of *Elaboration*.

But if there is no unity even within *Elaboration*, does it make sense to look for a unified semantics for *Elaboration* and *Explanation*? Interestingly, we do find discourse markers that span across the two groups of RRs. The case in point is German *nämlich*, lit. 'namely' (Breindl, 2008; Onea and Volodina, 2011; Karagjosova, 2011a,b), as well as its cognates Dutch *namelijk* and Norwegian *nemlig*.

On the one hand, *nämlich* can express the relation of *Specification* (a subtype of *Elaboration*), between two phrases, cf. (27), or between two clauses, cf. (28):

(27) Behalten möchte auch Michael Douglas (65) etwas - *nämlich* sein Geld. Jasinskaja and Karagjosova (2011, p. 8)
'Even Michael Douglas (65) wants to keep something - namely his money.'

(28) und da hat die Gruyten was ganz Großartiges geschrieben: sie hat nämlich eine flammende Verteidigung des Grafen F. geschrieben Karagjosova (2011a, p. 38)
'and the Gruyten girl wrote something really splendid: what she wrote was an ardent defense of Count F.'

On the other hand, *nämlich* can express various kinds of *Explanation*:

(29) Der Dieb konnte nicht fliehen. Der Inspektor *nämlich* war schneller. Karagjosova (2011a, p. 35)
'The thief couldn't get away. The inspector was faster.'

In fact, some uses of *nämlich* seem underspecified between *Specification-Elaboration* and *Explanation*:

(30) Peter hat ein Problem. Die Arbeiter wollen nämlich Geld. Karagjosova (2011b, p. 3)
'Peter has a problem. The workers want NAMELY money.'

Based on those and similar examples, Karagjosova (2011a,b) argues that the basic function of *nämlich* is specificational, while the explanation uses should be seen as the result of weakening from a full-fledged specification marker, to a marker of more abstract logical and inferential relations that typically accompany specification.

However, within the broader class of *Elaboration* RRs, *nämlich* is restricted to *Specification*, and cannot be used, for instance, to express a *Summary* RR or a process-step *Elaboration*. So it is inappropriate in the German version of (4), whereas in (31) it can only be interpreted as an *Explanation* marker: the speaker has seen Peter make dough, put it on a baking sheet, etc., and presents that in evidence of the conjecture that Peter was baking a cake.

(31) Peter backte einen Kuchen. Er machte (nämlich) Teig, legte ihn auf einem Blech aus, legte geschnittene Äpfel darauf und schob das ganze in den Ofen.
'Peter was baking a cake. He made some dough, put it on a baking sheet, put apples

cut in pieces on top, and put the whole thing in the oven.'

In other words, in order to represent the functions of *nämlich* on a semantic map, at least some semantic functions from the *Elaboration* space must be connected to at least some semantic functions in the *Explanation* space. That is, the two semantic spaces are not entirely dissociated in terms of semantic map connectivity. However, so far there is no evidence for a single semantic function overarching the whole spaces of *Elaboration* and *Explanation* (i.e. for a unified category of subordinating RRs). At least, the case of the German *nämlich* does not provide such evidence.

(The absence of) *and*: Another way to look for a unified marking pattern of subordinating relations is to look at the marking of coordination first. It has long been noticed that the connective *and* can be used to connect clauses that stand in a *Narration* (32), a *Parallel* (33) or a *Contrast* (34) relation, but that it is incompatible with *Elaboration* and *Explanation* (Carston, 1993; Blakemore and Carston, 1999; Txurruka, 2003, examples from Blakemore and Carston 1999).[5]

So for instance (35-a) is an *Elaboration*: The two sentences describe the same event, and as a consequence the object DPs *a great actress* and *Vanessa Redgrave* describe the same person. If we insert *and* as in (35-b), the interpretation changes to *Parallel* or *Contrast*, the sentences describe two distinct events and Vanessa Redgrave is not the great actress anymore. Similarly, (36-a) is an *Explanation* and the pushing precedes the falling, cf. (13). With *and* inserted (36-b), the interpretation changes to *Narration* and the pushing follows the falling.

