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**ARBEITSGRUPPE 6 | WORKSHOP 6**

Raum | *Room*: S 12, Seminargebäude

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**Signaling discourse relations: Exploring (non-)connective cues**

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Discourse relations, such as cause-consequence or contrast relations, can be signalled in many different ways: ‘routine’ ways with classic discourse connectives or cue phrases such as *because* and *as an example*, and ‘creative’ ways with other lexical or non-lexical cues, such as grammatical structure. A considerable amount of research is concerned with connectives and their effects: Corpus-based work has provided insight into how connectives can be used, resulting in the creation of connective lexica in various languages (collected in *Connective-Lex*, Stede et al., 2019); experimental work has shown that connectives facilitate the processing of relations, but to different degrees, e.g., depending on the expectedness of the relation.

Compared to the fairly large body of literature on connectives, much less is known about non-connective signals. Interest in these signals has increased in recent years, evident by the release of the *RST Signalling Corpus* (Das & Taboada, 2018), which describes signals such as semantic, syntactic, and graphical features. There is early evidence that such signals, although less clear cues than connectives, do affect comprehension and processing. For example, Crible et al. (2021) show that syntactic parallelism facilitates the processing of contrastive relations, and that this effect is greater for non-native readers than for native readers.

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## Forms and functions: implicitness of discourse relations

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Understanding the structure of discourse relations in the text represents two tasks for the recipients: identification of the discourse relation (i.e. revealing the very connection between two arguments in the text) and its semantic interpretation. For explicit discourse relations, both the presence of the discourse relation and its semantic type are signaled by a discourse connective. In the case of implicit discourse relations, it is necessary to infer both from the content of potential arguments, or from additional signals, such as verb categories.

In a corpus-based analysis, we examined relations between several factors of discourse structure: semantics of a discourse relation (e.g., concession), syntactic realization (intra-sentential vs inter-sentential), and form of expression (explicit / implicit). We describe prototypical forms of different semantic types as they occur in the PDiT-EDA 1.0 corpus of Czech written texts (Zikánová et al., 2018). These results can be used for automatic prediction of discourse relations or for psycholinguistic studies on predicting discourse relations.

Some of the semantic types were further examined in self-paced reading experiments. We focused on the intelligibility of the implicit contrastive and temporal discourse relations. The results of the experiments show that explicit discourse connectives are important for the comprehension of contrastive relations; in temporal relations, they do not play a significant role.

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## What counts as a discourse signal?

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Discourse signals (connectives and non-connective signals) vary in strength (Asr & Demberg 2012); e.g., *and* is a weak ambiguous signal. Also, for a given relation the presence of a potential signal can be incongruous (Hoek et al. 2019), or sometimes even contradictory (Zeldes & Liu 2020); e.g., *antonymy* in an ELABORATION relation. Generally, the annotation of discourse signals in previous work, e.g., the PDTB corpus (Webber et al. 2018), follows a principle of “signal relevance”, annotating only the signals deemed relevant for the interpretation of the relation. Crible (2022) criticises this strategy, advocating and undertaking an annotation that includes all the signals present in a relation, irrespective of whether they signal the relation or not. The general question of what exactly makes a signal relevant for a relation remains implicit, however.

Our study focusses on the extent and the impact of non-contributing or even contradicting discourse signals. In this way, we want to contribute to a definition of the notion of “signal relevance”, but also to assess the gravity of the criticism levied against relevance-based signal annotation approaches. To this end, we examined about 1,000 discourse relations in the RST Signalling Corpus (Das et al. 2015) for signals relevant to the respective discourse relations, and also annotated those relations for all other potential signals present in them.

Annotating the full range of signals returned two more signals per relation on average, i.e., 50% more signals. They were restricted to a subset of the signals, in particular, lexical chains, and other semantic relations (especially repetition), reference, and indicative words (similar to PDTB “AltLexes”). Also, additional lexical chains typically showed up in relations where other lexical chains had already been annotated. Furthermore, the indicative words emerged as particularly hard to delimit (i.e., which words/phrases are indicative of what relations), which also triggered low inter-rater agreement. We conclude with some suggestions on how to define this group.

