Effects of context on the processing of adversative and comparative constructions

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The phenomenon: adversative connectives in comparative constructions

1 a. The Friday exam was difficult, **but** *less difficult* than the Tuesday exam.
1 b. # The Friday exam was difficult, **but** *more difficult* than the Tuesday exam.

In a specific context, both sentences seem plausible, e.g. a teacher trying to construct two equally difficult exams for two groups of students

Relevance Theory *(Blakemore 2002)*

But introduces an utterance that must contradict and eliminate an assumption that was made **accessible** by the preceding utterance along with context.

the assumption is something like "*the Friday exams was difficult (by all standards)*"

- (1a) contradicts this assumption as by comparison the exam was not difficult
- in (1b) this assumption is not contradicted, and no other assumption appears accessible.

The addition of an explicit context makes the additional assumption "*the Friday exam was of the appropriate level of difficulty*" relevant and accessible, and (1b) is expected to be perfectly natural.

Bayesian Argumentation Theory *(Winterstein 2012)*

But marks an **argumentative opposition** between its two conjuncts. There must exist a proposition *H* such that the first conjunct makes *H* more probable and the second one makes it less probable.

- *difficult* and *more difficult* are both lower-bounding expressions and activate similar goals (i.e. the sets of propositions whose probability is raised by the assertion of each conjunct are very similar)
- *difficult* and *less difficult* activate different sets of goals, the opposition can be resolved.

The addition of a context suggests a goal that has the desired qualities, but the *a priori* incompatibility remains.

Experiment - Method

Participants : 44 students from Université Paris Diderot, native speakers of French
Materials: 10 experimental items, 30 fillers

Example item:
Context: Un enseignant | a choisi un problème de maths | assez difficile pour son examen de jeudi. | Vendredi, | il a un autre examen | avec un groupe de même niveau | et veut trouver | un problème de difficulté rigoureusement équivalente.
A teacher picked a fairly difficult exercise for his exam on Thursday. On Friday, he has another exam with another group of the same teaching level. For this, he wants to find an exercise which is exactly as difficult as the other.

Test sentences:
a) Pour son examen de vendredi, | l'enseignant a trouvé | un problème difficile |

mais plus difficile	que celui	qu'il avait choisi	pour son examen de jeudi
Region 1	Region 2	Region 3	Region 4

For his exam on Friday | the teacher has found | an exercise which is difficult | but more difficult | than the one | which he has chosen | for his exam on Thursday.

a) Pour son examen de vendredi, | l'enseignant a trouvé | un problème difficile | mais moins difficile | que celui | qu'il avait choisi | pour son examen de jeudi.
For his exam on Friday | the teacher has found | an exercise which is difficult | but less difficult | than the one | which he has chosen | for his exam on Thursday.

Design: group (context/no context)[1] x condition (more/less)

Procedure
Part 1: phrase-by-phrase self-paced reading (phrases are separated by | above), comprehension question after each sentence
Part 2: acceptability judgments of experimental items on a 9-point scale

[1]between participants

Experiment – Offline Results

Linear mixed effect models with maximal random effect structure were fitted to the data using the lmer package in R with the following syntax:

```
Judgment ~ group*cond +(cond|Subj) + (group*cond|Item)
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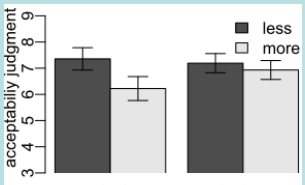
Effects of condition and group were confirmed by likelihood-ratio tests



- no effect of group ($\chi(1) < 1$)
- significant effect of condition ($\chi(1) = 8.14$, $p < .01$)
- significant interaction of group and condition ($\chi(1) = 4.59$, $p < .05$)
- analyses by group:
  - condition is only significant in no-context group

Experiment – Online Results

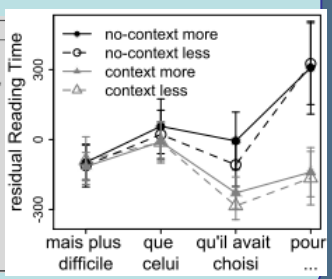
Preprocessing
- calculation of residual reading times after accounting for length and trial number
- removal of all trials with wrong answer to comprehension question (24%)

lmer model syntax (R) :

```
RTresidual ~ group*condition + condition*expTrial
+(condition*expTrial|Subj) + (condition|Item)
```

- significant effect of group in Region 3 & 4
- significant effect of condition in Region 3 ($\chi(1) = 4.00$, $p<.05$)
- no significant interaction of group and condition

	Region 1	Region 2	Region 3	Region 4
(Intercept)	−103.42*	9.17	−159.27***	60.33
	(42.33)	(52.18)	(41.93)	(73.90)
group	−10.11	−14.75	−83.68*	−197.32**
	(37.07)	(35.71)	(39.24)	(63.81)
condition	−0.13	8.25	42.89*	−5.00
	(23.11)	(22.01)	(18.93)	(30.63)
expTrial	6.44	14.89	2.86	0.39
	(7.17)	(8.48)	(8.92)	(11.06)
group:condition	−8.98	−9.58	−7.44	12.53
	(18.10)	(21.63)	(18.58)	(30.65)
condition:expTrial	6.46	−4.89	−10.18	−8.53
	(7.14)	(8.11)	(7.17)	(14.03)



Discussion

Predictions:
- According to Relevance Theory we predicted processing difficulties for *"more difficult"* without context, but not with context
- According to Bayesian Argumentation Theory, we predicted processing difficulties for *"more difficult"* regardless of context

Results:
- For the offline data, we observed an effect of the context: While without context the *more* condition was less acceptable, there was no significant difference between conditions within context
  ⇒This indicates that the context was well constructed to raise the desired expectations
- For the online data, there was an increase of reading time for the *more* condition regardless of whether the sentence occured with or without context

⇒ Our results are compatible with Bayesian Argumentation Theory but not with Relevance Theory

References

Blakemore D. (2002) Relevance and Linguistic Meaning. The Semantics and Pragmatics of Discourse Markers, Cambridge University Press, Cambridge.
Winterstein G. (2012) "What but-sentences argue for: a modern argumentative analysis of but", Lingua 122 (15).