(32) She jumped on the horse and rode into the sunset. *Narration*

(33) She did her BA in London and she did her A levels in Leeds. *Parallel*

(34) Paul is a linguist and he can't spell! *Contrast*

(35) a. I met a great actress at the party. I met Vanessa Redgrave.
b. I met a great actress at the party. And I met Vanessa Redgrave.

(36) a. Max fell. John pushed him.
b. Max fell, and John pushed him.

Txurruka (2003) argues that the English connective *and* encodes coordination in the discourse-structural sense, i.e. if *and* connects two clauses then the RR between those clauses can only be coordinating. Jasinskaja (2007, 2010b, 2013) goes even further arguing that coordinating RRs must be marked in one way or another, either by *and*, or by a more specific marker (e.g. *but*), by intonation, or by the presence of a contrastive topic, etc., while only subordinating relations like *Elaboration* and *Explanation* can be absolutely unmarked.[6] Here it is important to distinguish between two kinds of unmarked connection. On the one hand, many additive conjunctions, especially in the languages of Europe, have the property that when they connect more than two conjuncts the marker need not be repeated, but can only appear before the last one (Haspelmath, 2007), as in (37):

[5]There is a famous class of counterexamples originally attributed to Larry Horn and discussed by Blakemore and Carston (1999), Txurruka (2003) and Zeevat and Jasinskaja (2007), in which a backwards causal relation ($\approx$ *Explanation*) seems to hold between the conjuncts of *and*. We do not discuss this case here, but refer the interested reader to the literature.

[6]As a reviewer pointed out to us, this marking pattern is naturally explained in RST in terms of its distinction between nucleus and satellite: only nuclei need to be marked, since they represent the main segments.

(37) a. John came into the room,
b. he poured himself a cup of coffee,
c. *and* took his place in front of the TV.

Adding *and* before (37-b) would not change the fact that all three conjuncts are understood to be connected by *Narration*. This is in contrast with (35) and (36), where adding *and* changes the interpretation dramatically. So we say that in (37-b) *and* is implicitly present, whereas in (35-a) and (36-a) it is really not there.

Although it seems that *and* could also be removed from (37) without affecting the discourse relation, this creates an impression of incompleteness, one is tempted to put '...' at the end of the discourse. There is no such effect in (35) or (36). Moreover, in speech the connection would then have to be marked by intonation (typically rising or high "continuation" tone).[7] In other words, the connection between (37-a) and (37-b) is only "seemingly" unmarked. In contrast, the connection in (35) and (36) is unmarked "properly": no later occurrence of *and* or '...', no comma, or "comma intonation" is required.

So it looks like the possibility of absolute absence of marking is characteristic for subordinating RRs. Could the absence of marking be our unified "marker" of discourse-structural subordination? While it is definitely a cue to subordination, it does not count as a discourse marker in any way useful for our argument. Recall that an RR or an abstract class of RRs is motivated from the point of view of discourse marker semantics if in some language there is a discourse marker that lexicalizes that RR or class of RRs. But it does not make sense to say that the absence of a marker lexicalizes anything. The apparent subordination effect associated with unmarked connection must be explained in terms of general pragmatic processes. One can then wonder how *and*, *but*, and other coordinative connectives mark against those pragmatic defaults. Discourse marker semantics could therefore provide us with a "concept" for coordination but not for subordination.

3.3 Towards a definition of subordination

In this last section we will sketch out an approach to discourse-structural subordination based on the idea, which goes back at least as far as Grosz and Sidner (1986), that each sentence or bigger discourse unit pursues a communicative goal and that discourse structure is defined in terms of relationships between those goals. In what follows, we will explore the consequences of difining subordination in terms of such relationships, as proposed in (38). However, if previous attempts in this direction have been criticized on the grounds that relationships between goals are just as poorly understood as the notion of subordinating RRs (see esp. Asher and Vieu, 2005), we will develop a rather specific view of relevant relationships between goals, which will allow us, on the one hand, to establish a connection between goal-based pragmatics of subordination and the semantic effects of *Elaboration* ("same event" semantics) and *Explanation* (causal semantics), and on the other hand, to explain the effect of subordination on anaphora resolution.