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**Defining a connective by the company it keeps:  
A corpus-based study on students' (creative) ways of expressing  
causality using polyfunctional 'e'**

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The use of semantically underspecified, polyfunctional connectives is often a matter of concern in the educational sector. Presumably a sign of less routinized writing that uses a reduced repertoire of elements, such connectives are expected to decrease the expressive argumentative power of the text by introducing unnecessary ambiguity (Calamai, 2012).

However, recent research on discourse relations is shifting the focus from discourse connectives to less investigated lexical or non-lexical cues (Das and Taboada, 2018), showing that connectives and other non-connective cues interact with each other, both in mutually exclusive and in redundant ways (Hoek et al., 2019) and that also non-connective cues play a role in facilitating comprehension (Crible et al., 2021). In our study, we investigate the interplay between the polyfunctional connective 'and' and connective and non-connective cues added to specify its meaning in the argumentative writing of students attending their 4<sup>th</sup> year of Italian upper secondary school in the Province of Bolzano/Bozen, Italy. In particular, we focus on causal uses of the Italian 'e' investigating connective and non-connective cues appearing segment-internally in the essays using Das's and Taboada's, 2014 tagset for signaling discourse relations. Moreover, we compare the patterns found in our corpus with a reference corpus of comparable edited texts, to assess the differences between expert and non-expert writers.

Through the results of our corpus exploration we will discuss the students' ability to create texts using either routinized, frequent and conventionalized ways, or more *ad-hoc* ways of signaling discourse relations.

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## Connectives as processing instructions across languages.

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A large body of literature has shown that connectives influence discourse processing. However, Blumenthal-Dramé (2021, henceforth: BD) found the facilitative effect of a connective to be larger in German than in English. This might be due to the typological nature of the two languages: words in synthetic languages (like German and Polish) tend to provide less information compared to more analytic languages (like English), forcing speakers of the latter type of language to rely more on contextual information, rather than on the connective. In the current study, we aim to replicate and extend this finding by investigating (a) whether there are cross-linguistic differences in the effect of connectives on on-line processing and if so, (b) whether these effects can be attributed to differences in the degree of analyticity of the language. We will present the findings of two studies, each comparing English with Polish and German.

In a sentence continuation task, native speakers read small texts. The final sentence of the text ended in either the underspecified connective ‘and’ only or an additional causal connective (i.e. ‘and so’). The continuations were annotated for whether or not it is causal. In a self-paced reading study, participants will read 20 small texts containing a target sentence pair that is causally related. This causal relation was again either marked by a causal connective or not. An extract is presented below:

- (1)
- a. Lisa was very tired [and so]<sub>P</sub> [she fell asleep early]<sub>T</sub> [and I]<sub>S</sub>
  - b. Lisa war sehr müde [und ist deshalb]<sub>P</sub> [früh eingeschlafen]<sub>T</sub> [und ich]<sub>S</sub>
  - c. Julia była bardzo zmęczona [i dlatego]<sub>P</sub> [zasnęła wcześniej]<sub>T</sub> [i ja]<sub>S</sub>

We will examine the effect of condition and language on reading times of the target (T) region and the spill-over (S) region. We expect that these regions are read faster in sentences with a causal connective than in those without. Crucially, this effect is hypothesized to be larger in Polish and German, compared to English, as would be shown in an interaction between language and condition.

By investigating cross-linguistic differences in coherence marking, the present contribution will shed more light on how structural differences between languages affects which sources of information - lexical or contextual - readers draw on when processing language.

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## Do connectives improve the level of understandability in mathematical modeling tasks?

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Previous studies (e.g. Sanders & Noordman 2000) give reason to assume that the use of connectives has a positive effect on comprehension, as they help to understand discourse relations in a text. However, there is no empirical evidence yet on whether and in which way connectives affect the formation of a coherent mental model when it comes to understanding mathematical modelling tasks. It is also unclear whether certain groups of students may benefit particularly from the use of connectives. Based on previous studies, it can be assumed that students with lower language skills (Becker & Musan 2014) and readers with little prior knowledge and interest in the topic (Kamalski 2007) are the ones to benefit most from the explication of coherence relations through connectives.

