The Processing Costs of Presupposition Accommodation

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Introduction: The study of the timing of availability of presuppositions (PSPs) in on-line language comprehension is crucial for characterizing PSPs as either a semantic or a pragmatic phenomenon (cf. Schwarz 2015:13): on the one hand, if PSPs are conceived as information conventionally encoded in the lexical meaning constituting a condition for the context update (Heim 1990, Heim & Kratzer 1998), then in processing a presupposing utterance, we should expect delays during the sentence processing, before the asserted content is computed. On the other hand, if PSPs are the result of pragmatic inferences based on the truth-conditional content (Simons 2002), delays should be expected after the asserted content is computed, as with conversational implicatures.

Some preliminary behavioural studies have suggested that the processing times of PSPs vary according to three processing conditions: satisfaction (SAT), accommodation (ACC) and falsification (FAL). Schwarz (2007) has shown that the overall reading times (RTs) for a sentence containing the focus particle *auch* are longer in ACC than in SAT. With a word-by-word paradigm, Tiemann et al. have found that, with different PSP triggers, ACC takes longer than FAL on the trigger region (Tiemann et al. 2011) and that ACC elicits longer processing times than SAT on the critical word *wieder* (Tiemann et al. 2015), suggesting that, at least with this trigger type, ACC as compared to SAT, starts immediately during the sentence processing.

Research Questions: two aspects about the on-line processing times of PSP accommodation are still on the way to be clarified: (i) does ACC compared to SAT elicit longer processing times independently of the PSP trigger in use? Or is this a difference related to specific trigger types? (ii) What is the time-course of presupposition accommodation? Or, in other words, are presuppositions accommodated online during the sentence processing or off-line after the asserted content is computed?

Method & Procedure: Within a self-paced reading times paradigm followed by a true/false task, participants (N: 42; mean age = 25.06) were asked to read 40 stories and answer 3 verification questions after each story. The stories (Table 1) were composed of 2 context sentences followed by 1 target sentence presented word-by-word. Four types of PSP triggers were used: *definite descriptions* (DD, N: 10), *change of state verbs* (CSV, N:10), *iterative expressions* (IT, N:10) and *focus-sensitive particles* (FC, N:10). Items were presented in 2 conditions: satisfaction (SAT), where the presupposed information activated by the trigger in the target sentence was made explicit in context sentence 1, and a neutral condition (NEU) where it was not and prompted accommodation. The verification questions were 2 distractors and 1 target question verifying the content of the presupposition. We collected participants' RTs on the word-by-word target sentence. We identified the following main regions of interest (Table 2): (i) for all the trigger types, the triggering point (T1); (ii) for CSV, IT and FC, the computational point (T2), where the content of the PSP becomes fully available.

Results: The high percentage of correct answer to the verification questions in the NEU condition (i.e. 74.89%) suggests that participants have mostly accommodated the presuppositions. RTs data revealed (i) significantly longer reading times for NEU than SAT on

T1 and T1+1 ($p<0.05$ in both regions) for all the PSP triggers; and (ii) a significant interaction ConditionXTrigger Type in T1+1 ($p< 0.005$) and in T2 ($p< 0.05$). Post-hoc comparisons revealed that the longest reading times were elicited in NEU with DDs in T1+1 (DD vs. CSV: $p< 0.05$; DD vs. FC: $p<0.005$; DD vs IT: $p<0.05$) and with ITs in T2 (IT vs. CSV: $p<0.05$; IT vs. FC: $p<0.05$).

Discussion: Data collected suggest that, independently of the PSP trigger in use: (i) ACC takes longer than SAT, reflecting the cognitive cost associated with a process of context repair; (ii) presuppositions seem to be processed online given that accommodation takes place immediately and proceeds incrementally while the sentence unfolds (i.e. effects on T1, T1+1 and T2); and (iii) different triggers differently affect the cognitive load of processing presuppositions: DDs and ITs are more cognitively demanding than other triggers at different phases of sentence processing. Overall, by extending the preliminary existing results, this study provides evidence for the on-line processing of presuppositions and supports the predictions of the semantic accounts of PSPs according to which PSPs are accommodated before the asserted content is computed.

Condition	Context sentence 1	Context sentence 2	Target sentence	Verification questions	
SAT	Before her pregnancy Gaia smoked ten cigarettes per day	The possible fetal diseases scare her a lot	From the very beginning she has *given up smoking* but her worries remained the same	*Target*	Was Gaia used to smoke?
				Distractor	Does Gaia have three kids?
NEU	Gaia is at the third month of her first pregnancy			*Distractor*	Is Gaia peaceful about her pregnancy?

Table 1. Example of an item with CSV in condition SAT and ACC. Literal translation from Italian

Trigger	Word number														
	1	2	3	4	5 (T1)	6	7 (T2)	8	9	10	11	12	13	14	15
DD	Un	mese	fa	il	grafico	ha	presentato	le	dimissioni	per	problemi	con	il	suo	capo
	One month ago, the designer has submitted his resignation due to problems with his boss														
IT	Marco	ha	dimenticato	di	nuovo	le	chiavi	e	purtroppo	è	rimasto	chiuso	fuori	dall'	ufficio
	Mark has forgotten again the keys and unfortunately he is remained closed out the office														
FC	Da	giovane	è	stato	anche	in	Australia	dove	ha	incontrato	la	sua	compagna	di	vita
	When he was young he also visited Australia where he met his current partner														
CSV	Fin	da	subito	ha	smesso	di	fumare	ma	le	sue	paure	sono	rimaste	sempre	uguali
	Since the beginning she has given up smoking but her worries remained the same														

Table 2. Example of target sentence for each trigger type presented word-by-word.
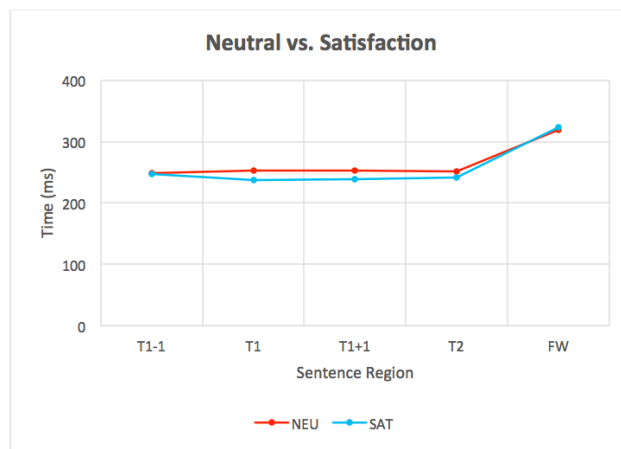

Figure 1. Mean reading times in conditions NEU vs SAT.

References

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