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The LogPrag project

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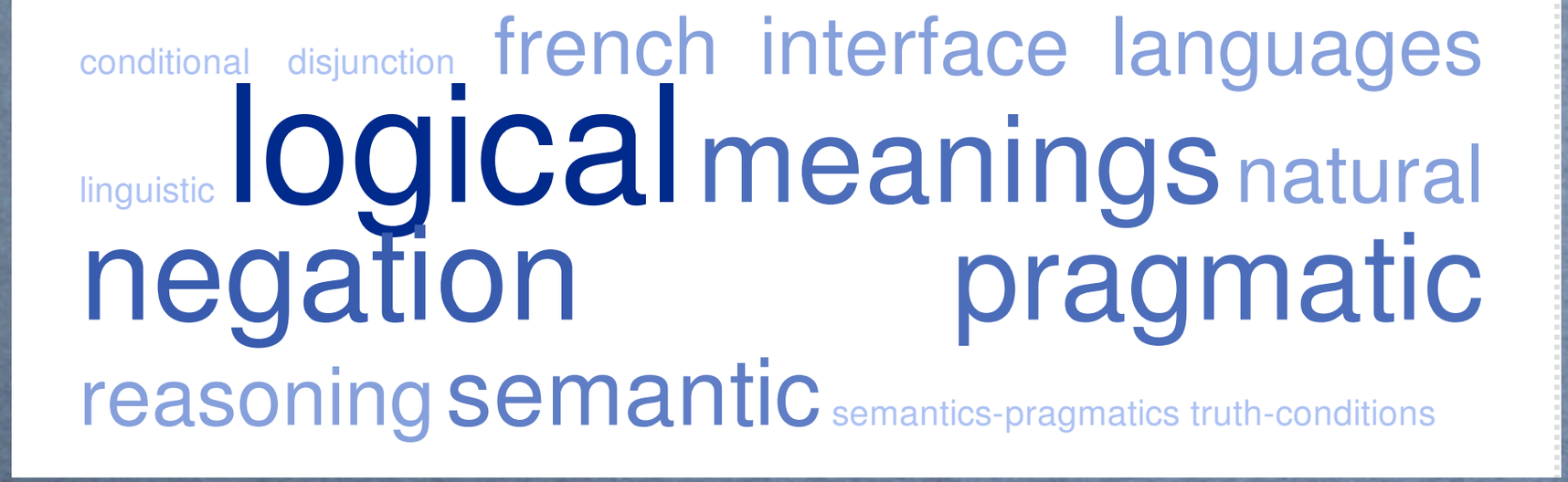

The LogPrag project

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The semantics and pragmatics of logical words:
a cross-linguistic perspective

What is LogPrag?

- The **logPrag project** is a research project submitted to the Swiss National Science Foundation
- It will be supported for 3 years (January 2014-December 2016)
  - One PhD student (Karoliina Lohivina)
  - One post-doc researcher (Joanna Blochowiak)
- Connection with different scholars and research centers
  - Jacques Jayez, L2C2, ISC Lyon
  - Denis Delfitto, Verona
  - Caterina Mauri, Pavia
  - Johan van der Auwera, Antwerpen

Logical words

- LogPrag has as main goal the semantics and pragmatics of **logical words**, limited to **logical connectives**, with a special emphasis on French and a comparative perspective (Finnish, Polish for instance)
  - Négation - *ne…pas*
  - Conjunction - *et*
  - Disjunction - *ou*
  - Conditional - *si*

Why logical words?

- LogPrag has a cognitive and a pragmatic motivation
  - **Cognitive motivation**: LogPrag aims to investigate the *function of logical words in human cognition*
    - What is the function of logical words with respect to reasoning and inference?
  - **Pragmatic motivation**: LogPrag aims to understand the *function of logical words in linguistic communication,* and more specifically their argumentative function
    - What is the pragmatic meaning of logical words in utterances?
    - How do they contribute to the conveyed meaning?

