

# **Polarity mood and coordination in French: data and analysis**

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# **I. BACKGROUND**

# Polarity mood (1)

- **"Polarity mood"** : subjunctive or indicative mood induced by negative polarity (most commonly negation) with predicates that exclude or disfavor it elsewhere in French and other Romance languages

1) a. Je pense que Jean est<sub>IND</sub>/\*soit<sub>SUBJ</sub> convaincant.

'I think that Jean is convincing.'

b. Je ne pense pas que Jean est<sub>IND</sub>/soit<sub>SUBJ</sub> convaincant.

'I don't think that Jean is convincing''

2) a. Je doute que Jean soit<sub>SUBJ</sub> /?est<sub>IND</sub> convaincant.

'I doubt that Jean is convincing.'

b. Je ne doute pas que Jean soit<sub>SUBJ</sub> /est<sub>IND</sub> convaincant.

'I don't doubt that Jean is convincing.'

## Polarity mood (2)

- **A long-standing issue:** is the apparent choice triggered by negative polarity semantically grounded or vacuous ? (e.g. Huot 1986 *contra* Gross 1978 for French)
- **A reconciling approach:** one mood, the one induced, is semantically motivated thanks to negation (see appendix 1), while the other one is grammaticalized, involving some homonymous head predicate frozen with the mood encountered in the affirmative sentence (cf. Godard & De Mulder 2011, Godard 2012)

1) a. Je ne pense<sub>1</sub> pas que Jean soit<sub>SUBJ</sub> convaincant.

b. Je ne pense<sub>2</sub> pas que Jean est<sub>IND</sub> convaincant.

'I don't think that Jean is convincing.'

2) a. Je ne doute<sub>1</sub> pas que Jean est<sub>IND</sub> convaincant.

b. Je ne doute<sub>2</sub> pas que Jean soit<sub>SUBJ</sub> convaincant.

'I don't doubt that Jean is convincing.'

# Coordination (1)

- **Semantic condition:** conjuncts must be of identical type and role (Gazdar 1980, Partee & Rooth 1983, Lang 1984)

1) a. Un de nos agents, Paul ou Jean, va vous recevoir.

'One of our agents, Paul or Jean, is going to receive you.'

b. Un de nos agents, conseiller ou assistant, va vous recevoir.

'One of our agents, counselor or assistant, is going to receive you'.

c. \*Un de nos agents, Paul ou assistant, va vous recevoir.

'One of our agents, Paul or counselor, is going to receive you.'

2) a. Paul et Jean coupent parfaitement la viande.

'Paul and Jean perfectly cut the meat.'

b. Ce couteau et ces ciseaux coupent parfaitement la viande.

'This knife and those scissors perfectly cut the meat.'

c. \*Paul et ce couteau coupent parfaitement la viande.

'Paul and this knife perfectly cut the meat.'

# Coordination (2)

- **Syntactic condition:** conjuncts must independently meet the syntactic requirements of some shared and unique context (Sag *et al.* 1985; Zaenen & Karttunen 1984, Pullum & Zwicky 1986)

1) a. Il semble / Il peut / \*Il se peut y avoir quelques nuages.

It seems / It may / It SE-may  $_{VP_{inf}}$ [Y-have-INF some clouds]

'It seems / may be the case that there are some clouds.'

b. Il semble / \*Il peut / Il se peut qu'il pleuve par endroits.

It seems / It may / It SE-may  $_s$ [that it rain-SUBJ by places]

'It seems / may be the case that it rains in some places.'

c. Il semble / \*Il peut / \*Il se peut y avoir quelques nuages et qu'il pleuve par endroits.

It seems /It may /It SE-may  $_{VP_{inf}}$ [Y-have-INF some clouds] and  $_s$ [that it rain-SUBJ by places]

2) a. La directrice a l'air suspect.

The director-FEM has  $_{NP}$ [the look-MASC suspect-MASC]

'The director has a suspect mine'

b. La directrice a l'air inquiète.

