Comparing the processing of two types of durative-to-punctual coercion

Johanna Alstott (MIT) & Athulya Aravind (MIT)

This study concerns two aspectual coercion processes, i.e. processes where an adverbial forces a predicate to take on a non-typical meaning. The first process is inchoative coercion [1-2], in which a stative predicate (*Ben was sad*) gets a change-of-state meaning (*Ben <u>became</u> sad*) when alongside a *(with)in*-modifier (*within an hour, Ben was sad*). The second process is completive coercion [3], in which a durative telic predicate (*Sal climbed Everest*) gets a punctual telic meaning (*Sal <u>summited</u> Everest*) when alongside an *at*-modifier (*Sal climbed Everest at 7pm sharp*). Work on aspectual coercion, including inchoative coercion [2], has shown that coercion has a processing cost [4-7], but no work has looked at the processing of completive coercion. As inchoative and completive coercion both involve durative predicates (*be angry, climb Everest*) getting a punctual meaning (*start to be angry,finish climbing Everest*), we seek to find out if the processing cost found by [2] for inchoative coercion exists for completive coercion.

To address this question, we ran an English self-paced reading study building on [2], aiming to replicate [2]'s findings on inchoative coercion and probe completive coercion in a similar design. On each trial, participants read a short scenario before reading a target sentence word-by-word which–they were told–was supposed to describe what happened in the scenario. Our scenarios were designed to ensure that participants interpreted target sentences like *Sal climbed Everest at 7pm sharp* with completive coercion ("Sal finished climbing Everest at 7pm sharp") rather than with a world knowledge violation ("Sal started and finished climbing Everest at 7pm sharp"). After reading the target sentence, participants rated its naturalness on a 1-5 scale.

We recruited 220 native English speakers for the study, which had two between-subjects conditions (inchoative and completive condition). The conditions had three critical trial types: coercion trials, "no coercion+identical verb" trials, and "no coercion+identical modifier" trials. Coercion trials in the inchoative and completive conditions used target sentences with inchoative and completive coercion, respectively (see (1a) and (2a) in Fig. 1). "No coercion+ identical verb" trials used the same main clause as coercion trials but used a non-coercive modifier (see (1b) and (2b) in Fig. 1). "No coercion+identical modifier" trials used the same modifier as coercion trials but switched to a punctual main predicate that does not induce coercion (see (1c) and (2c) in Fig. 1). Participants saw twelve critical trials and nine fillers.

Participants should know if coercion is required at the verb. Those who read up to *was* in (1a) have seen *within* + stative, so they know inchoative coercion is required. Those who read up to *climbed* in (2a) see *climbed* but know from context that the climbing finished at midnight, so they know completive coercion is required. If coercion has an online cost, we should thus see longer RTs at or just after the verb in coercion trials vis-à-vis one or both non-coercive trial types.

Fig. 2 sums up RTs. To probe the cost of coercion, we fit a series of mixed-effects models predicting logRT from trial type (coercion vs.no coercion+identical verb vs. no coercion+identical modifier; coercion as reference level), among other predictors. We found no effect of coercion at the verb in the completive condition or at either critical region (verb or verb+1) in the inchoative condition. However, completive coercion trials were read more slowly than completive "no coercion+identical modifier" trials at verb+1 ($p = 0.006$). A *post hoc* test showed that completive "no coercion+identical verb" and "no coercion+identical modifier" trials did not differ at verb+1.

Fig. 3 sums up offline naturalness ratings. Like other sentences with coercion [5], completive coercion sentences were a bit less natural than non-coercive completive condition sentences ($p = 0.005$, pooling no coercion+identical verb and no coercion+identical modifier). Ratings for coercive and non-coercive inchoative condition sentences did not significantly differ ($p = 0.319$).

We found a processing cost for completive coercion, indicating a similar psychological status as other coercions. However, we found no processing cost for inchoative coercion, unlike [2]. Future research should find out if this difference from [2] stems from differences in our designs (our use of *be*-statives rather than psych-verbs, our contexts). But if (1a) does lack a processing cost, we need a theory that sets (1a) apart from other coercions (e.g. [8]'s non-coercive theory).

Fig. 1: Sample stimuli for each condition.
(1) Context: Kendall lost his wallet during a trip out of town, so he went to the bank to cancel his credit card. When Kendall went into the bank, the teller bombarded him with tedious questions and took a long time to input Kendall's answers. After about 50 minutes without real progress, Kendall started yelling at the teller about how the process should be faster.
(a) Within an hour Kendall was angry at the teller.
(b) Quite understandably Kendall was angry at the teller.
(c) Within an hour Kendall became angry at the teller.

(2) Context: Jackson is a daredevil who specializes in climbing really high mountains in record time, usually in under a day. Jackson started ascending his highest mountain yet, Mount Rainier, at the crack of dawn, aiming to reach the summit by midnight that night. It was a very difficult climb, but Jackson met his goal without a second to spare.
(a) At midnight sharp Jackson climbed the menacing mountain.
(b) Very impressively Jackson climbed the menacing mountain.
(c) At midnight sharp Jackson finished the difficult climb.

