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## **(In)Coherence of discourse 4**

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Jokulsson

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# (In)Coherence of discourse 4

Loria – room C005

<http://discours.loria.fr>

Thursday 30th and Friday 31st March 2017

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## Preface

We are pleased to provide the proceedings of the 4th Workshop (In)Coherence of Discourse, (In)Co 2017, which was held in Nancy, France, during March 30–31, 2017. Previous (In)Co conferences were held in Nancy (2015, 2014, 2013).

The proceedings of this fourth edition comprise two invited contributions, by Alain Lecomte (emeritus professor of Université Paris 8), and Ellen Breitholtz and Christine Howes (University of Gothenburg). We received 12 submissions and the scientific committee has chosen 6 contributed papers. Each paper received three reviews, provided by the Program Committee, listed herein.

We would like to thank all those who submitted papers for consideration at (In)Co2017, the two invited speakers, and all conference participants. We want to thank our international team of reviewers. We very much hope that all these comments will be of use to those who submitted papers for their future research.

We are also grateful to our institutional sponsors and supporters : the computer science laboratory in Nancy (LORIA), the linguistic laboratory in Nancy (Atilf), the philosophy and history of science laboratory (AHP-LHSP), the interdisciplinary laboratory (MSH-L), the French National Institute for Computer Science and Applied Mathematics (Inria), the National Center for Scientific Research (CNRS), the University of Lorraine and the Région Lorraine. We would also like to express our gratitude to the Organizing Committee and all the people whose efforts made this meeting possible.

March 2017,

Maxime Amblard,  
Manuel Rebuschi,  
Michel Musiol

## Program

### Thursday March 30th 2017

- 13 :30 Registration and opening
- 14 :00 *Ellen Breitholtz and Christine Howes* - Dialogical reasoning in Patients with Schizophrenia
- 15 :00 *Karolina Krzyzanowska, Peter Collins and Ulrike Hahn* - Between antecedents and consequents : discourse coherence vs. probabilistic relevance
- 15 :50 Break
- 16 :10 *Jayez Jacques and Robert Reinecke* - Processing Presuppositions : An ERP Investigation
- 17 :00 *Mathieu Frerejouan* - Les limites du principe de charité en psychopathologie
- 17 :50 End of the first day

### Friday March 31st 2017

- 09 :00 *Alain Lecomte* - Un modèle formel des réparations de pannes du discours
- 10 :00 *Christophe Fouqueré and Myriam Quatrini* - Which Answers are expected ?
- 10 :50 Break
- 11 :10 *Bart Geurts* - Self talk : a matter of commitment
- 12 :00 *Maria Silvano, António Leal and Fátima Oliveira* - Signalling rhetorical relations in participial and gerundive clauses in European Portuguese
- 12 :50 End of the workshop

**Alain Lecomte**

professeur émérite Université Paris 8

**Title :** Un modèle formel des réparations de pannes du discours

**Abstract**

Le langage nous apparaît d'abord sous la forme du dialogue, c'est-à-dire de l'interaction entre locuteurs. Contrairement à une conception courante en sémantique formelle qui voudrait que les échanges se fassent sur la base de sens fixés une fois pour toutes, le sens se renégocie toujours en fonction du contexte. Nous jetterons les bases d'un modèle formel qui permet de représenter le dialogue comme un jeu dont les règles elles-mêmes peuvent être négociées. Dans ce modèle, inspiré de la ludique, on définit une notion de normalisation analogue à celle qui est utilisée en théorie de la preuve. Un dialogue « normal » est un dialogue qui converge (en un sens très précis que nous définirons). Dans ce processus de normalisation apparaîtront toujours des pannes, des failles se traduisant sous forme d'incohérences. L'une des compétences que possède le sujet parlant réside dans sa faculté à réparer ces incohérences. Le modèle proposé sera apte à mettre en lumière cette compétence.