(38) In a sequence of discourse units $\langle U_1, U_2 \rangle$, U_2 is subordinate to U_1 whenever the communicative goal of U_1 cannot be reached before the communicative goal of U_2 is reached.

The notions of communicative goal and reaching a goal will be clarified presently. Right now, note that the defintion in (38) is sensitive to the linear order of discourse units. It only defines subordination in the direction from a later towards an earlier utterance. This has two reasons.

[7] The same holds generally for a wide range of world's languages outside Europe where coordination is expressed entirely by intonation and coordinating conjunctions like *and* are not available (see Haspelmath, 2007).

First, from the point of view of constraints on discourse attachment and anaphora resolution discussed in section 3.1 we are only interested in the case where the subordinate unit follows the subordinating one. Only then can subordination work against recency, making less recent discourse units accessible for attachment and anaphoric reference. If the subordinate unit precedes the subordinating one, subordination and recency work in the same direction and the most recent unit ends up as the most accessible, as it would anyway. For all we can tell, this case is indistinguishable from the case where the two units are discourse-structurally coordinated. Second, it is implicit in the order $\langle U_1, U_2 \rangle$ that the speaker first attempts to reach, or at least starts working towards the goal associated with U_1. However, as the definition says, this goal cannot be reached before that of U_2. In other words, the speaker starts working towards the goal of U_1, but has to interrupt this process, handle U_2, and either in or after doing so reach the original goal of U_1. This idea of interruption is essential to discourse subordination, because it explains why U_1 has to be kept in memory while U_2 is processed. Since the communicative goal of U_1 has not been reached yet, and the communication participants will eventually have to go back to U_1 and reconsider the extent to which its goal has been reached after processing U_2. This is why Grosz and Sidner's stack model is applied to subordination, and this is why subordination works against recency as described by the Polanyi's Right Frontier Constraint.

In line with Grosz and Sidner (1986) and related work (e.g. Roberts, 1996; Farkas and Bruce, 2010) we assume that typical communicative goals of utterances are: (a) to make the addressee believe some proposition, or accept it to a degree sufficient for the purposes of the exchange, i.e. make that proposition part of the common ground (Stalnaker, 2002); (b) make the addressee perform or commit to performing some action; and in particular (c) make the addressee answer a question. Furthermore, following Clark and Schaefer (1989), Clark (1996), Traum (1994), Ginzburg (2012), and other researchers that have emphasized the role of *grounding*, we assume that for a communicative act to reach its goal it is not enough that the addressee believes the intended proposition or commits to the desired action. It must also become obvious to the speaker that the addressee does so. The most unequivocal evidence of grounding is when the addressee immediately performs the requested action, answers the question asked by the speaker, or provides a response that shows his/her belief of the communicated proposition (e.g. by marking that proposition as a presupposition). More ambiguous but widely used signals of grounding are nods, utterances like *mhm* and *yes*.

According to Clark (1996), grounding proceeds in four stages that correspond to four levels of action in communication: (1) vocalisation by the speaker which should result in attention by the hearer; (2) presentation of the acoustic signal, which should result in the hearer's identification of the phonological string; (3) the speaker's meaning which should result in the hearer's understanding; and (4) the speaker's proposal which should result in the hearer's uptake of the proposal. Translating this into our terminology, the ultimate goal of an utterance is grounding at level 4, i.e. the hearer's uptake of the speaker's proposal to believe a proposition, to perform an action, to answer a question, etc. However, on the way to this ultimate goal a few intermediate goals have to be reached corresponding to the lower levels.

