The Structure of the Antecedent Matters in the Processing of Ellipsis

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[Introduction] It has been claimed that antecedent structures of ellipsis do not impact the processing of the ellipsis site based on the observation that having a structurally more complex antecedent did not give rise to the slower processing of the ellipsis site [1,2,8,9,10]. We report the result of an eye-tracking study on the processing of sluicing, an ellipsis construction, which revealed that the processing of the ellipsis site was influenced by the structural differences in the antecedent of ellipsis. This indicates that readers do in fact have access to and recover the structural information of the previously processed materials when processing the ellipsis site.

[Background] It is shown that structural complexities of antecedents caused by the manipulation of the length/size of the antecedent clause or the distance between the antecedent and the ellipsis site did not impact the processing time of VP-ellipsis (1) and sluicing (2) [1,2,8,10]. The absence of the antecedent-complexity effect has been interpreted as the parser does not have access to the antecedent structure when the ellipsis site is processed.

(1) a. Sarah left her boyfriend last May. Tina did too.
b. Sarah got up the courage to leave her boyfriend last May. Tina did too.

(2) (In the morning) Michael studied (in the morning), but he didn't tell me what.

Against this background, this study aims to show that the processing of the ellipsis site in sluicing construction is influenced by the structural complexity of the antecedent.

[Experiment] We tested the effect of the antecedent complexity by manipulating the syntactic structure of the antecedent. It has been shown that wh-gap dependencies spanning across an NP as in (3a) creates processing complexity compared to those spanning across a clause as in (3b) [3,6].

(3) a. ... **who** [$_{NP}$ the consultant's denial about that the new proposal] had pleased GAP.
b. ... **who** [$_{Clause}$ the consultant denied that the new proposal had pleased GAP].

Adopting this configuration into the context of sluicing (a sample set of stimuli is summarized in the Table 1), we tested if the reading time of the ellipsis site ('who' in the second conjunct) is affected by the complexity of the antecedent. Overt sentential pronouns are included as baseline as the pronoun-resolution is known to be immune to the structure of antecedent [4,7].

An eye-tracking while reading experiment (n=77) manipulated the wh-locality (a clause-crossing wh-movement: local) vs. a nominal-crossing wh-movement: non-local) and the construction type (sluicing vs. pronoun) as independent factors in a 2x2 within-subjects factorial design (24 item sets and 72 filler items). Sentences were distributed in a pseudo-randomized manner in a Latin-square design.

A linear mixed effects model, including fixed effects of Wh-locality and construction type, and their interactions, as well as random intercepts for participants and items, revealed a main effect of locality observed in the Total Time Duration measure on the wh/pronoun region, such that the non-local conditions were read significantly slower than the local conditions ($\beta = 0.10$, SE=0.03, t=2.71, $p<0.01$) (see Figure 1). An interaction between the wh-locality and construction type was also observed ($\beta = -0.12$, SE=0.05, t=-2.26, $p<0.05$) (see Figure 2). Further subset analysis showed that such that the sluicing/non-local condition was read significantly slower than the sluicing/local condition ($p<0.05$), but there was no effect of locality in the pronoun conditions.

[Conclusion] There are two notable findings. Reading times of the ellipsis site were affected by the structural complexity of the antecedent, but the complexity effect was absent in the pronoun conditions. We conclude that readers indeed had access to the structural information of the antecedent and recovered it when processing the ellipsis site, but not when processing the pronoun. These findings are not compatible with the current processing models under which structural complexities of antecedents do not affect the processing of ellipsis. This leads to the need for a syntactically guided processing model.

	Factor1	Factor2	example
1	local	sluicing	I wonder **who** the consultant denied that the new proposal had pleased, but no one knows who, in fact, nobody cares.
2	non-local	pronoun	I wonder **who** the consultant's denial about that the new proposal had pleased, but no one knows who, in fact, nobody cares.
3	local	sluicing	I know **who** the consultant claimed that the new proposal had pleased, but no one knows about it, in fact, nobody cares.
4	non-local	pronoun	I know **who** the consultant's claim about the new proposal had pleased, but no one knows about it, in fact, nobody cares.

Table1. A sample set of stimuli

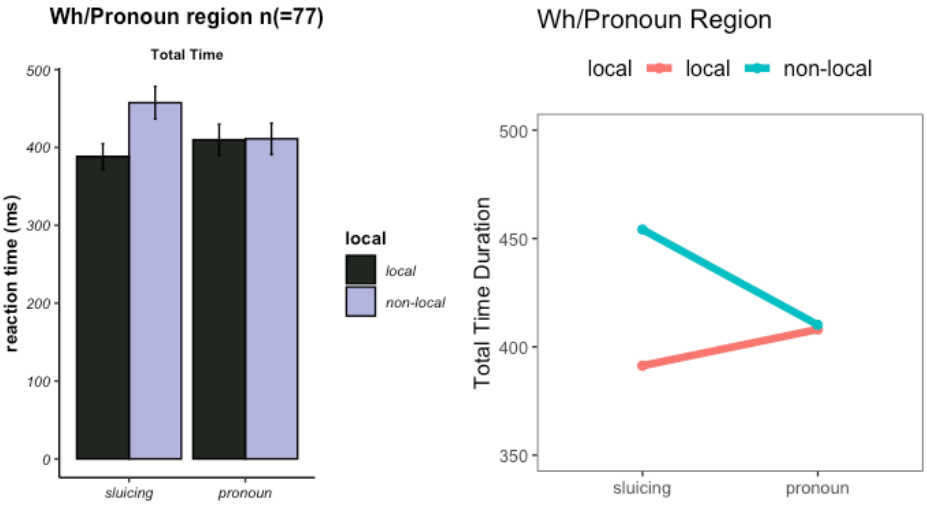

Figure 1 (left) & Figure 2 (right). The Total Time Duration (TTD) at the target region

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