For this reason, for this study, six mathematical modelling tasks have been varied to create two identical variants, differing only in terms of whether coherence relations are explicitly expressed by connectives or are expressed implicitly. In order to test which of the two text versions enables 7th to 10th grade students ( $n= 390$ ) best to form a proper situation model, the students were asked to firstly solve mathematical tasks on the text. In addition, they were asked to answer so-called bridging inference questions (following McNamara & Kintsch 1996) on discourse relations expressed in the text. Initial evaluations show that students with low language proficiency did indeed perform better on the bridging inference questions when they had read the text version in which the discourse relations were made explicit through connectives. In contrast, students with high language proficiency were able to answer the reading comprehension questions slightly more often if they had read the text version without connectives. The opposite was true when it came to solving the mathematical tasks. Here, the linguistically strong students performed better after reading the more explicit version of the text, while the solution rate of the linguistically weak students even decreased. It seems, therefore, that although linguistically less proficient students benefit from the use of connectives when forming the situation model, they are then unable to use this advantage to solve the mathematical tasks.

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## Why stop talking? The contribution of ‘stopping’ gestures to discourse management

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Recognizing language as inherently multimodal is not nearly as radical as it once was (McNeill 1985). In the last two decades, significant attention has been paid to incorporating co-speech gesture into formal semantic models (e.g. Lascarides & Stone 2009; Schlenker 2020). However, the same cannot yet be said for models of discourse structure, despite the well-documented use of interactive and pragmatic gestures in face-to-face interaction (Bavelas et al 1992).

This paper looks at two recurrent manual gestures used to ‘stop’ some action in an ongoing discourse: (i) ‘blocking’ gestures in which a speaker directs their open palm toward their interlocutor, as if to stop an object from entering their immediate bodily space (Wehling 2017), and (ii) ‘one-second’ gestures in which a speaker points upward with their index finger, as if to say “wait a second”. The ‘stopped’ discourse action may relate either to the speaker’s contribution or to an addressee’s potential interpretation. I explore the ways in which this polysemy is reflected in the polysemy of accompanying lexical discourse markers. All data comes from television interviews gathered using the UCLA Television News Archive.

In particular use contexts, stopping gestures are highly conventionalized – they can be used in the absence of speech to convey a pre-specified meaning. Blocking gestures are used as a command to stop movement, and are fully grammaticalized as signs in ASL and BSL. The one-second gesture can be used as a silent request to wait, and is incorporated into other emblematic gestures such as the “shush” gesture. When used with speech, it is more difficult to identify a conventional, pre-specified meaning. Both gestures occur in a wide range of use contexts, with and without co-expressive lexical discourse markers.

The misalignment in distribution of discourse management gestures on the one hand and lexical discourse markers on the other suggests that the two modes of expression contribute meaning independently. I argue that this misalignment between modes can help us to better understand the multidimensionality of discourse relations.

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**The interaction of syntactic and prosodic cues on clausal  
prominence and reference resolution**

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The prominence status of referents in a discourse seems influenced by subordination: in configurations with a main clause and a subordinate clause, cf. (1a), the second clause-subject is subsequently less frequently pronominalized than when the second clause is also a main clause, cf. (1b) (e.g., Miltsakaki, 2011). We argue that this is the result of the relative prominence of the propositions, for which syntactic subordination is but one cue. Another is the type of prosodic boundary separating the clauses. We investigate how syntactic and prosodic cues direct the interpretation of clauses in complex causal sentences as more or less integrated, which in turn affects the accessibility of the referents contained within each clause.

145 German native speakers heard audio recordings of mini-discourses containing two subject referents of the same gender. Discourses consisted of a main clause followed either by a subordinate clause (causal *weil* + verb-final, (1a)), or a main clause (causal *denn* and V2, (1b)). The interclausal prosodic boundary was also manipulated: as a rise (H%) or fall (L%). A following third clause contained an ambiguous pronoun as subject of a nonce verb. Participants were asked which of the two subject referents the pronoun referred to (2x2, forced-choice).

- (1) Nadja hat vegane Burger gekauft  $\begin{cases} H\% \\ L\% \end{cases}$   
*Nadja has vegan burgers bought*  
 a. weil Sabine kein Fleisch isst. Sie *daupte*. [main-sub]  
*because Sabine no meat eats. She dauped*  
 b. denn Sabine isst kein Fleisch. Sie *daupte*. [main-main]  
*because Sabine eats no meat. She dauped*

More ambiguous pronouns were expected to be resolved to the first clause-subject in the main-sub condition (1a) than the main-main condition (2b), since main clauses are more prominent than subordinate clauses (e.g., Miltsakaki, 2011). An interaction effect obtained such that in the main-sub condition, H% effected higher resolution for the first referent than L%, while in the main-main condition, this trend was reversed. This complicates the picture of the role of prosodic boundaries for integration in the literature (cf. e.g. Sanfelici et al., 2020).