The director-FEM  $_v$ [has-the look-MASC]  $_{AP}$ [worried-FEM]

'The director looks worried.'

c. \*La directrice a l'air suspect et inquiète.

The director-FEM has the look-MASC suspect-MASC and worried-FEM

'The director has a suspect mine and looks worried.'

# Combining both theories

- If indicative and subjunctive involve two different head predicates in negative context, then mixing both moods in coordinate structures should be excluded, as independently argued by Huot (1986)
- Informal collection of judgements on H. Huot's examples with 'penser", and similar ones with 'douter' unconclusive:
  - 1) a. Je ne pense pas que Jean soit<sub>-SUBJ</sub> convaincant, ni qu'il dit<sub>-IND</sub> la vérité.  
b. Je ne pense pas que Jean est<sub>-IND</sub> convaincant, ni qu'il dise<sub>-SUBJ</sub> la vérité.  
'I don't think that Jean is convincing, nor that he's telling the truth.'
  - 2) a. Je ne doute pas que Jean soit<sub>-SUBJ</sub> convaincant, ni qu'il dit<sub>-IND</sub> la vérité.  
b. Je ne doute pas que Jean est<sub>-IND</sub> convaincant, ni qu'il dise<sub>-SUBJ</sub> la vérité.  
'I don't doubt that Jean is convincing, nor that he's telling the truth.'
- A relevant case for finer-grained empirical investigations

## **II. CORPUS DATA**



# Method

- Automatic extraction of sentences including " ni que|qu' " in the free access FrWac corpus (54 875 342 sentences; 1,3 million words, Baroni *et al.* 2009): **2145 matches (1,3 / million)**
- Manual elimination of noise:
  - First pass
    - Interrogative / restrictive 'que'
    - Coordination of unlike categories (S+NP, S+PP, *etc.*)
    - Atypical ni-conjuncts (root clauses, unbalanced uses of ni...ni, downstairs licensing negation in the first conjunct)
  - Second pass
    - Non-standard and informal uses (mostly from blogs)
    - Obvious excerpts from literature or religious texts reflecting older stages of French
    - Sourceless narrative examples
  - Third pass
    - Undecidable examples, involving one or more neutral verb forms
    - Identical tokens (e.g. legal mentions)
- Working corpus of 488 occurrences, annotated for:
  - Mood (S / I / I+S / S+I)
  - Type of head predicate according to Gross (1975)'s data base and self-intuition (PS, e.g. 'croire' (to believe) / PI, e.g. 'douter' (to doubt) / RS, e.g. 'vouloir' (to want) / RI, e.g. 'réaliser' (to realize) / Mixed, e.g. 'garantir' ('to warrant'))

# Results (1): overview

	PS pred. ( <i>'croire'</i> )	PI pred. ( <i>'nier'</i> )	Mixed pred. ( <i>'garantir'</i> )	RS pred. ( <i>'vouloir'</i> )	RI pred. ( <i>'réaliser'</i> )
SUBJ	130 (39,03%)	9 (47,36%)	26 (28,88%)	34	0
IND	174 (52,25%)	8 (42,1%)	52 (57,77%)	0	12
SUBJ+IND	8 (2,4%)	0	9 (10%)	0	0
IND+SUBJ	21 (6,3%)	2 (10,52%)	3 (3,33%)	0	0
Total	333	19	90	34	12

- Expected distribution of the two moods
- Overall preference for indicative, even in PS environments (vs. acceptability judgements, see Amsili & Guida 2014)
- Coordinations with mood mismatch attested in both orders, but clearly marginal

# Results (2): some examples

1) a. Il n'est pas certain que la personne que vous visez soit<sub>SUBJ</sub> disponible ni qu'elle va<sub>IND</sub> accepter d'emblée le sujet qui vous intéresse.