Crucially, grounding can fail at any of these levels. When the speaker encounters or anticipates a problem at any stage of grounding U_1, he/she can produce another utterance, U_2, to handle that problem, after which grounding U_1 can be resumed and (hopefully) successfully completed. We propose that the primary function of discourse subordination is to handle (encountered or anticipated) grounding problems at different levels. The trouble can be signalled by the hearer's explicit clarification question (in square brackets in examples (39)–(43) below), or the clarification question can be accommodated as an implicit *question under discussion* (QUD, Ginzburg, 1995a,b; Roberts, 1996; Klein and von Stutterheim, 1987). This idea has

been used by Ginzburg et al. (2007) in their unified analysis of other-initiated and self-initiated speech repair. On that view, self-repair is an answer to an implicit clarification request. By taking into account a larger variety of possible communicative problems and including deeper levels of grounding—going beyond Clark's level 3 (problems of understanding) to include level 4 (disagreement)—we extend this approach to a much broader range of relations in discourse.[8]

Two of the more frequent reasons for understanding failure are problems of reference resolution (39) and lexical access (40). *Reformulation* is a way to repair for this kind of problem.

(39) It's there.
[Where is 'there'? / It's WHERE?]
Behind the refrigerator.

(40) This piece begins with an anacrusis,
[What is 'anacrusis'?]
an unaccented note which is not part of the first full bar.

Part of understanding an utterance is "pragmatic" understanding: seeing how the utterance relates to the previous context, in what way it is relevant, and what its implicit content is. Various problems at this level can be handled by relations of the elaboration group. For example, *Generalisations* and *Summaries* like (4), repeated below, are called for when the hearer is otherwise unable to establish the connection between different parts of a text (cf. "forging links" by generalisations in Danlos and Gaiffe, 2004):

(41) a. Adrenalin makes the heart pump blood faster;
dilates the airways of our lungs;
and causes a great increase in the release of energy.
[So what? What do all these things have to do with each other?]
b. In sum, it enables the body to be most efficient physically.

Explanation relations address actual or potential disagreements. A piece of information can be made easier to believe by pointing to observable *Evidence* (42) or by reference to an authoritative source, while *Motivation* is needed if the hearer might refuse to fulfil a request or answer a question.

(42) John must have been here recently.
[Why do you think so?]
There are his footprints.

The *Enablement* relation is another special case of *Explanation*, but can look very similar to a process-step *Elaboration*, cf. (43). Here the hearer cannot comply with the speaker's request in U_1 due to lack of necessary know-how.

(43) Please make me a poached egg.
[How do you make a poached egg?]
You boil some water with a bit of vinegar,
crack an egg into a bowl,
slide the egg gently into the water,
and cook for about 3 minutes.

[8] See also Benz and Jasinskaja (2017) and Hunter and Abrusán (2017) on the relation between QUDs and RRs.

Typical causal explanations like (36) deal with a very mild kind of anticipated disbelief: *surprising* events (people normally don't fall without reason) call for the mention of causes. Especially in narrative discourse, where the described events are expected to form a more or less continuous causal chain, events that do not follow naturally from the events related so far are felt to disrupt the continuity of the narrative. Causal explanations serve to repair such disruptions, supplying afterwards causes that the narrator should have mentioned before, but "forgot to".

In sum, it seems that whenever the speaker has to handle a grounding problem of some kind, he/she will produce a RR like *Elaboration* or *Explanation*, i.e. an RR traditionally counted as subordinating. It can be shown that the semantics of such RRs, such as identity and part-whole relations between entities and events in *Elaborations* and causal relations in *Explanations*, can be derived as a semantic side effect of establishing in which of the above-mentioned ways the second utterance repairs the first. For example, the fact that the expressions *anacrusis* and *an unaccented note which is not part of the first full bar* in (40) refer to the same entity follows from the fact that the speaker, trying to deal with the understanding problem, has used the second to express the same meaning as was intended by the first. Similarly, when the speaker addresses a potential disbelief issue, as in (42), the second utterance is supposed to *cause* the addressee to believe the first utterance, which corresponds to the conditions for epistemic causal relations, cf. also (5-b).