**Ellen Breitholtz and Christine Howes**

University of Essex, School for Computer Science and Electronic Engineering

**Title :** Dialogical reasoning in Patients with Schizophrenia

**Abstract**

In this talk we will present an outline of our new project (DRiPS; with Robin Cooper and Mary Lavelle), discuss some of the central issues and report some preliminary results.

One of the most debilitating features of schizophrenia is patients' difficulty interacting with others. An important part of successful interaction is the ability to reason – about the relationship between the discourse and the world, and also about other dialogue participants' reasoning. We hypothesise that the social cognition impairments seen in patients with schizophrenia are underpinned by difficulties associated with the resources used in reasoning as it occurs in everyday interaction.

We will present our unique corpus of patients' triadic interactions, and show preliminary results that indicate that verbal and non-verbal behaviours are manifest differently in dialogue by patients with schizophrenia. Further, the presence of a patient also has effects on the dialogue behaviours of their healthy interlocutors, even though they were unaware of the patients' diagnosis.

We then show how Type Theory with Records (TTR) can be used to model how people reason in natural language dialogue, using enthymemes, and how this reasoning ability is different in patients with schizophrenia.

# Which Answers are expected?

Christophe Fouqueré and Myriam Quatrini

One of the main difficulties in analysing dialogues concerns the way interventions are expected or not with respect to a dialogue. We argue that the framework we develop may help understanding this phenomena. Close in some way to Ginzburg's theory of dialogue [3], our proposal is in the perspective of recent philosophical positions [1]: interaction is ontologically the primitive fact of language. This is why we choose Ludics as our formal framework: a logical theory developed by J.Y. Girard [4], for which interaction is ontologically the primitive concept.

## A Frame for a Dialogue Theory

Our model of dialogue is organized in two levels, that we may intuitively compare to the two modes of interaction in Ludics. With respect to the first level, that considers the dynamics of a dialogue, a dialogue is seen only as an alternate sequence of interventions among which we may distinguish the one which initiates the exchange and the one which eventually ends the exchange. Interventions are only considered according to (i) their role in the flow of interventions: one intervention is anchored on a previous one and opens possible continuations of the dialogue, (ii) the fact that they are produced by one locutor while they are in the same time received by the other locutor. We interpret interventions by means of *dialogue acts* that express entitlements or decisions of the speaker, and also its acknowledgment by the addressee. This first level captures the surface of a dialogue [2] as a cut elimination between two formal proofs, in other words, as a confrontation between two strategies, that is, in terms of Ludics, as a *closed interaction between two designs*. By this way, it enables to pay attention to the notion of convergence/divergence in the dialogue.

In order to take care of other dimensions of dialogue, in particular to account the content of these interventions, but also to make explicit the aspects of convergence/divergence, we complete the modelisation by adding a second level. We set a *cognitive base* for each locutor. A cognitive base contains, roughly speaking, the various knowledges and abilities used for building utterances as well as for receiving and recording them. Formally, these elements are represented by *designs*. Open interaction between these designs, that is cut elimination between formal proofs as a calculus, enables to account for various operations, for example: updating, inferential executions...

## Expected/Non Expected Answers

We consider a basic example of **divergence**:

EXAMPLE: An ethnologist **P** conducting a survey and interviewing a native **N** restitutes the following dialogue:

– *P* “All the Kpelle cultivate rice ( $P_1$ ). Mister Smith does not cultivate rice ( $P_2$ )”. “Is Mister Smith a Kpelle?”  
– *N*: “I do not know, I do not know M. Smith.”

To analyse this example, we use the **convergent** dialogue that  $P$  anticipated:

–  $P$ : “All the Kpelle cultivate rice ( $P_1$ ). Mister Smith does not cultivate rice ( $P_2$ ). “Is Mister Smith a Kpelle?”

–  $N$ : “No, he is not.”

We consider seven steps in this dialogue, and we focus on only a few facts of our modelisation:

- the four first ones corresponds to the informations successively given by  $P$ , and their reception by  $N$ . At the level of cognitive bases, the two utterances  $P_1$  and  $P_2$  (more precisely the two *formal proofs* or *designs*), are initially contained in  $P$ 's cognitive base. In the ideal situation that we suppose, these utterance are correctly received by the addressee, that is they are successively recorded in his cognitive base (formally the designs are copied by means of a copycat strategy).