'It is not certain that the person you try to reach will be available, nor that she will accept without discussion the project you're interested in'

b. Je ne crois pas que nous avons<sub>IND</sub> fait du bolchévisme sous le gouvernement Jospin ni que ce soit<sub>SUBJ</sub> l'extrême gauche au pouvoir dans les 20 régions que nous dirigeons.

'I don't think that we behaved as "bolchevics" under Jospin's government, nor that the extreme Left is in charge in the 20 regions under our authority'

2) En réalité, jamais économiste ne s' est aventuré à nier que la guerre et la conquête furent<sub>IND</sub> de la plus haute importance dans le passé, ni que les Huns et Tartares, les Vandales et Vikings, les Normands et les conquistadores aient<sub>SUBJ</sub> joué un rôle énorme dans l' Histoire.

'In fact, no economist ever tried to deny that wars and conquests were of extreme importance in the past, nor that the Huns and Tartares, the Vandales and Vikings, or the Normands and Conquistadores played a huge part in History.'

3) Le concédant ne garantit pas que le logiciel<sub>SUBJ</sub> soit conforme à vos besoins, ni qu' il fonctionnera<sub>IND</sub> correctement dans n' importe quel environnement informatique.

'The licensor does not warrant that the software will meet your requirements, nor that it will function properly in any computer environment.'