It is perhaps less clear whether the reverse is true, i.e. whether all instances of *Elaboration*, *Explanation*, and other relations tranditionally included in the list of "subordinating RRs" and showing the effects predicted by the Right Frontier Constraint can be characterized as repairs for some kind of grounding problem. For instance, in (2) repeated below it is hard to imagine that the speaker would produce (44-a) without originally intending to produce (44-b) as well, and would only produce (44-b) as a reaction to some "problem".

(44) a. I did two things on my seventy-fifth birthday. John Scalzi, *Old Man's War*
b. I visited my wife's grave. Then I joined the army.

A proper analysis of such cases goes beyond the scope of this chapter. However, here are some directions in which this analysis could go. One possibility is that speakers *do as if* they commit an error and repair themselves, entirely for the sake of the semantic side effects mentioned above. In (40), the speaker might be deliberately using an expression unknown to the hearer in order to introduce the term by means of a reformulation (cf. discussion in Blakemore, 1993). In *Specifications* like (35) and many standard cases of process-step *Elaboration* like (44), the speaker seems to deliberately produce a pragmatic "false start"—an utterance that is so underinformative that its relevance is difficult to assess (or an utterance that is out of place from the point of view of the canonical structure of the narrative, see Polanyi, 1978). In this way the speaker claims the floor for his/her (possibly quite extended) turn at talk by provoking questions (of "pragmatic" understanding) in the hearer. For the hearer it does not matter whether the error is real or fake. Either way, he/she would have to keep U_1 on hold until U_2 is processed and whatever was problematic about U_1 is clarified. Another possibility is that cases like (44) satisfy the definition of subordination (38) in some other way, not related to grounding. For instance, if the goal of (44-a) is to claim the floor for the two subsequent utterances in (44-b), then this goal is reached not sooner than (44-b) is completed.

In sum, we have proposed a definition of discourse-structural subordination, according to which the communicative goal of the subordinating discourse unit cannot be reached before the communicative goal of the subordinate unit is reached. On the one hand, it follows naturally from our definition that subordinate structures need a stack memory model for their processing, which in turn explains their special role with respect to the Right Frontier Constraint. On

the other hand, we have sketched out one specific interpretation of the relationship between the goals of the subordinate and the subordinating unit—the goal of the subordinate unit is to solve a grounding problem during the interpretation of the subordinating one. It turns out that this goal is best served by *Elaborations* and *Explanations*—the most prototypical instances of subordinating RRs in traditional classifications. In other words, the proposed definition comes closer to the standards set by the work of Kehler (2002) and developed further in this chapter: Like Kehler's definition of e.g. resemblance relations both predicts which RRs should belong to this class and how they should influence anaphora resolution, our definition of subordination predicts which RRs can function as subordinating and, again, how they affect anaphora resolution. As for marking patterns, we have seen in section 3.2 that untill now there is no evidence from the semantics of discourse markers for a unified semantic category of subordinating RRs. However, see Jasinskaja and Karagjosova (2011) for some remarks on the ability of subordinating RRs to be properly unmarked in light of the proposed approach.

4 Conclusion

In this chapter we set out to introduce rhetorical relations, explain what they are and what they are good for, and especially what questions linguists should ask when they want to find out if a particular rhetorical relation or group of relations "exists". The most important question is: Does that (group of) relation(s) manifest itself in language use? Decades of research in this area have shown that the most important linguistic manifestations of RRs lie in the domains of discourse marker usage and anaphoric phenomena in a broad sense. These insights led to the identification of such major classes of RRs as resemblance relations, causal relations, contiguity relations, subordinating vs. coordinating relations, as well as a large number of specific RRs. At the same time, rhetorical relations are ways in which discourses cohere. Therefore, understanding their abstract essence is a necessary part of understanding the principles of discourse coherence. Ideally, each relevant class of RRs should be defined in such a way that its definition reveals the underlying principles of coherence, determines which specific RRs belong to that class, and predicts their linguistic behaviour. In this chapter, we have proposed a definition of the class of subordinating RRs following these criteria.

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