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## Exploring the interplay between discourse connectives and non-connective cues in simultaneous interpreting

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Studies on interpreting have found that interpreters both add and omit a considerable amount of discourse connectives (e.g. Gumul, 2006; Defrancq, Plevoets, K. & Magnifico, 2015), thus reshaping the discourse structure of the source speeches (Defrancq et al., 2015). These studies did not include non-connective cues in their analyses and only looked at the presence of connectives in both source and target speeches.

This study wants to contribute to a more complex understanding of how discourse relations are marked in interpreting. From the perspective of the source speech, I look at how compensatory non-connective cues additional to discourse connectives affect the target. Building upon Lapshinova-Koltunski, Pollkläsener and Przybyl (2022) I focus on contrastive and concessive connectives, assuming that the presence of additional cues reduces cognitive load for the interpreter.

For my analyses, I use the sentence-aligned EPIC-UdS-Corpus, which contains original speeches in English and their simultaneous interpretations into German. I query the source texts for all instances of the connectives *but/however*, remove all non-connective uses and manually annotate the presence of non-connective cues in the source. The annotation of non-connective cues is based on Crible (2022). She identified antonymy and parallelism as predictive signals for contrast and found a relative tendency between negative and different polarity and contrast and concession. The matches will be classified into groups depending on the translation option used by the interpreter (explicit connective, equivalent connective, implicit connective, total deletion of connective in target). In the analysis, I check if the presence of non-connective cues have an influence on the use of translation strategy. In my presentation, I will report on the results of this work-in progress.

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**Comprehension of complex sentences with temporal connectives:  
How children are led down the event-semantic kindergarten-path**

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The sequence of sentences frequently reflects the order of events encoded by the clauses, resulting in iconicity (Diessel 2008), which may be overtly marked by lexical cues (e.g., *after* in (1a), *before* in (1b)). We can sidestep iconicity, however, by using temporal connectives non-iconically ((1b) for *after*, (1a) for *before*).

- (1) a. After/before he ate an apple, he read a letter.  
b. He read a letter, after/before he ate an apple.

Extending previous research on children’s comprehension of sentences with *before* and *after* (e.g., Clark 1971, de Ruiter et al. 2018), we tested 60 monolingual Greek-speaking children (aged 6–11) with a sentence-picture matching task manipulating Iconicity (iconic/non-iconic) and Conjunction (*before/after*), see (1). A GLMM with Iconicity and Conjunction as fixed effects revealed a main effect of Iconicity and an interaction of Iconicity\*Conjunction. Tukey-adjusted pairwise comparisons showed differences between *after\_ionic* and *after\_nonionic* ( $p=0.002$ ) and between *before\_nonionic* and *after\_nonionic* ( $p<0.001$ ). This pattern suggests that violation of iconicity negatively affected comprehension of *after* but not of *before*. We propose that this asymmetry regarding iconicity can be accounted for by an event-semantic kindergarten-path effect: in languages with clause-initial connectives like English or Greek, non-iconic *after*-sentences (1b) are more difficult than their iconic variant (1a), because the sentence-medial connective forces the listener to integrate a subordinate event into the—already processed—main clause event and to revise the initial event order. Non-iconic *before*-sentences (1a) are not harder than their iconic variant, because sentence-initial *before* serves as an early cue of the non-iconic order, so no reanalysis of the event-representation is needed. The event-semantic kindergarten-path effect predicts that children should master non-iconic *before* earlier than non-iconic *after*. This was borne out in our results; 23 children had mastered non-iconic *before* but not non-iconic *after*, whereas no child had mastered non-iconic *after* but not non-iconic *before*. If our proposal applies to comprehension more generally, adults are expected to show an event-semantic kindergarten-path under the right conditions in reading.