- Parallelism, scalar, or cause-effect discourse relation between conjuncts
- Preference for indicative in first position
- Preference for verb forms with a futurate (or conditional) interpretation in the indicative complement clause (20 ex. out of 43)
- Lexical typing to be investigated

# **III. EXPERIMENTAL DATA**

# Method

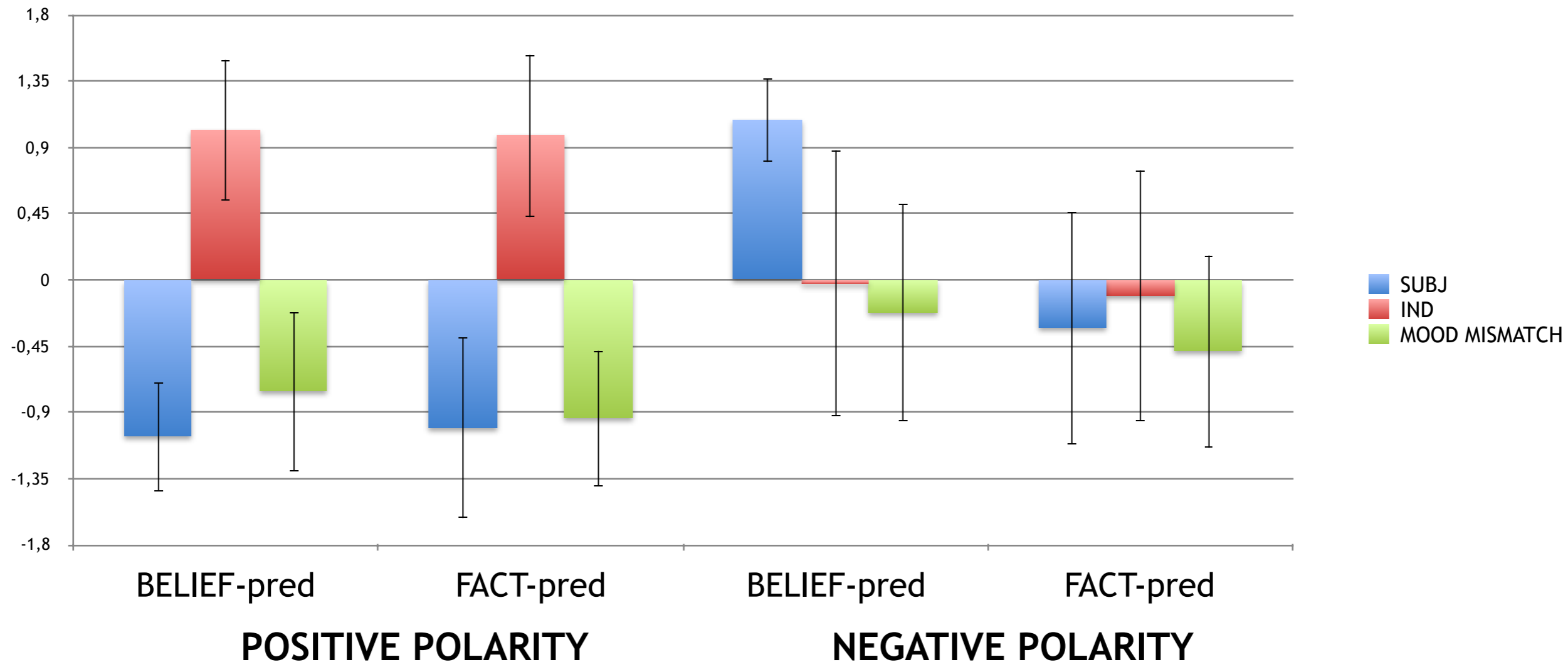
- Experiment on acceptability judgements conducted at two different times on a group of 16 native French speakers aged from 25 to 65, education level  $\geq$  *Baccalauréat* +3
- Corpus of 2048 sentences, obtained by crossing:
  - 16 matrix coordinations (including H. Huot's one)
  - 16 predicates (4 predicates of belief+ 4 intrinsically negative predicates + 4 factive predicates + 4 predicates of will) cf. Godard *et al.* 2013
  - 2 polarities (negative => *ni*-coord / positive => *et*-coord)
  - 4 mood patterns (IND / SUBJ / IND+SUBJ / SUBJ+IND)
- Latin-square distribution in 2 x 16 questionnaires, each questionnaire including 16 target sentences randomized with 32 fillers to be rated on a 1-10 scale (not natural at all/completely natural)
- 2 questionnaires/participant to be completed in a 48-h interval
- 32 conditions; 16 observations (1/judge) / condition