Fig. 2: Mean logRTs. Error bars are SEM. LogRTs were more normal than raw RTs.

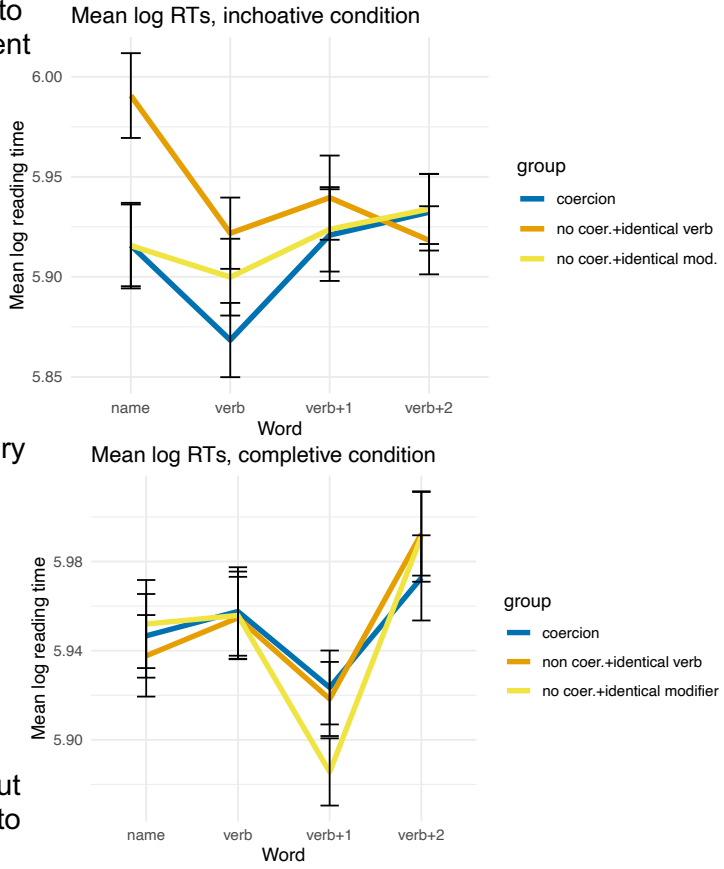
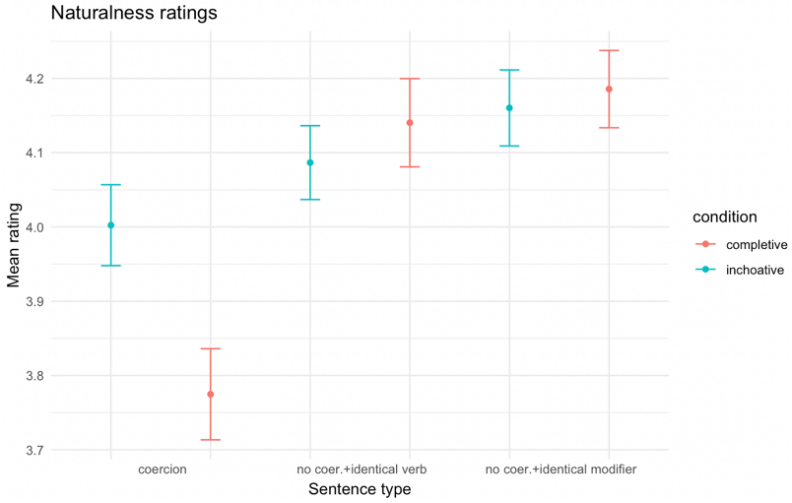


Fig. 3: Mean naturalness ratings



References

[1] Dölling. 2014. Aspectual coercion and eventuality structure. In *Aspects, phases, and arguments: Topics in the semantics of verbs.* **[2]** Brennan & Pylkkänen. 2010. Processing psych verbs. *Language and Cognitive Processes*. **[3]** Rett, Jessica. 2020. Eliminating EARLIEST: A general semantics for *before* and *after*. Proceedings of *Sinn und Bedeutung*. **[4]** Piñango, Zurif, Jackendoff. 1999. Real-time processing implications of aspectual coercion at the syntax-semantics interface. *J Psycholinguist. Research.* **[5]** Todorova, Straub, Badecker, Frank. 2000. Aspectual coercion and online computation of sentential aspect. Proceedings of *CogSci*. **[6]** Brennan & Pylkkänen. 2008. Processing events. *Brain and Language*. **[7]** Paczynski, Jackendoff, Kuperberg. 2014. When events change their nature. *J Cognitive Neuroscience*. **[8]** Krifka, Manfred. 2010. *Before* and *after* without coercion. *Natural Language & Linguistic Theory.*