- The fifth and the sixth ones correspond respectively to the question asked by  $P$  and the answer given by  $N$ . If at the level of the surface of the dialogue, both are modeled each by a unique dialogue act, creating a unique locus on which anchor the continuation of the dialogical exchange, what happens at the level of the cognitive base is widely more complicated. To answer to  $P$ 's question,  $N$  has to make interacting two designs, the one associated with  $P_1$  and a design associated to the utterance “*M. Smith is a Kpelle.*”. The calculus of this interaction produces a new design: the one corresponding to the utterance “*Mister Smtih cultivates rice.*” Endly,  $N$  has to regnnaizes that this latter design and the one corresponding to  $P_2$  entails a contradiction. Therefore, he may produce the answer “*M. Smith is not a Kpelle*”. That is, he resolves the contradiction by erasing in his cognitive base the design that he added transitorily: “*M. Smith is a Kpelle.*”

- The last step is not expressed explicitly in this dialogue:  $P$  may consider that the answer given by  $N$  is sufficient and ends properly the dialogue. At the surface of dialogue, the dialogue act denoting the convergence is played.

The comparison between the divergent dialogue and the ideal convergent one that we started to describe above, may help to identify the missing cultural competences useful for a logically correct answer. Beyond this example our modeling provides us with tools for making explicit lacks in cognitive bases.

## References

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- [3] Jonathan Ginzburg. *The Interactive Stance: Meaning for Conversation*. Oxford, 2012.
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## Les limites du principe de charité en psychopathologie

Mathieu Frerejouan

Le « principe de charité », d'après lequel toute interprétation d'un discours suppose de postuler la rationalité du locuteur, a souvent été invoqué ces dernières années dans le champ des sciences humaines (Bonney & Cozik, 2011). Si son introduction en psychopathologie est aussi légitime que dans les autres disciplines, elle apparaît même comme nécessaire dans le cas des patients schizophrènes dont le discours a longtemps été décrit comme irrationnel (Rochester & Martin, 1979). Or, si l'on ne saurait remettre en cause l'usage que l'on peut faire d'un tel principe en psychopathologie, on peut néanmoins interroger la signification et la portée qu'on doit lui attribuer. En effet, ce dernier est avant tout invoqué dans des situations de « logicité forte » (Rebuschi et al., 2013), où l'on a pu ainsi montrer que l'incohérence logique du patient devait être attribuée à un usage déviant des règles pragmatiques et conversationnelles (Ribeiro, 1994 ; Musiol et al., 2009 ; Rebuschi et al., 2013) plutôt qu'à un illogisme de la pensée. Mais si cet usage du principe de charité est assurément légitime dans le cas d'une *désorganisation* du discours, sa limite est toutefois que l'apparente irrationalité du patient schizophrène ne se limite pas à des problèmes de cohérence logique.

C'est notamment le cas du *délire* qui, tout en étant perçu comme irrationnel, se manifeste néanmoins comme possédant sa propre cohérence. Ainsi, un trait courant des patients schizophrènes est de dire entendre des voix « dans leur tête », tout en croyant qu'il s'agit là d'interlocuteurs réels, à la manière de cette patiente qui croit que la voix qu'elle entend dans sa tête est aussi responsable du vol de ses vêtements (Guigo-Banovic et al., 2003, 2005, 2009). Une interprétation en apparence charitable de ce type de discours, défendue en psychologie cognitive (Maher, 2006), serait de considérer le délire comme l'explication rationnelle de l'expérience anormale à laquelle le schizophrène est confronté. Cependant, comme l'a montré Louis Sass, cet usage du principe de charité revient à occulter les contradictions du délire au lieu de les défaire (Sass, 2003). A rebours de cette conception du délire comme croyance fautive, il propose ainsi une autre conception de la charité, où le discours du patient est éclairé par la nature paradoxale de l'expérience délirante (Sass, 2010).