# Reliability estimation

- Same 32 filler sentences for every participant in both questionnaires to measure agreement of judgements across raters and time
- Intra-class correlation coefficient as a *ratio* obtained by comparing the variability of ratings by different participants or one participant at 2 different times with the total variation:
  - ICC coefficient  $> 0,75$ : excellent agreement
  - $0,5 < \text{ICC coefficient} < 0,75$ : medium agreement
  - ICC coefficient  $< 0,5$  : weak agreement
- Interjudge reliability (mean ICC coef.):  $0,55 \pm 0,007$
- Intrajudge reliability (mean ICC coef.):  $0,77 \pm 0,09$

# Results (1): polarity subjunctive

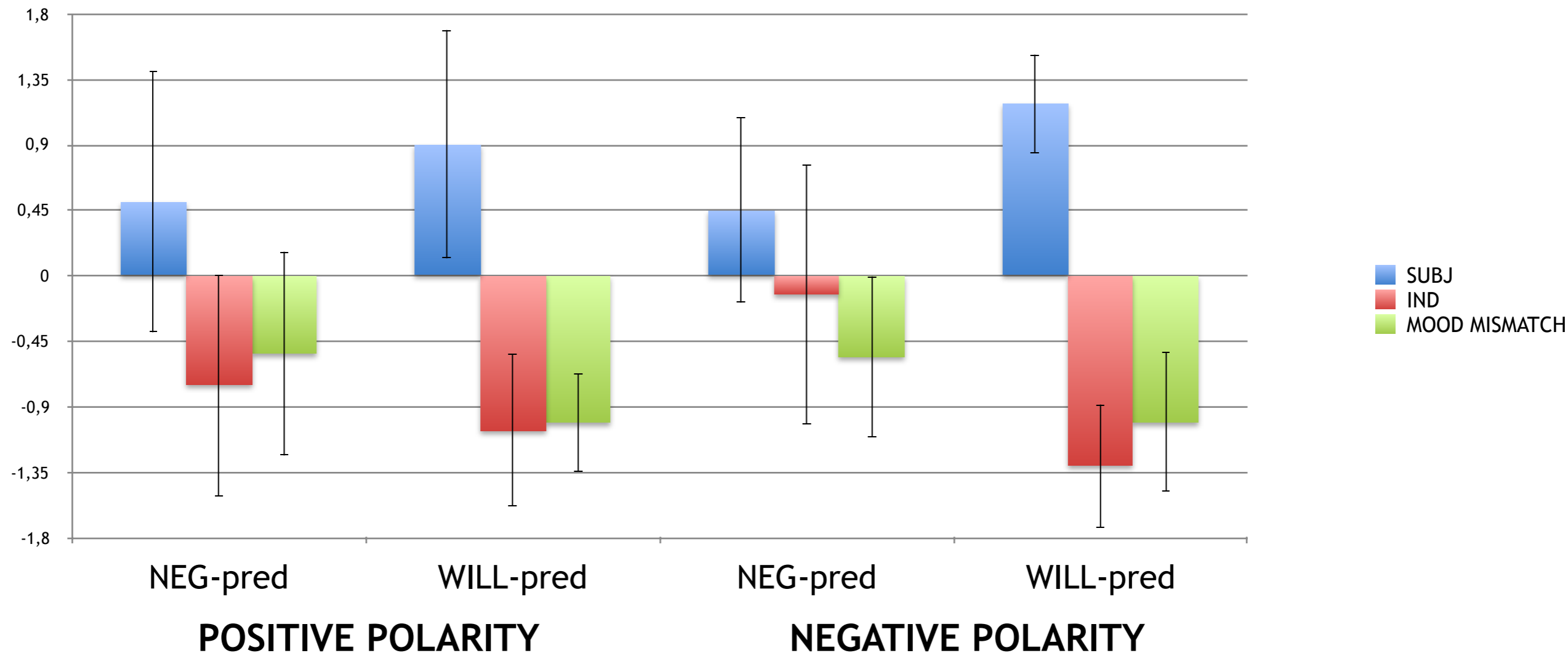
## Z-transformed scores of acceptability



- Expected scoring of coordinations without mood mismatch according to polarity and predicate type (cf. Godard *et al.* 2013, Amsili & Guida 2014 and appendix 3-1)
- Significant negative scoring of coordinations with mood mismatch (see appendix 3-2 for details)

