



Relative Clause Processing



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Previous Research

- When **subject** is modified by **Relative Clause (RC)**, there are longer reading times on the following **main verb** (cf. Gibson et al 2000, i.a.).
- Generally assumed explanation (Gibson 2000):** There is an **integration cost** at the verb if a dependency has to be established to **subject** across intervening **RC**.
- However, Santi et al. (2011) show that in production, this effect actually surfaces as a **pause before the verb**.
- Proposed alternative explanation:** The cost is due to computing the restriction of the noun phrase encoded by the RC.

This Study

- Santi et al. (2011) predict that lengthening should also be observed after **RC** which modifies **object**.
- Since there is no integration necessary at this point, such an effect is not predicted by the standard theory (cf. Gibson et al. 2000).
- Instead, the lengthening should be observed at the beginning of **following clause**.

Methods

- The tests were run using subjects from Amazon Mechanical Turk (from the United States), using Self Paced Reading Experiments hosted on a modified version of the IBEX Farm web platform.
- Part of the ARIA project was to develop the software for more efficient and flexible use.
- Each trial was followed by an understanding question, then a naturalness rating.
- Four conditions were run, consisting of Subject-extracted vs Object-extracted relative clauses, and whether the relative clause modifies the subject or the object.
- Residual Reading Times were used, which correct for the reading speed of the participant and the orthographic length of the word.

point after which lengthening (SPR) or pause (production) is expected

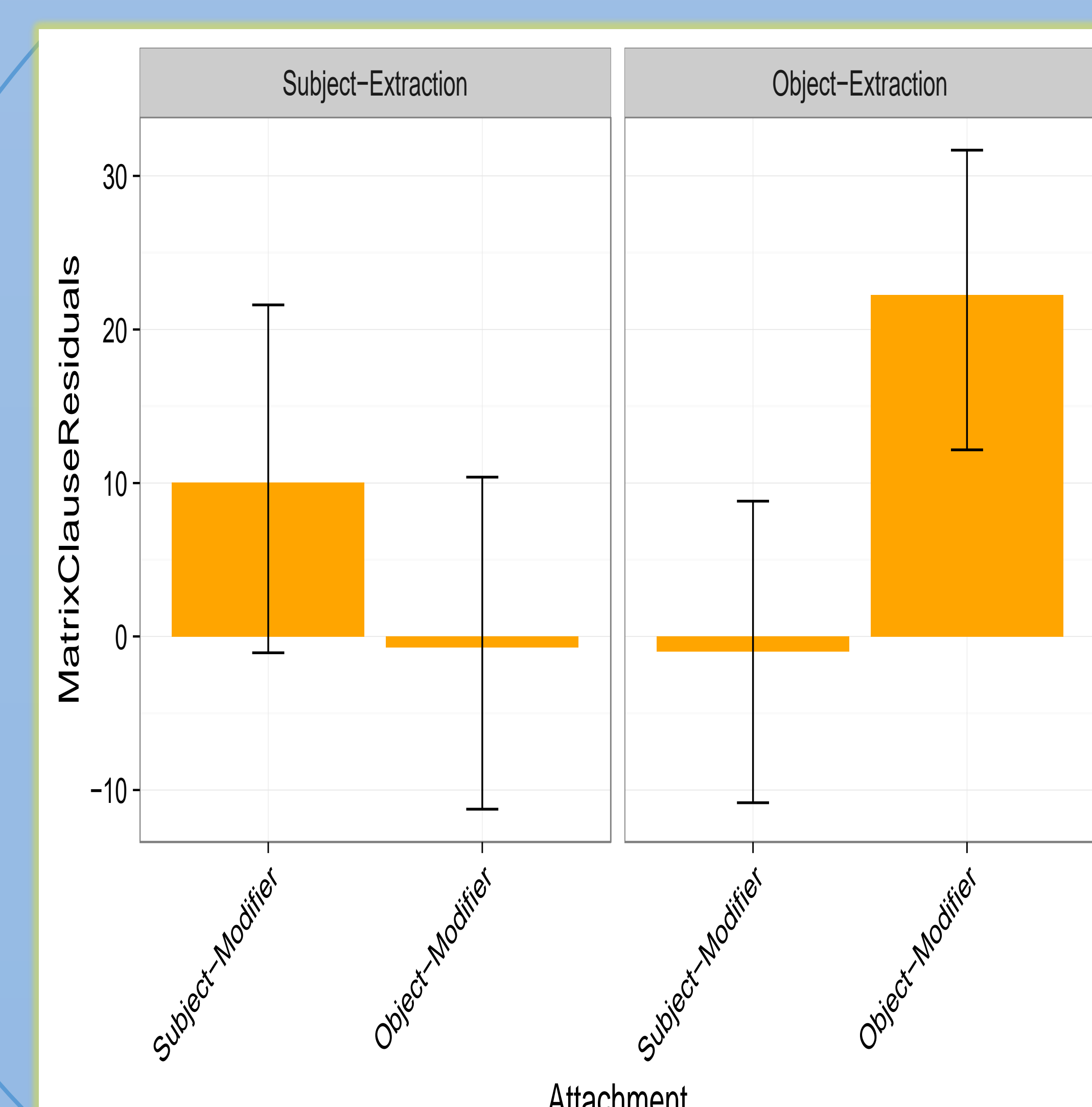
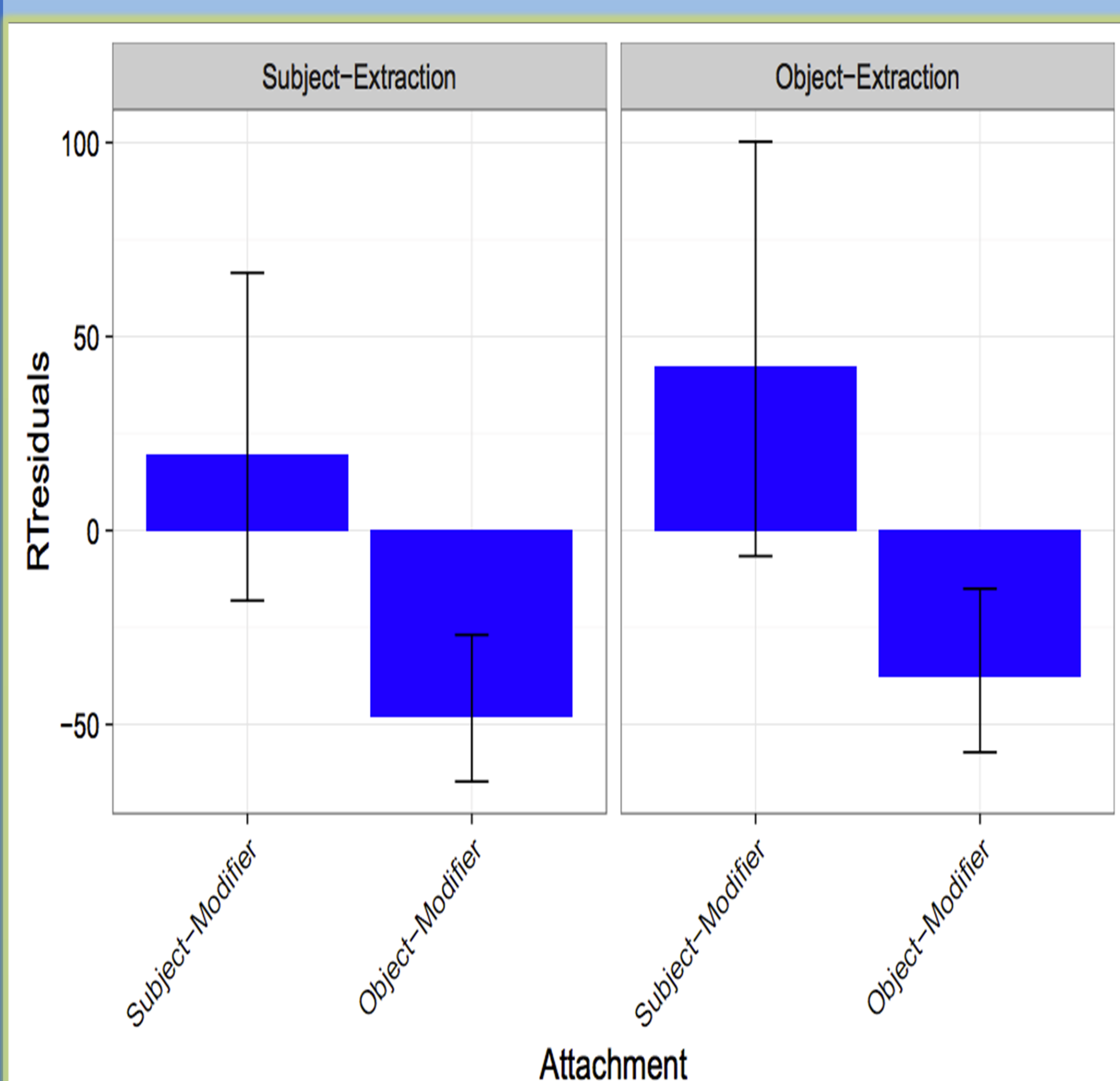
1: While the president ignored the reporter that the senator attacked a press conference was given about the trade deal.