Cependant, on peut se demander si par cette interprétation Sass ne dépasse pas les limites du principe de charité. En effet, les normes de rationalité que le discours délirant transgresse ne sont pas tant des règles logiques, ce qui légitimerait une interprétation charitable, qu'un type particulier de croyances dont Wittgenstein a montré qu'il s'agit de « propositions empiriques que nous affirmons sans les vérifier » parce qu'elles « jouent un rôle logique particulier dans le système de nos propositions empiriques » (Wittgenstein, 1958, §136). En contredisant ces

propositions empirico-logiques le discours délirant se présente alors non pas comme un énoncé qui ne pourrait avoir de sens dans un certain contexte, mais comme un énoncé qui ne peut avoir de sens dans notre propre système référentiel. C'est pourquoi il est tout aussi erroné de le considérer comme absolument incompréhensible que de le réduire à nos propres règles grammaticales en appliquant le principe de charité.

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## Self talk: a matter of commitment

Bart Geurts

People talk not only to others but also to themselves. The self talk we engage in may be overt or covert, and is associated with a variety of higher mental functions, including reasoning, problem solving, planning and plan execution, attention, and motivation (Winsler 2009). When talking to herself, a speaker borrows linguistic devices from her mother tongue, originally designed for interpersonal communication, and employs them to communicate with herself. This transition from social talk to self talk is reflected in our folk psychology: wondering if it will rain tomorrow, I “ask myself” whether it will rain; I “tell myself” to do the dishes and “promise myself” an espresso when I’m done; I “remind myself” to lock the door when leaving my office; and so on. Asking, telling, promising, and reminding are originally social acts, but when addressed not to others but oneself, they come to function as modes of thinking: wondering, making up one’s mind, motivating oneself, and so on. The question I want to address is how this is possible.

To answer that question, we need a theory of communication that explains how the same linguistic devices can be used to communicate with others and oneself. I argue that the intention-based approach which currently represents the majority view fails this requirement, and a different approach is called for: instead of focusing on the psychology of speakers, communication must be viewed as a form of social interaction in which speakers negotiate commitments between them, if we want account for the continuity between social talk and self talk, and the transition from the former to the latter.

Commitment is usually viewed as a three-place relation  $C$  between two individuals,  $a$  and  $b$ , and a propositional content  $\varphi$ . I read  $C_{a,b}(\varphi)$  as “ $a$  is committed to  $b$  to act in accordance with the truth of  $\varphi$ ”, and hypothesise that every speech act creates a commitment of this form, where  $a$  is the speaker and  $b$  the addressee. Promising is the paradigm case. If Don promises Mel to do the dishes, for instance, his speech act brings it about that  $C_{\text{Don},\text{Mel}}(\text{Don will do the dishes})$ . Due to Don’s committing himself in this way, Mel becomes entitled to act on the premiss that he will do the dishes, and thus Don’s commitment helps Mel to coordinate her actions with Don’s. That’s what commitments are for. Other speech act types are analysed along the same lines.

Commitments divide into two main types: telic and factual (cf. Walton and Krabbe 1995). Don’s promise creates a telic commitment: it is his goal to do the dishes. Statements create factual commitments. If Don tells Mel, “Vladimir sent me such a sweet Christmas card”, the content of his commitment is a proposition about the past, but it constrains his *future* actions, for Don is now committed to act in the future on the premiss that Vladimir sent him a Christmas card in the past.

Whereas in social talk, people exchange commitments of the form  $C_{a,b}(\varphi)$ , where  $a \neq b$ , in self talk, speaker and addressee coincide, and therefore  $a = b$ . Thus, self talk creates *private* commitments, whose purpose is to enable the speaker to coordinate his *own* actions. For instance, by promising himself, “I’ll do the dishes”, Don makes a commitment to himself to do the dishes, which enables him to coordinate his own actions.