Logical words

- **LogWords** are linguistically realized in most languages
  1. They play a role in reasoning
  2. They have a precise semantics in formal languages (logic)
  3. Their semantics is not directly visible in the behavior of their linguistic counterparts
- **Research question n° 1**
  - ***Do LogWords have a logical semantics in natural languages?***
  - **LogPrag makes the prediction that the semantics of LogWords in natural languages are their logical meanings**

Classical and pragmatic approaches to LogWords

- 2 classical approaches to LogWords
  a. The formalist approach (Gazdar): the number of TFC in natural language is limited with respect to logical connectives
  b. the non-formalist approach (Ducrot): there is no connection between logical constants and connectives in natural languages
- How to overtake the traditional formalist-non formalist debate?
  - The LogPrag approach follows a third path, that is, a pragmatic one (Grice)

The LogPrag hypothesis

- LogPrag assumes that **the semantics of LogWords is the semantics of logical languages**
  - The difference in linguistic behavior does not lie at the semantic level, but at the pragmatic one
- **Research Question n° 2**
  - How to explain the difference between the **under-specified semantics** of LogWords and their **pragmatics**?
- The main hypothesis of LogPrag is the **Domaine Restriction Hypothesis** (DRH):
  - **LogWords have in natural languages a more specific meaning than their logical meaning**

HDR

	Logical semantics	**Pragmatics**
ne…pas	Propositional negation	Constituent negation - descriptive *vs* metalinguistic
et	Logical conjunction	Temporal, causal or contrast inference
ou	Inclusive disjunction	Exclusive, epistemic or ‘free choice’ meaning
si	Material implication	Bi-conditional, causal, Austinian or counterfactual meaning

1. RQs for Negation

- **RQ1**: How to explain negation **scope**?
  - Derivation of logical form (wide scope) and propositional form (narrow scope)
    1. x [ne P pas] → not(P(x)) → not-P(x)
    2. x [ne P pas] → not(P(x)) → P(not-x)
    3. Abi n'est pas brune
    4. Abi n'est pas brune, Félicie l'est
- **RQ2**: How to explain the **metalinguistic use** of negation?
  - Several issues
    - Contexts of use of negation
    - Orientation of negation with scalar predicates
    - Derivation of narrow/wide scope of negation

Examples

- **Contexts**
  1. *Abi n'est pas laide, au contraire elle est belle*
     a. NEG au contraire COR
     b. COR → NEG
  2. *Abi n'est pas belle, mais très belle*
     a. NEG mais COR
     b. COR → POS
  3. *Abi ne regrette pas d'avoir échoué, parce qu'elle a réussi*
     a. NEG parce que COR
     b. COR → NEG + PP
- **Orientation: semantic of contextual?**
  - *Abi n'est pas belle*
    a. not-P → less than P or more than P
    b. not-P → less than P
- **Derivation**
  - *Abi n'est pas belle*
    a. semantics

       NOT[ABI IS BEAUTIFUL]

    b. pragmatics

       ABI IS [NOT-BEAUTIFUL]
  - *Abi n'est pas belle, mais très belle*
    a. semantics

       NOT[ABI IS BEAUTIFUL]

    b. pragmatics

       NOT[ABI IS BEAUTIFUL] & [ABI IS GORGEOUS]

Contexts

- The context is defined by several criteria: entailments, scope, discourse relation, connectives, contextual assumptions, and contextual effects
- There is a convergence of criteria with three types of negation: downward (descriptive), upward and presuppositional (metalinguistic)

	Entailments	Scope	Discourse relation	Connectives	Contextual assum-ptions	Cognitive effects
Ordinary negation	COR → NEG	Set of entailments	CORREC-TION	*au contraire*	POS	~~POS~~
Upward negation	COR → POS	Restricted	CONTRAST	*mais*	POS	POS+
Presuppo-sitional negation	COR → NEG (P & PP)	Wide	EXPLANA-TION	*parce que puisque*	a. POS & PP b. NEG & PP	a. ~~POS~~ + ~~PP~~ b. ~~NEG~~ + ~~PP~~

Negation and negative orientation

1. *Anne n'a pas trois enfants*

→ Anne has two children

→ Anne has one child

2. *Anne n'a pas trois enfants, mais quatre*

→ Anne has four children

→ Anne has three children

→ Anne has two children

→ Anne has one child

Explanation: COR is necessary only with an upward negation, because the set of entailments is not equal to its scope