# Results (2): polarity indicative

## Z-transformed scores of acceptability

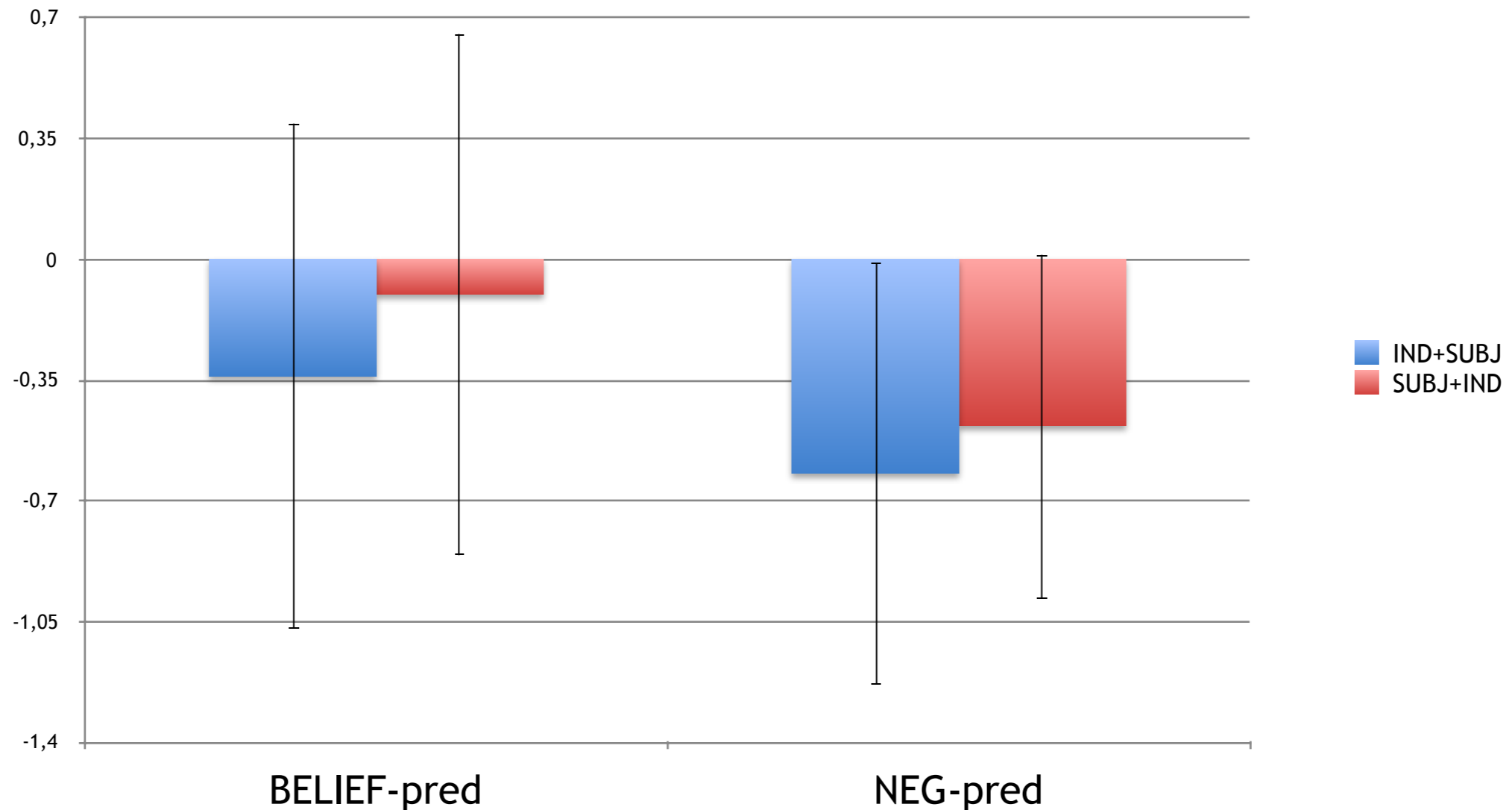


- Less clear effect of negation: no strong reversed mood licensing with PI predicates, subjunctive remaining preferred over indicative (but scores difference not significant, see appendix 3.1)
- Significant negative scoring of coordinations with mood mismatch (see appendix 3.2 for details)



# Results (3): mood order (dis)preferences in negative context

Z-transformed scores of acceptability



- Slightly improved acceptability with subjunctive first, i.e. the mood preferred when there is no mismatch
- Scores difference not significant

# Discussion

- Experiment to be improved:
  - Few participants
  - Same tested predicates in both questionnaires (but matrix coordinations different)
  - Doubtful *ni*-licensing under negated factive verbs
  - Coordinations with mood mismatch involving a futurate/conditional interpretation in the indicative clause not tested
  - Debatable statistical measures: to be replaced by linear mixed-effects models analyses ?

# To conclude

- Polarity mood phenomenon driven by the interplay of negation, semantic/pragmatic conditions on subjunctive and indicative and lexical semantics
- Polarity subjunctive more robust than polarity indicative
- Coordination with mood mismatch judged unnatural, as predicted by Godard & de Mulder's theory
- Attested examples as confusions between two systems, to be compared with other similar phenomena of competition:
  - (1)a. J'ai laissé<sub>1</sub> faire la vaisselle à mon fils.  
I have let<sub>1</sub> do-INF the dishes to my son
  - b. J'ai laissé<sub>2</sub> ma fille plier le linge.  
I have let<sub>2</sub> my daughter fold-INF the laundry
  - c. ?J'ai laissé faire la vaisselle à mon fils et ma fille plier le linge.  
I have let do-INF the dishes to my son and my daughter fold-INF the laundry