Like all commitments, private commitments are either telic or factual. Private telic commitments are intentions: if Don is committed to himself to do the dishes, then he intends to do the dishes (cf. Bratman 1987). Private factual commitments are beliefs. To see this, consider the following case. Mel is trying to remember where her phone is. She weighs and rejects various possibilities, until she finds herself left with one option only, and concludes: “It’s in the kitchen.” By telling herself that her phone is in the kitchen, Mel addresses a statement to herself, thus creating a private factual commitment to act in accordance with the premiss that her phone is in the kitchen. That is to say, Mel has formed the belief that her phone is in the kitchen.

To sum up, unlike the more popular, intention-based approach to communication, our commitment-based approach provides a unified treatment of other-directed and self-directed speech acts. It predicts that addressing speech acts to oneself is a way of creating private commitments, that is, commitments of the form  $C_{a,a}(\varphi)$ , which will be either intentions or beliefs. This explains how what is originally a social act can come to function as a mode of thinking.

Although I have contrasted my commitment-based approach to communication with the intention-based approach inspired by Grice, and argued that the latter is ill-equipped for dealing with self talk, this was not meant as an outright rejection of the Gricean account. Just as it can hardly be denied that speech acts cause commitments on the part of the speaker, there is little reason to doubt that speakers perform speech acts with more or less specific intentions, which at least occasionally are of interest to their addressees. If this much is true, the two approaches are trained on different aspects of communication, and complement each other. Still, I argue that commitments come before intentions, phylogenetically, ontogenetically, and in everyday communication, be it with others or oneself.

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## Processing Presuppositions: An ERP Investigation

Jayez Jacques and Robert Reinecke

The extensive linguistic literature on presupposition triggers has highlighted a number of properties that differentiate Main Content (MC) and Presupposition (PP), in particular with respect to projection [3, 5, 9, 21], non-answerhood [10] and restrictions on discourse attachment [8, 12, 13]. From a more theoretical perspective, there have been various attempts to define a specific status for PP, most notably in terms of dynamism [2, 13, 20], anaphoric reference [7, 9] or transparency [17]. It seems fair to say that most ‘classic’ approaches to PP claim to have empirical evidence for an asymmetry between MC and PP. In addition, the Stalnakerian pragmatically-oriented version of a MC/PP asymmetry has also attracted attention from other scientific domains [6, 15]. The existence of a systematic asymmetry is under debate in more recent approaches, which discuss the role of context or pragmatic strategies in the interpretation of PP [4, 16, 18, 19]. In this general context, there are at least two options to pursue: (i) the linguistically manifested distinct properties between the MC and PP have a cognitive counterpart, in the form of an intrinsic processing difference and (ii) even though the MC/PP distinction is generally marked in language by conventional means, the processing difference, if any, results from the interaction of marking, meaning and pragmatic inference.

Given the variety of PP triggers and their properties across [21] and within [1, 13] languages, it is necessary to study different (classes of) triggers in separate experiments. We started with factive verbs, that is, verbs which, like know or realize, presuppose the truth of the complement clause [14]. Factive verbs have the unique property that the MC and the PP are both communicated by explicit material. The intuition behind the experiment is to tap into the processing of full factives sentences like *Michel knows that Pascal takes the bus* by comparing the effect of referring back to the MC (matrix) verb, i.e. *know*, and to the PP (embedded) verb, i.e. *take*. If the MC is intrinsically more central (novel, dominant, salient) than the (backgrounded, secondary, peripheral, less salient) PP, there should be a cognitive distinct correlate of processing the MC vs. the PP.

In the present study, using a rapid serial visual paradigm, two distinct experiments measuring event-related potentials (*Experiment 1* 22 participants ( $M = 20.68$ ,  $SD = 2.33$ ) and *Experiment 2* 21 participants ( $M = 20.94$ ,  $SD = 2.32$ )) aimed to investigate the time course of the MC and PP with respect to the semantic-thematic processing and also to the last phase associated with language processing, that is the phase associated with repair, interpretation and re-analysis.