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## Exploring the sensitivity to alternative signals of coherence relations: The case of French-speaking teenagers

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While the use and comprehension of connectives have been studied in different categories of speakers (see e.g., Cain & Nash, 2011), less is known about the functioning of alternative signals of coherence relations (but see e.g., Scholman et al., 2020), especially in younger populations. Moreover, there is even less evidence about how different alternative signals of coherence relations interact with connectives (but see Hoek et al., 2019). It is not clear, for instance, whether alternative signals are strong enough to generate an inference of a certain coherence relation even in the presence of connectives.

In the current study, we assessed the sensitivity of French-speaking teenagers ( $N=149$ ,  $M_{\text{age}}=14.33$ ,  $SD=1.75$ ) to the alternative signals of a list relation (words such as *plusieurs* ‘several’ and *différents* ‘various’), combined with connectives varying in frequency and signalling two types of coherence relations (addition: *en plus*, *en outre*; consequence: *donc*, *ainsi*). In addition, we contrasted the results obtained by teenagers with those of a group of adults ( $N=63$ ,  $M_{\text{age}}=28.62$ ,  $SD=9.98$ ).

The results revealed that both groups of participants were sensitive to list signals, as they produced more continuations expressing a list relation when one of the alternative signals was present in the task. However, teenagers' receptiveness to list signals was inferior to that of adults. The inference of list relation was, however, not significantly increased when an alternative signal was combined with the more frequent additive connective *en plus*. As for the combination of an alternative signal with the less frequent additive connective *en outre*, it inhibited the inference of list relation. In contrast, the consequence connectives *donc* and *ainsi* almost completely hindered the production of list continuations.

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## The role of connectives in L1 and L2 discourse illusions

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Linguistic illusions take place when violations (e.g. on the grammatical or semantic level) are frequently overlooked. Illusions at the level of discourse have not yet been investigated, but could potentially arise when discourse relations (DR) are not fully processed. The aim of this contribution is to establish: whether discourse illusions arise in a systematic manner; whether they arise more frequently in L2 compared to L1 processing; and the contribution of the connective type to discourse illusions. The discourse connective “on the one hand...on the other hand” sets up an expectation of contrast (Scholman et al., 2017). In (1), arguments in favour of Laura going out have been presented with “on the one hand”. Contrasting arguments should thus be presented with “on the other hand”. However, in (1), a further argument in favour is presented instead, constituting a violation at the level of DR.

- (1) Laura is thinking about going out tonight. On the one hand, she feels like dancing, because a great DJ will be playing. On the other hand, she can sleep in tomorrow. She is finding it difficult to decide.

Using an acceptability judgment paradigm (1–7 scale), we tested whether discourse violations like (1) are overlooked by L1-German–L2-English speakers (n=184). Judgments for violations were expected to be highly variable in comparison to control conditions. Two factors (Violation: violation; control, and Language: German; English) were manipulated to create four conditions for each experimental item (n=24). Each participant was tested in both their L1 (German) and their L2 (English), providing a within-participant comparison. Three types of discourse connective were tested: *contrast*, *similarity* and *denial of expectation*. Data was analysed using Bayesian ordinal models (effects expressed as SD units). Overall, discourse violations behaved like other linguistic violations that give rise to illusions in that control items were rated higher than violation items (0.26 [0.13, 0.38]) but bad fillers were rated lower than violations (-0.48 [-0.73, -0.22]). Participants were more susceptible to illusions in their L2 compared to their L1, with German violations eliciting lower ratings than English violations (-0.42, [-0.51, -0.33]). Regarding connectives, denial of expectation causes more illusions than contrast but not similarity, though this interacts with language. The appearance of discourse violations suggests that DR are not always fully processed, in particular in the L2, and that certain types of discourse connectives (and the DR that they signal) may be more susceptible to incomplete processing.

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## Verbal implicit causality and discourse connectives in Romanian sentence production

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This is the first study exploring the way in which different Romanian classes of verbs affect production in terms of upcoming discourse relations and next mention preferences. We explore how these effects interact with connectives.

**Participants.** 56 monolingual native Romanian speakers participated.

**Materials and Design.** Two same-gendered human referents were introduced and we manipulated the verb class and the continuation type (“because” vs. “full stop”). The verbs belonged to one of the four classes: Stimulus-Experiencer (SE), Experiencer-Stimulus (ES), Agent-Patient (AP), Patient-Agent (PA) (Goikoetxea et al. 2008). Participants added one sentence continuation to each item. The 1886 continuations were annotated with respect to (i) choice of subsequent mention and (ii) discourse relations. We expect to obtain more subject continuations for SE verbs and more object continuations for ES verbs (Hartshorne et al. 2013) and overall more explanation continuations (Bott & Solstad, 2014).