# Acknowledgements

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Thank you for your attention

# Appendix 1: conditions on the use of subjunctive and indicative in complement clauses (Godard 2012)

$\alpha$ ) Indicative mood motivated "if the combination of the head and complement clauses is such that when the tenses allow for an overlap of the two situations (...) the embedded clause expresses a proposition to the truth of which an agent is committed »

$\beta$ ) Subjunctive mood motivated "when the speaker takes into account the fact that there may exist an agent who believes that *non-p* is possible"

## Principle of distribution in French

- Complement clause in the subjunctive if condition ( $\beta$ ) is met (and possibly ( $\alpha$ ) too, cf. *regretter que Psubj*)
- Complement clause in the indicative if condition ( $\alpha$ ) is met, and not ( $\beta$ )

# Appendix 2 – Experiment material

- Predicates:
  - Pred. of belief (PS): croire (to believe), supposer (to suppose), être persuadé (to be persuaded), être évident (to be obvious)
  - Intrinsically negative pred. (PI): douter (to doubt), être contestable (to be disputable), disconvenir (to deny), avoir DET doute (to have DET doubts)
  - Factive pred. (RI): se rendre compte, réaliser, mesurer, voir (to realize)
  - Pred. of will (RS): vouloir (to want), désirer, souhaiter, avoir envie (to wish)

# Appendix 2 – Experiment material (2)

## • Matrix coordinations:

- 1) Tout est réglé, et l'avenir est assuré.  
'Everything is settled, and the future is assured.'
- 2) La route est glissante, et le trafic est perturbé.  
'The road is slippery, and the trafic is disturbed.'
- 3) Jean est convaincant, et il dit la vérité.  
'Jean is convincing, and he is telling the truth.'
- 4) Le traitement est court, et il est indolore.  
'The treatment is short, and it is painless.'
- 5) L'affaire est résolue, et la vie reprend son cours normal.  
'The case is closed, and life can restart.'
- 6) La croissance reprend, et les actionnaires sont rassurés  
'Economic growth is recovering, and shareholders are reassured.'
- 7) Les routes sont dégagées, et la météo est favorable.  
'Roads are clear, and the weather is promising.'
- 8) L'article est publié, et votre nom est cité.  
'The article is published, and your name is cited.'
- 9) Le devoir est facile, et les notes sont excellentes.  
'The exam is easy, and grades are excellent.'

- 10) L'expérience est bien menée, et les conclusions sont convaincantes  
'The experiment is correctly conducted, and conclusions are convincing.'
- 11) La circulation est rétablie, et les magasins sont ouverts.  
'Trafic is restored, and shops are open.'
- 12) L'opération est sans risque, et la convalescence est brève.  
'The surgery is safe, and convalescence is brief.'
- 13) Le dossier est complet, et il est recevable.  
'The file is complete, and it is admissible.'
- 14) Le problème est bien posé, et la démonstration est correcte.  
'The problem is correctly stated, and the demonstration is correct.'
- 15) La consigne est claire, et le sujet est aisé.  
'The instruction is clear, and the subject is easy.'
- 16) L'appartement est lumineux, et il est calme.  
'The apartment is bright, and it is quiet.'



## Appendix 2 – Experiment material (3)

- Set of examples for a given predicate and a given matrix coordination:

- 1) Je crois que Jean est convaincant, et qu'il dit la vérité.
- 2) Je crois que Jean soit convaincant, et qu'il dise la vérité.
- 3) Je crois que Jean est convaincant, et qu'il dise la vérité.
- 4) Je crois que Jean soit convaincant, et qu'il dit la vérité.
- 5) Je ne crois pas que Jean est convaincant, ni qu'il dit la vérité.
- 6) Je ne crois pas que Jean soit convaincant, ni qu'il dise la vérité.
- 7) Je ne crois pas que Jean est convaincant, ni qu'il dise la vérité.
- 8) Je ne crois pas que Jean soit convaincant, ni qu'il dit la vérité.