The results show that there is neither a significant difference between both contents in the semantic-thematic processing phase nor during the last phase of language processing. The obtained results are compatible with the following hypothesis: the PP of factive verbs is as accessible as the MC when it forms the topic of an additive relation marked by *aussi* (too). Further research needs to investigate whether one would obtain similar results when the MC/PP focus and/or the discourse relation is different.

*Keywords:* experimental pragmatics, presupposition triggers, rapid serial visual paradigm, common ground, cognitive load



# Between antecedents and consequents: discourse coherence vs. probabilistic relevance

Karolina Krzyzanowska, Peter J. Collins, & Ulrike Hahn

Indicative conditionals, that is, sentences of the form “If  $p$ , then  $q$ ,” are some of the most widely studied phenomena of language. Despite long-standing interest, many basic questions about their interpretation remain unresolved. One puzzle is the oddity of so-called missing-link conditionals, such as:

- (1) If Russia is not a member of the European Union, raccoons cannot breathe under water.

A natural response to this phenomenon is to claim that a conditional conveys some kind of a connection between antecedent,  $p$ , and consequent,  $q$ . The nature of this connection is, however, a controversial issue.

Most accounts of conditionals in the philosophical and psychological literature (Bennett 2003; Evans and Over 2004) validate an inference rule called “Centering” that allows to infer “If  $p$  then  $q$ ” from the truth of  $p$  and  $q$ . The proponents of these accounts do not deny that sentences such as (1) are odd but claim that their oddity is due to pragmatics (see, e.g., Cruz et al. 2016). It is not clear, however, how pragmatics can account for this phenomenon.

One could argue, for instance, that antecedents and consequents need to be connected, because speakers expect *any* consecutive elements of discourse to be connected in some way. Discourse, after all, is not a random collection of sentences (Asher and Lascarides 2003). In most cases, unless signalled otherwise,  $p$  and  $q$  are expected to at least be on the same topic. Yet, plausibly, we intuitively expect to find a stronger connection between antecedent and consequent of a conditional than just any discourse coherence relation. One candidate is probabilistic relevance, conventionally operationalized as a  $\Delta p$  rule: whenever  $\Delta p > 0$ , where  $\Delta p$  is understood as a difference between  $\Pr(q|p)$  and  $\Pr(q|\neg p)$ , we say that  $p$  is positively relevant for  $q$ , while  $\Delta p = 0$  indicates irrelevance (see, e.g., Skovgaard-Olsen et al. 2016).

**The experiment.** We investigated whether people expect a stronger connection between the antecedent and consequent of a conditional than between other consecutive elements of discourse. More specifically, we aimed to disentangle the effect of probabilistic relevance from (mere) discourse coherence. We compared how people evaluate conditionals with how they evaluate the consequents of those conditionals in conversational contexts in which the antecedents have already been asserted.

Our test factorially combined probabilistic relevance (positive relevance, irrelevance) and discourse coherence, which gave us the following conditions for within-participant comparison: *positive relevance & the same topic* (PR-ST), *irrelevance & same topic* (IR-ST), *irrelevance & different topic* (IR-DT). These conditions were combined with a between-participant manipulation of type of discourse (conditionals, conversational exchanges).

**Results.** As Figure 1 shows, the absence of a common discourse topic renders both the conversational exchange and the conditionals equally unassertable. The conventional and robust analyses agreed on the following picture. There was a significant interaction of probabilistic relevance and type of discourse. Probabilistic relevance had a significant effect for both conditionals and exchanges, but the effect was considerably more pronounced with conditionals. Type