Scope of negation

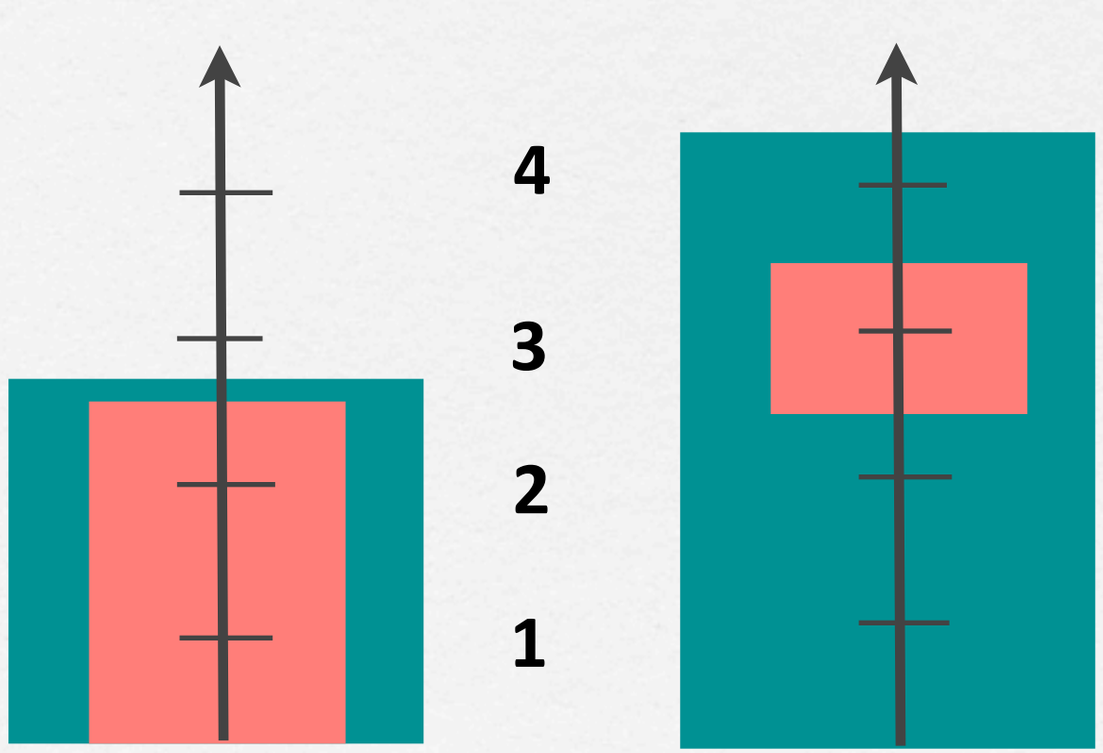
Entailments and scope of (1)

children

Entailments

Entailments and scope of (2)

children



Derivation

- In LogPrag, the semantics of negative utterances is wide scope
- It is only in pragmatic derivation that scope can be restricted to predicate, or preserved as in metalinguistic negation

1. *Le roi de France est chauve*
2. *Le roi de France n'est pas chauve: il n'y a aucun roi de France*

- **Semantics**
  - non[le RdeF est chauve]
- **Pragmatics**
  a. Le RdeF est non-chauve
  b. non[le RdeF est chauve] → non[le RdeF existe]

2. RQs for Conjunction

- **Asymmetric uses** in natural languages : *P et Q* ≠ *Q et P*
  - Logically, truth conditions of *P et Q* are the same as for *Q et P*
- How to explain the temporal, causal and contrastive use of *et*?
  - Classical pragmatic analyses describe these meanings as **implicatures** (maxim of order, principe-I, principle-R)
  - In Relevance, the pragmatic meaning of *et* is the result of an **explicature**
- **Research questions** on conjunction:
  - **RQ1**: What are the linguistic factors (aspectual classes, tenses) and the pragmatic ones (contextual) triggering **temporal order** with *et*? (Moeschler 2000)
  - **RQ2**: which are the principles triggering causal explicature with *et*? (Moeschler 2011)
  - **RQ3**: How to explain the contrastive use of *et*?