# Appendix 3 – Statistical analysis (1)

Paired samples of z-scores	Student T-test for paired samples	Wilcoxon sign-ranked test
Subjunctive with PS pred. in positive / negative context	Significant (1 tail : $p=7,41^{-12}$ , 2 tail : $p=1,48^{-12}$ )	Significant (1 tail : $p=0,0002$ , 2 tail : $p=0,0004$ )
Indicative with PI pred. in positive / negative context	Significant (1 tail : $p=0,0003$ , 2 tail : $p=0,0004$ )	Significant (1 tail : $p=0,0006$ , 2 tail : $p=0,001$ )
Subjunctive with PS / RI pred. in negative context	Significant (1 tail : $p=2,57^{-6}$ , 2 tail : $p=5,15^{-6}$ )	Significant (1 tail : $p=0,0003$ , 2 tail : $p=0,0006$ )
Indicative with PI / RS pred. in negative context	Significant (1 tail : $p=1,88^{-5}$ , 2 tail : $p=2,17^{-5}$ )	Significant (1 tail : $p=0,0004$ , 2 tail : $p=0,0009$ )
Indicative / subjunctive with PS pred. in negative context	Significant (1 tail : $p=0,0002$ , 2 tail : $p=0,0004$ )	Significant (1 tail : $p=0,001$ , 2 tail : $p=0,002$ )
Indicative / subjunctive with PI pred in negative context	Not significant (1 tail : $p=0,05$ , 2 tail : $p=0,1$ )	Not significant (1 tail : $p=0,06$ , 2 tail : $p=0,1$ )

# Appendix 3 – Statistical analysis (2)

Paired samples of z-scores	Student T-test for paired samples	Wilcoxon sign-ranked test
Coordinations with / without mood mismatch with PS pred. in negative context	Significant (1 tail : $p=0,002$ , 2 tail : $p=0,004$ )	Significant (1 tail : $p=0,007$ , 2 tail : $p=0,01$ )
Coordinations with / without mood mismatch with PI pred. in negative context	Significant (1 tail : $p=1,24^{-5}$ , 2 tail : $p=2,48^{-5}$ )	Significant (1 tail : $p=0,0003$ , 2 tail : $p=0,0007$ )
Coordinations with mood mismatch with PS / RI pred. in negative context	Not significant (1 tail : $p=0,13$ , 2 tail : $p=0,27$ )	Not significant (1 tail : $p=0,13$ , 2 tail : $p=0,26$ )
Coordinations with mood mismatch with PI / RS pred. in negative context	Significant (1 tail : $p=0,01$ , 2 tail : $p=0,03$ )	Significant / Not significant (1 tail: $p=0,03$ , 2 tail: $p=0,06$ )
Coordinations with mood mismatch with PS pred. in negative / positive context	Significant (1 tail : $p=0,001$ , 2 tail : $p=0,002$ )	Significant (1 tail : $p=0,001$ , 2 tail : $p=0,003$ )
Coordinations with mood mismatch with PI pred. in negative / positive context	Not significant (1 tail : $p=0,44$ , 2 tail : $p=0,8$ )	Not significant (1 tail : $p=0,47$ , 2 tail : $p=0,9$ )
Coordinations with mood mismatch with PS pred. in negative context with indicative / subjunctive first	Not significant (1 tail : $p=0,08$ , 2 tail : $p=0,1$ )	Significant / Not significant (1 tail : $p=0,02$ , 2 tail : $p=0,05$ )
Coordinations with mood mismatch with PI pred. in negative context with indicative / subjunctive first	Not significant (1 tail : $p=0,19$ , 2 tail : $p=0,39$ )	Not significant (1 tail : $p=0,12$ , 2 tail : $p=0,25$ )