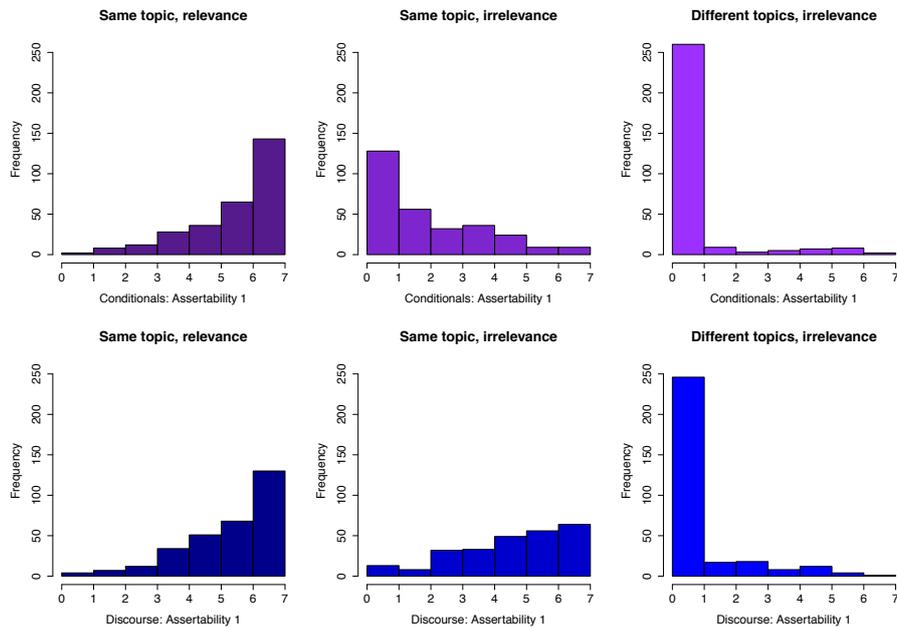


Figure 1: Assertability ratings for conditionals and for conversational exchanges.

of discourse had a significant effect only with irrelevant items: with relevant items, conditionals and exchanges did not differ significantly.

**Conclusion.** Our data support the hypothesis that people expect a stronger link between the clauses of an indicative conditional than between other consecutive elements of discourse. Patterns of responses diverge when the clauses are on the same topic, but when the antecedent is not probabilistically relevant for the consequent. In these cases, self-standing discourse elements are moderately assertable, while conditionals are mostly judged to be unassertable. This allows us to conclude that a conditional is assertable only if its antecedent is relevant for the consequent. A coherence relation between  $p$  and  $q$  (which may be sufficient to make  $q$  a natural response to  $p$  in a conversation) is not sufficient for a conditional “if  $p$  then  $q$ ” to be assertable. Conversely, this means that the lack of discourse coherence is not a sufficient explanation for the oddity of missing-link conditionals. This poses a challenge to any account of conditionals that does not posit the need for a connection between antecedent and consequent.

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### Signalling rhetorical relations in participial and gerundive clauses in European Portuguese

Sentences with non-finite adverbial clauses (NFA) can convey different rhetorical relations (RR) in European Portuguese (EP), which can be easily identified whenever there is a discourse marker (DM) present (cf. (1)). In most of these cases, the lexical information carried by the DM is sufficient to infer the relation of meaning. The task becomes much more difficult when NFA are not introduced by any DM (cf. (2)). In these cases, we have to rely on other information sources. Our aim in this presentation is to determine how the RR are signalled in NFA, in particular, gerundive and participial clauses that are not introduced by any DM.

- (1) *Logo que anunciada a ideia, as mulheres aderiram maciçamente a ela. (Corpus)*  
*As-soon-as that announced the idea, the women adhered massively to it.*  
*As soon as the idea was announced, the women adhered massively to it.*
- (2) *Anunciada a ideia, as mulheres aderiram maciçamente a ela.*  
*Announced the idea, the women adhered massively to it.*  
*As soon as the idea was announced, the women adhered massively to it.*

