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MODELING DIALOGUES IN A DYNAMIC THEORY OF TYPES

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IN OTHER WORDS

A_1 Do you want coffee or tea?

A_1 Do you want coffee or tea?

B_2 Yes!

A₁ Do you want coffee or tea?

B₂ Yes!

- Natural Language Processing (NLP)
- Semantics of Natural Language
- Semantics of dialogues
- Statistical NLP **VS** Formal NLP?

A₁ Do you want coffee or tea?

B₂ Yes!

- Natural Language Processing (NLP)
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- Statistical NLP **VS** Formal NLP?
- Formal NLP **then** Statistical NLP!

DATA, DATA, DATA

Transcriptions of conversations in English between college students in Illinois (US) in an informal setting.

Transcriptions of conversations in English between college students in Illinois (US) in an informal setting.

A₁ When will you guys get off?

B₂ My last exam is like...I don't know, maybe on Monday or on Tuesday...

A₁ Vous décollez quand les gens?

B₂ Mon dernier exam est...je sais pas, peut être lundi ou mardi...

Recordings and transcriptions of philosophical (semi-guided) conversations in French between children from 6 to 10 years old and an adult.

Recordings and transcriptions of philosophical (semi-guided) conversations in French between children from 6 to 10 years old and an adult.

A₁ À qui vous osez pas poser des questions?

B₂ À ceux qu'on connaît.

A₃ Ah, ça c'est ceux à qui tu oses poser des questions?

B₄ Oui.

A₁ Who do you not dare to ask questions?

B₂ People we know.

A₃ Oh, those are ones who you dare ask questions?

B₄ Yes.

Anonymised transcriptions of semi-structured interviews in French performed by psychologists with either patients with schizophrenia under medication, patients with schizophrenia without medication or control patients (without any known diagnosis)

[Rebuschi et al., 2014].

A₁ Oh ouais et pis compliqué et c'est vraiment très très compliqué **la politique** c'est quelque chose quand on s'en occupe **faut être gagnant** parce qu'autrement quand on est perdant c'est fini quoi

B₂ Oui

A₃ J. C. D. **est mort**, L. **est mort**, P. **est mort** euh (...)

B₄ Ils sont morts parce qu'ils ont perdu à votre avis

A₅ Non ils gagnaient mais **si ils sont morts, c'est la maladie** quoi c'est c'est

A₁ Oh and it's complicated and **politics** is really very complicated, it's something when you do that, you **need to win** because otherwise when you lose it's the end you know

B₂ Yes

A₃ J. C. D. **is dead**, L. **is dead**, P. **is dead** hum (...)

B₄ They died because they lost, according to you

A₅ No, they were winning but **if they died, it was out of sickness** you know it's it's

TYPE THEORY AND ALL THAT

[de Groote, 2006]

Types:	individual/entity	ι
	proposition	o
	context	γ

[de Groote, 2006]

Types: individual/entity ι
 proposition o
 context γ

Mary loves Jane.

$\lambda e k. \text{love } j \ m \wedge k(m :: j :: e)$

e	γ
k	$\gamma \rightarrow o$
j, m	ι
love	$\iota \rightarrow \iota \rightarrow o$

REPRESENTATIONS

A₁ Vous habitez où?

B₂ À T.

A₃ C'est dans la ville de L.

B₄ Oui.

A₁ Where do you live?

B₂ In T.

A₃ Is it in the city of L?

B₄ Yes.

$$\left[\begin{array}{c} \text{LIVE} \\ \text{Ag: B} \\ \text{Loc: } \left[\begin{array}{c} \text{IS IN} \\ \text{Ag: T} \\ \text{Loc: L} \end{array} \right] \end{array} \right]$$

[Kallmeyer et al., 2015]






BACK TO THE PRESENT AND FUTURE

Frame Semantics Real-life examples (embedded frames)

RNNs Not enough data (generalization)

Inquisitive semantics Handling questions and answers
[Ciardelli et al., 2012]

Machine Learning Learning on logical representations
[Roberts and Demner-Fushman, 2016]

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THANK YOU.