Context rather than semantic priming drives the early availability of focus alternatives

I. Summary

Successful interpretation of any utterance containing focus requires a comprehender to infer the set of alternatives intended by the speaker [1]. Prior cross-modal forced-choice task studies have endorsed a two-stage model of this process [2, 3, 4]. Under this view, an initial context-insensitive stage of semantic priming provides a second context-sensitive stage with the lexical activation necessary to represent focus alternatives as such.

We present results from a cross-modal probe recognition task experiment challenging this view. We found that alternative status, as modulated by discourse context, influenced the speed of recognition for probe words that were not semantically primed by their focus. We observed this effect immediately after focus was encountered, contrary to the predictions of the two-stage model.

II. Background

Under the two-stage model, identifying alternatives is a *destructive* process. In the first stage, immediately after encountering focus, semantic priming takes place activating a large set of *associates* (i.e., words semantically primed by the focus). In the second stage, a context-sensitive mechanism selects relevant alternatives from among these *associates* and maintains their activation, eventually yielding the appropriate alternative set. In line with this, prior studies found that, after encountering focus, relevant alternatives are only represented following a delay [2, 3, 4].

However, [5] pointed out that none of these studies tested contextually relevant *non-associate* alternatives (i.e., those not semantically primed by their focus). The authors argued that this confound might have obscured the early availability of focus alternatives. They performed a cross-modal probe recognition task experiment with discourses containing a focus (e.g., *violin*) and two relevant alternatives used as probes: one *associate* alternative (e.g., *guitar*) and one *non-associate* alternative (e.g., *pizza*). Contrary to the predictions of the two-stage model, they found that both alternatives were correctly recognized faster than a non-alternative control (e.g., *house*) immediately after the focus was encountered (i.e., 0ms SOA).

[5] took their results to support a *constructive* model in which discourse context alone is utilized to build a representation of the alternative set. Under this view, the early representation of an item as a focus alternative crucially depends upon the surrounding discourse. The present study more directly investigates the potentially context-sensitive nature of this early processing.

III. Method

We modified [5]'s materials (see Table 1) and ran an in-person cross-modal probe recognition task experiment (N=57) in a 2x2 (context x probe word) within-subjects design. In the *two-alt* context, subjects listened to a discourse in which both an *associate* (e.g., *guitar*) and *non-associate* (e.g, *pizza*) were alternatives to a focus (e.g., *violin*). In the *one-alt* context, subjects listened to a discourse in which the *associate* was an alternative, but the *non-associate* was simply mentioned. Immediately after encountering the focus (i.e., 0ms SOA), subjects performed speeded recognition of either the *associate* or the *non-associate* as a written probe.

IV. Results

Given the *one-alt* context, subjects were on average faster to correctly recognize the *associate* probe ($M = 995, SE = 23$) than the *non-associate* probe ($M = 1138, SE = 27$). Given the *two-alt* context, subjects were also on average faster to correctly recognize the *associate* probe ($M = 1038, SE = 23$) than the *non-associate* probe ($M = 1098, SE = 22$). We fit a linear mixed model to the **log-transformed** response times. We observed the predicted interaction ($\beta = 0.03, t = 3.97$). An interaction interpretation is supported by pairwise comparison of the estimated marginal means which indicated that the *non-associate* probe only elicited longer response times in the *one-alt* context, when it was not a relevant focus alternative ($\beta = -0.16, t = -7.12, p < 0.01$).

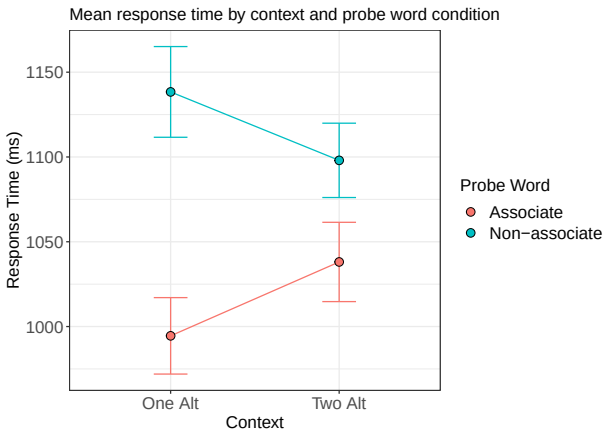

Figure 1: Error bars indicate standard error. Incorrect responses, long responses (>2500ms), and short responses (<200ms) not analyzed.

CONTEXT (AUDIO)	
TWO-ALT:	**ONE-ALT:**
A. Jonah brought the guitar and the pizza to band practice at the new house	**A.** After eating leftover pizza, Jonah brought the guitar to band practice at the new house
B. No, he only brought the [violin]$_F$	
PROBE WORD (VISUAL)	
ASSOCIATE:	**NON-ASSOCIATE:**
GUITAR	PIZZA

Table 1: Example item depiciting context and probe word conditions. The focus alternatives for each context condition occur in a red font.

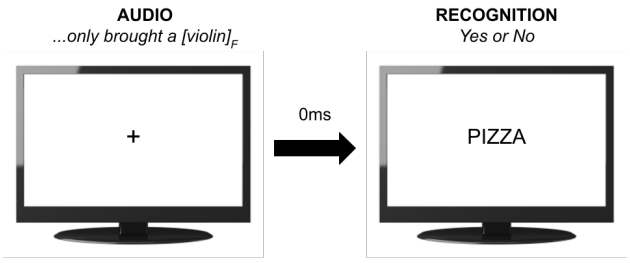

Figure 2: Schema of the cross-modal probe recognition task

V. Discussion

We take the *two-alt* context condition to partially replicate [5]'s findings. As in their study, we found no significant difference in response times between *associate* and *non-associate* probes, as both are contextually relevant alternatives. We take the significant response time penalty observed for the *non-associate* probe in the *one-alt* context to support a *constructive* model of selecting alternatives. Our results suggest that the early availability of alternatives is primarily driven by the discourse context. It is unclear how a *destructive* model dependent upon semantic priming, such as the two-stage model, could capture this early context-sensitive behavior.

[1] Mats Rooth. A theory of focus interpretation. *Natural Language Semantics*, 1992.
[2] Matthew Husband and Fernanda Ferreira. The role of selection in the comprehension of focus alternatives. *Language, Cognition and Neuroscience*, 2016.
[3] Nicole Gotzner, Isabell Wartenburger, and Katharina Spalek. The impact of focus particles on the recognition and rejection of contrastive alternatives. *Language and Cognition*, 2016.
[4] Nicole Gotzner and Katharina Spalek. The life and times of focus alternatives: Tracing the activation of alternatives to a focused constituent in language comprehension. *Language and Linguistics Compass*, 2019.
[5] Author 1 and Author 2. Constructing alternatives: Evidence for the early availability of contextually relevant focus alternatives. In *Alternatives in Grammar*. Palgrave, To Appear.