**Preliminary Results.** First, SE verbs were more subject-biased (at least 70%) than the ES verbs. These effects were amplified in the because-condition: 91% of SE verbs were subject-biased and 91% of ES verbs were object-biased. The PA verbs showed a robust tendency of the initial object to be re-mentioned (89%), irrespective of the presence of the connective “because”. The AP verbs, on the contrary, showed a similar pattern (70%) only for the “full-stop” condition. The presence of the connective “because” reversed this tendency in favour of the subject (76%). Second, while the presence of the connective “because” is a strong predictor of the discourse relation to be used (i.e. at least 80% explanations), the distribution of the discourse relations associated with the four verb types following a full stop reveals differences in terms of strength and coherence type. PA verbs prefer explanations in 92% of cases, while ES and SE verbs prefer them in 66% and 52% of cases respectively. For AP verbs, participants preferred elaborations (47%) and results (23%) rather than explanations (25%).

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## Influence of German modal particles on the perception of discourse relations

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German modal particles (e.g., ‘ja’ and ‘doch’) can add expressive meaning to a proposition (Zimmermann 2011) and thereby help to interpret discourse. They also have a discourse-structuring function by relating a proposition to the Common Ground (Stalnaker 2002). Therefore, they should have an influence on how discourse and relations between discourse units are perceived.

The present study investigates how the perception of relations between discourse units changes during reading when German sentences do or do not contain modal particles. Rojas-Esponda (2014) and Döring & Repp (2019) argue that some particles (like ‘doch’) are used to facilitate a certain understanding of discourse. I hypothesize that if discourse relations represent how a reader perceives the coherence of a text and discourse markers affect comprehension and processing of relations, then the absence of a discourse marker should affect how certain discourse relations are perceived.

66 participants were tested in a self-paced reading experiment using 36 sentences. The sentences were taken from a social media corpus (Scheffler et al. forthcoming) which was annotated for discourse relations (Mann & Thompson 1988). The sentences were presented with and without modal particles. After reading the sentences, participants were asked to answer a question aiming at the discourse relation. Results show that leaving out a modal particle in a sentence does not lead to more unexpected answers about the discourse relation nor is the mean reading time at the end of a sentence higher if the sentence does not contain a modal particle. This suggests that German modal particles by themselves do not influence how discourse relations are interpreted by the reader.

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## Exploring Connective Cues with Translation Process Data

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We focus on the phenomena of explicitation and implicitation in translation through discourse connectives looking into translation process data. Explicitation is observed when a translated text contains discourse connectives not present in the source or more specific connectives are used instead of more general ones in the source (Klaudy and Károly, 2005, p. 15). Implicitation is an opposite phenomenon. The increased or reduced usage of discourse connectives, their impact and conditions in both human and machine translation have been analysed in numerous studies (Olohan and Baker, 2000; Blum-Kulka, 1986; Becher, 2011; Meyer and Webber, 2013; Zufferey and Cartoni, 2014; Hoek et al., 2015). We will analyse explicitation and implicitation from a cognitive perspective. For this, we will use the data from an English-German study contained in the CRITT translation process database (CRITT TPR-DB, Carl et al., 2016). This database has been collected over years and contains a substantial amount of translation process data from numerous translation sessions. The process data includes various features that elicit online translation behaviour. The data is parallel, so that we are able to inspect the translational pairs of English discourse connectives in the sources and their translations into German. In our presentation, we will report on the results of this work-in progress.

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## Cross-linguistic differences in discourse marking: A case study of German-English texts

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We present results on the cross-lingual alignment and annotation of discourse relations (DRs) in English-German parallel texts from the Europarl corpus, which is part of our project to create large parallel discourse-annotated corpora and lexicons in various languages.