2: While the reporter that the senator attacked ignored the president a press conference was given about the trade deal.

3: While the president ignored the reporter that attacked the senator a press conference was given about the trade deal.

4: While the reporter that attacked the senator ignored the president a press conference was given about the trade deal.

subject Relative Clause verb object following clause



Subject attachment results in a longer reading time on the main verb (replicates earlier results).

The predicted lengthening of the following clause is clearly observable in the case of object extraction.

However, the effect is not seen during subject extraction. In fact, there is a weak trend in the opposite direction.

The extraction site in the RC (subject vs. object) did not affect the length of the verb, i.e., attachment site and extraction site did not interact.

So, there is an interaction which was not predicted by the either the present or by prior hypothesis, meaning more study must be done on this.

References and Acknowledgements

Gibson, E. (2000). The dependency locality theory: A distance based theory of linguistic complexity. In Miyashita, Y., Marantz, A., and O'Neil, W., Eds.: Image, Language, Brain. MIT Press, Cambridge, Ma. 95-126.
 Santi, A., Grillo, N., Wagner, M., and Grodzinsky, Y. (2011). Planned production and self-paced reading of relative clause attachment. Talk presented at ETAP 2, McGill University.
 Stimuli adapted from E. Gibson et al. "Reading Relative Clauses in English". *Cognitive Linguistics* 16-2 (2005): 313-353. Print.
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Verb Effect Data (Residual)

Following Clause Effect (Residual)