Asher & Lascarides (2003)'s theoretical framework includes RR whose inference depends on two sorts of information sources: linguistic (the most relevant), as lexicon and compositional semantics, and non-linguistic, as world knowledge. These sources, combined with the semantics of RR, provide the necessary knowledge to compute RR. Within linguistic sources, tense, aspect and lexicon play a crucial function (Asher & Lascarides (2003), a.o.; for EP, Silvano (2010), Cunha & Silvano (2008), a.o.). Regarding lexicon, the relevance of certain cue-phrases is undisputable and they have been central for automatic annotation of RR (cf. Penn Discourse Treebank and RST Discourse Treebank). However, not all RR are signalled by cue phrases and the same cue-phrase may signal different RR (Silvano (2010)). Thus, other lexical units and the relation they establish with each other are essential to solve underspecification (cf. Pustejovsky (1995), Asher & Lascarides (2003), Taboada (2013)). In fact, to fully capture the process of inference of RR, and to be able to extract them automatically, we have to consider other ways of signalling them, besides DM (cf. Taboada (2009; 2013)).

In the sequence of works such as Cunha, Leal & Silvano (2008) and Leal, Silvano & Oliveira (2016) for the EP, the main problems we intend to address in our research are: (i) which rhetorical relations are conveyed by sentences with gerundive and participial clauses? (ii) which linguistic information sources intervene in the process of inference of rhetorical relations in the absence of DM?

We will show that in EP there is a correlation between the temporal and aspectual nature of the participial and gerundive forms and the type and diversity of RR that are available in these structures. To achieve this goal, we built a newspaper genre *corpus* to be annotated manually with RR.

Our analysis led to some conclusions. With respect to sentences with participial clauses, there are some constraints as to the aspectual type of predications that are compatible with this type of clauses. Most of the predications that occur in participial clauses are telic and this aspectual feature limits the RR that can be ascribed to these sentences. However, some data shows that atelic predications are also possible. In these cases, the clause of participle does not locate the situation of the main clause in the resultant state, which allows for different temporal relations and different RR between the situations represented by the two clauses. By default, the temporal relation established between the situations in these structures is temporal successivity and the RR that we infer is Narration (cf. (2)). Nevertheless, there are also cases with a temporal relation of overlapping, which blocks the inference of Narration (cf. (3)).

- (3) *Vigiado o edifício, o João sentia-se seguro.*  
*Watched the building, the João felt (Imperfective Past) safe.*  
*While the building was being watched, João felt safe.*

As to the data of sentences with gerundive clauses, our analysis reveals that the simple gerund behaves differently from the perfect gerund. Following Leal (2001; 2011) hypothesis about the temporal information of the gerund, which is related to the Temporal Perspective Point (PPT) (cf. Kamp & Reyle (1993)) and partially determines the aspectual properties and temporal readings of the predications, we consider that in EP the simple gerund bears the feature [present] and the perfect gerund the feature [past]. These features influence the process of interpretation of this type of discourse. For instance, the temporal restriction imposed by the perfect gerund limits the RR that can be inferred whenever this form is present. Since the situation described by the gerundive clause is always anterior to its PPT, which is by default the time interval of the main situation, the RR available are the ones with the temporal consequence of anteriority between the gerundive clause and the main clause (cf. (4)). Nonetheless, when interpreting gerundive clauses, other factors can be responsible for other readings, such as the aspectual nature of the predication in the gerundive clause (eventive or stative), as well as the position of the gerundive clause regarding the main clause.

- (4) *Foi o caso (...) de uma vítima que, tendo sido colocada no porta-bagagens, que ficou mal fechado, acabou por cair à estrada. (Corpus)*  
*It was the case (...) of a victim who, having been placed in-the trunk, that stayed badly closed, ended by fall to-the street.*  
*It was the case (...) of a victim who, having been placed in the trunk, that wasn't properly closed, ended up by falling into the street.*

We argue that a global and systematic research of NFA, with a semantic approach of temporal and aspectual features, will not only lead to a better understanding of the mechanisms of processing RR, but also improve their production and comprehension in automatic processes like translation and automatic sentence reduction. The expected result of our proposal is a contribution to a better understanding of (i) the temporal and aspectual features of participial and gerundive adverbial clauses; (ii) the signals which can be used to identify the correct RR, manually and automatically; (iii) the meaning postulates of RR.

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