The DiscoGeM Corpus (Scholman et al., 2022) includes crowdsourced annotations of about 400 DRs in English texts that were translated to German and 700 DRs in English texts translated from German, extracting from 15 and 18 documents respectively. We aim at creating a PDTB3-styled discourse annotated dataset with these documents where all explicit and inter-sentential implicit DRs are annotated and cross-lingually aligned. The process involves below steps:

1. English and German explicit DRs are identified together with the argument spans and classified into different sense types using the shallow discourse parsers (English: Knaebel 2021, German: Bourgonje, 2021).
2. The identified connectives are aligned using a combination of neural and statistical word alignment models (Östling and Tiedemann 2016, Dou et al. 2021). A focus is on the null alignments produced by the aligners, which reveals cases of implication and explication.
3. Implicit German DRs (consecutive sentences that are not connected by an explicit connective), and implicit English DRs not annotated in the DiscoGeM, will be annotated in two-step crowdsourcing annotation methodology (Yung et al., 2019)

The resulting dataset will allow us to extract a distributional bilingual connective lexicon for English and German, and provide data for the study of implication and explication of DRs in translation.

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## The expression of substitution in Italian: a corpus-based analysis

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The aim of my contribution is to propose an analysis of the strategies used to express the substitutive contrast in spoken Italian and to identify possible correlations between the use of certain strategies and the communicative context.

According to the literature, the substitutive relation can be encoded through:

- subordinative configurations ([*sub. conj.* p], [q] or [q], [*sub. conj.* p]);
- coordinative/juxtapositive configurations ([p], [(*subst. conn.*) q]);
- paratactic correlatives configurations ([*neg.* p] (and) [(*subst. conn.*) q]);

for each of which Italian possesses a set of dedicated markers: *invece* (*di/che*) (instead (of/that)), *piuttosto* (*che*) (rather (than)), *anzi/anziché* (rather (than)) and *bensì* (but).

However, in this contribution I hypothesise that the above-mentioned strategies constitute only a part of the repertoire available to the speaker to express substitution and that the communicative context can be particularly relevant in choosing one or the other strategy.

In order to verify the foregoing, I used the KIParla corpus (Mauri et al. 2019) and in particular the KIP module. This module in fact contains free conversations, lectures, examinations, student receiving and semi-structured interviews, thus enabling the analysis of diaphasic variation phenomena.

What emerged from an initial pilot investigation is that in spoken usage, and particularly in less formal communication contexts, less specific strategies (but equally effective in expressing the relation under investigation) are often used. Such non-traditional strategies consist of non-conjunctive lexical items that acquire substitutive value only in given contexts (profrastic *no*, adverbs *in realtà/in verità* (in fact/ in truth)). In other cases, there are no explicit strategies at all, and the two entities are connected by simply belonging to the same 'semantic field' and to the same syntactic unit.

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**Intonation contours as signals of discourse relations in German**

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It is generally agreed that intonation in German is used to distinguish declarative from interrogative sentences. However, recent studies showed (Selting 1995; Bergmann 2018; Moroni 2020) that it contributes along with other levels of language description to characterize an utterance as expressing a specific communicative activity and goal in interaction. Drawing on these insights, we argue that intonation can signal discourse relations and that this function may better explain the distribution of different intonation contours in conversational sequences than the connection with the category of sentence mode.

In our study, we investigate the role of the nuclear rising-falling contour (see Figure 1) in a private informal conversation between speakers of the urban variety of Freiburg German. This variety displays a rising-falling contour in its intonational inventory, which previous works classified as typical of isolated utterances and answers (Peters 2006: 423) or as occurring in narrative interviews as a turn-concluding signal (Gilles 2005: 111, 317-327).

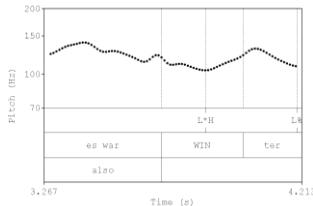


Figure 1. (FOLK\_00066, utterance in line 665)

For every collected utterance we consider the following levels of analysis: (i) syntax, (ii) position of the utterance in the conversational sequence, and (iii) type of the communicative activity. In addition, we look with a bottom-up approach for further possible relevant parameters such as recurring semantic-pragmatic features.

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**Linguistic markers of discourse coherence:  
Insights from corpus and experimental data**

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Cognitively oriented linguists have various resources at their disposal and need to develop methodological strategies of when to use which method. By focusing on causal relations and their linguistic markers in discourse, I will illustrate the benefits of the methodology of using converging evidence and show what kinds of insights this brings at the level of discourse coherence. Research results from several methodologies will be discussed, including the use of corpus-based studies of causal connectives, in both spoken and written discourse, in various languages.