Examples

1. *a. Si la république a été déclarée et le vieux roi est mort, alors Tom sera content.*
   b. Si le vieux roi est mort et la république a été déclarée, alors Tom sera content (Cohen)
   - Argument in favor os the explicature analysis: et contribtutes to the truth-conditions of the utterance
2. *a. Nath a tourné la clé et le moteur a démarré* (Levinson)
   b. J'ai été arrêté, et mon meilleur ami m'a trahi (Horn)
   - Argument agains the forward encoding of conjunction
   - Argument in favor of the pragmatic enrichment of conjunction
3. *a. Abi est intelligente et belle.*
   b. ? Abi est intelligente, mais belle.
   - Argument in favor of **conceptual constraints** for the contrast reading of conjunction
4. *a. Marie a trois doctorats et elle est au chômage. C'est quand même scandaleux…*
   b. Marie a trois doctorats, mais elle est au chômage. Elle aurait dû voir venir les choses…
   - Argument in favor of **pragmatic constraints** for the contrast reading of conjunction

3. RQs for disjunction

- The logical meaning for disjunction is **inclusive**
  - The inference on a disjunction (*modus tollendo ponens*) allows to conclude to one of the disjunct if the other is false
    - *P ou Q, non-P* ⊢ Q
  - In its exclusive reading, *ou* signals the speaker's ignorance
- **RQ1**: What are the contexts of use for a disjunction?
- **RQ2**: How to explain the narrowing from **inclusive** to **exclusive** meaning?
- **RQ3**: How to explain the free choice reading?
- **RQ4**: What is the relation between conjunction and disjunction?

Examples

1. *a. Ta mère est dans la cuisine ou à la salle de bain.*
   b. Fromage ou dessert.
   c. Ça passe ou ça casse!
   - Exclusive reading of disjunction, implying the speaker's ignorance, the free choice reading and an alternative one.
2. *a. 3 personnes ou 240 kg*
   b. 3 ans ou 100'000 km
   - Contextual possible inclusive reading and conditional reading of disjunction
3. a. *Marie ou Pierre viendra.*
   b. Marie viendra et Pierre ne viendra pas ou Marie ne viendra pas et Pierre viendra.
   - The disjunction (exclusive reading) entails a disjunctive conjunction
   - *P ou Q → (P et non-Q) ou (non-P et Q)*
     - The truth-value of *(P et non-Q) ou (non-P et Q)*
     - are those of exclusive disjunction

The disjunction meaning as an implicature?

- Following the theory of **scalar implicatures**, *et* and *ou* belong to a Horn's scale:
  - <*et, ou*>,
    - *P et Q* → *P ou Q*
    - *P ou Q* +> *non*(*P et Q*)
- Where is the issue?
  - The scalar implicature is not compatible with the exclusive meaning of the disjunction
    - *non(P et Q)* ↔ *non-P ou non-Q*
  - *P* and *Q* can be false together in the implicature meaning
  - With the exclusive meaning, *P* et *Q* cannot be false together
    - *Fromage ou dessert* ⇎ *non-fromage ou non-dessert*

A summary of LogPrag's research questions

1. What type of pragmatic **meaning** is added to logical meaning?
    - Is it an **implicature** or an **explicature**?
        - If it is an **implicature**, it is non-truth-functional (cf. the conjunction and disjunction counterexamples)
        - If it is an **explicature**, how does the under-specified meaning trigger the correct pragmatic one?
2. Which **procedure** must be followed to obtain pragmatic meaning from logical meaning?
    - How to compute narrow scope reading of negation from wide scope?
    - How to block negation narrowing in metalinguistic uses?
3. Is logical meaning more costly than pragmatic meaning? Or is the pragmatic meaning more costly?
    - Why do natural languages encompass pragmatic specification?
    - How to test for cognitive load in pragmatic meaning?

LogPrag three components

1. **Descriptive component**
   a. Description of **French LWs** uses in contrast with **languages having more connectives** (Polish, Serbian, etc.)
      - Polish: *i* (*and*) vs *a* (contrastif *and*)
      - Serbian: *i* (temporal simultaneity) vs *pa* (temporal order) vs *a* (atemporal)
   b. **Connectives uses in non-logical relations**
      - **Disjunction in yes/no questions**
        i. Swiss French: *Tu viens **ou bien**?*
        ii. Polish: *czy* for polar questions and disjunction
2. **Theoretical component**
   a. **Pragmatic meaning derivation** (scope, pragmatic enrichment)
   b. **Explicature or implicature?** Truth-conditional or non-truth-conditional meaning?
3. **Experimental component**
   a. How much **costly** is pragmatic derivation?
   b. Is metalinguistic negation more costly than ordinary, descriptive negation?

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Thanks for your attention

... and join the LogPrag project!