Results from processing experiments, including eye-tracking and other production and interpretation studies, reveal how online relation processing proceeds, indicating the role of connectives as processing instructions (Sanders & Evers-Vermeul, 2019), but also showing a crucial role for prosody in distinguishing between objective versus subjective causal interpretations in English (Hu et al., 2022). The results suggest that Causality and Subjectivity are two cognitive principles that organize our knowledge of coherence relations. They help us explain the system and use of causal relations and their linguistic expressions in everyday language use, and they account for discourse processing and representation. Finally, the status of descriptive and cognitive adequacy (Scholman et al., 2022) will be discussed.

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**Effects of domain knowledge and discourse cues on comprehension  
of discourse relations across narrative and expository texts**

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We ask whether domain knowledge affects readers comprehension of discourse relations. As shown by Marchal et al. (2022), domain experts are better in interpreting discourse relations in domain-specific texts than non-experts. Also, experts can better deal with texts with low cohesion marking than non-experts (McNamara et al. 1996, Kamalski et al. 2008). Focusing on the impact of register on comprehension, we investigate how experts and non-experts perform across narrative vs. expository texts. For narrative texts, word knowledge is sufficient for comprehension, while for expository texts domain knowledge is crucial (cf. Mar et al. 2021). We extract narrative texts from fiction corpora and expository texts from textbooks of the mechanical engineering domain (each N=27 with 2-3 sentences) for Elaboration, Concession and Causality (top-occurring connectors used for item extraction for both registers and each relation; narrative items: pre-tests run for unambiguous usage of connectors; expository items: judgments of a mechanical engineer expert). A prescreening study (Prolific) served recruitment of mechanical engineers. Non-experts are from the medical domain (min. BA degree). In the insertion task, both groups saw narrative and expository stimuli with no discourse connector. Participants had to insert a connector from a list of options. Preliminary results show a similar performance for narrative texts by experts (N=13) and non-experts (N=17). For the expository texts, experts performed better than non-experts. Accuracy was higher for narrative than expository texts (experts outperforming non-experts in the latter). For Concession, we considered high vs. low cohesion marking (i.e. negation, modality or none). Negation facilitated both groups, especially non-experts with expository texts. In absence of any cues, experts were more accurate than non-experts with both types of registers. Thus, domain knowledge seems to be crucial to infer coherence relations in domain-specific texts, but specific cues facilitate comprehension for non-experts.

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**German *so* as a discourse marker of speech-act level *explanation***

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German “manner, quality and degree” (Umbach & König 2018) demonstrative adverb *so* (‘so’, ‘thus’) has a clearly non-demonstrative use like in (1), which is frequent in elaborated informative texts:

- (1) Wir hatten Garnelen und eine kleine Scholle in unserem Fangnetz. [...] Natürlich gibt es noch viel mehr Meerestiere. **So** sind über 100 Fischarten im Wattenmeer anzutreffen.  
‘We caught shrimps and a little plaice in our catchall. Of course, there are much more sea animals. *So* one meets more than 100 kinds of fish in the tidelands.’  
(from a geography school book)

I label it ‘forefield-*so*’ (*so<sub>VF</sub>*) and argue that *so<sub>VF</sub>* is a grammaticalization of the demonstrative in the sense of Traugott (1995): *so<sub>VF</sub>* loses its demonstrative features, i.e. deictic or anaphoric reference, as well as its adverbial features, i.e. its free constituent-like position in a sentence. Instead, it gets restricted to the forefield position and functions as a discourse connector, signalling overtly an *explanation of an assertion*, i.e., a causal, positive, speech-act relation in the taxonomy of Spooren & Sanders (2008).

In my talk, I address the syntactic status of the *so<sub>VF</sub>* and its semantic and discourse pragmatic features. In particular, I show that although *denn* (‘because’) and *so* both mark a non-propositional level explanation, there are important syntactic and semantic differences between these two; these differences might explain the need of a new discourse marker here and be the reason of the grammaticalization of *so<sub>VF</sub>*.

With some results of an explorative corpus study, I try to sketch the development of *so<sub>VF</sub>*. Comparing the data of the 19<sup>th</sup> century with contemporary data shows a clearly decreasing semantic and pragmatic flexibility with *so* as a syntactic clause-connecting device on the way to a discourse marker.

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