

# Composition-sensitive predictions: Incremental Processing of Experiential Perfects

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**Background:** Much of the work on memory in sentence processing—whether focused on retrieval, maintenance, or prediction—has emphasized dependencies that are resolved by accessing or anticipating specific lexical items or morpho-syntactic features. These include well-studied phenomena like subject-verb agreement [1], filler-gap dependencies [2, 3, 4], and lexical predictability effects [5, 6, 7], where the relevant information can be directly linked to a stored representation. However, not all grammatical constraints operate over discrete lexical features. Some require the online composition of complex meanings from multiple linguistic elements—meanings that are not recoverable from any single word alone (1). These cases raise important questions about how compositional interpretations are built and maintained during real-time comprehension.

We explore this issue through the lens of *Experiential Perfect* constructions in English, a use of the present perfect aspect often cued by the polarity-sensitive item *ever* (e.g., *John hasn't ever eaten seal*; [8]). These constructions are only felicitous when the verb phrase denotes a repeatable event, i.e. an *event kind* [9, 10, 11]. As seen in (1), *kill flies* is acceptable, while *kill the fly/John* is not, since the latter describes a specific, one-time event. Crucially, repeatability is not a lexical or morpho-syntactic property of either the verb or the object DP alone but emerges as an interaction from the composition of verb semantics and object definiteness: *kill* allows repeatable readings with indefinites but not definites; *see* permits both [12].

- (1) a. Have you ever killed a fly? / b. \*Have you ever killed the fly/John? / c. Have you ever seen John?

Because *ever* can trigger the experiential reading early on, this raises the question of whether comprehenders generate expectations about upcoming verb phrases based on the requirement for repeatable events, and when and how this compositional information is computed during processing. Specifically, we ask whether comprehenders (i) predict the semantic compatibility of upcoming material with the experiential frame, and (ii) compute repeatability incrementally as the verb and object are encountered. This study sheds light on how real-time comprehension integrates compositional semantic constraints with mechanisms of predictive processing.

**Method:** Participants read sentences in a Grammatical-Maze task (n=133). Stimuli followed a 2×2 within-subject design crossing VERB TYPE (Consumption vs. Repeatable) and DETERMINER TYPE (Definite vs. Indefinite), as shown in Table 1. If the repeatability constraint is computed incrementally, definites should be harder to process than indefinites under consumption verbs in unambiguous experiential contexts.

**Results:** As shown in Figures 1 and 2 respectively, we found a significant interaction of VERB TYPE \* DETERMINER TYPE at both the Determiner ( $\beta=0.04$ ,  $p=.01$ ) and the spillover noun ( $\beta=0.05$ ,  $p<.01$ ). While reading times were generally longer for Definites than Indefinites—likely due to definite DPs being unsupported out of context in this study—this effect was crucially larger under Consumption verbs than Repeatable verbs as predicted.

**Discussion:** These results suggest that comprehenders maintain and integrate abstract semantic constraints—like event repeatability—during incremental processing. Such constraints are not computed via retrieval of lexical or morpho-syntactic features alone, but must be evaluated against verb phrase semantics, supporting models that allow for composition-sensitive prediction in comprehension. Ongoing work tests experientials over longer distances, via perceptual reports (2), and ties these results to semantic processing models [13].

V-Type	D-Type	Example
Consumption	Def	Maria knew that Sam hasn't ever eaten the cookie although he wanted to
Consumption	Ind	Maria knew that Sam hasn't ever eaten a cookie although he wanted to
Repeatable	Def	Maria knew that Sam hasn't ever touched the cookie although he wanted to
Repeatable	Ind	Maria knew that Sam hasn't ever touched a cookie although he wanted to

Table 1: Experimental design and example stimuli

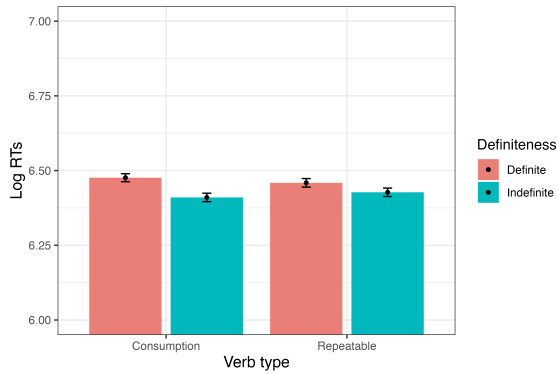


Figure 1: Log RTs at the determiner (*the/a*); Error bars indicate standard errors.

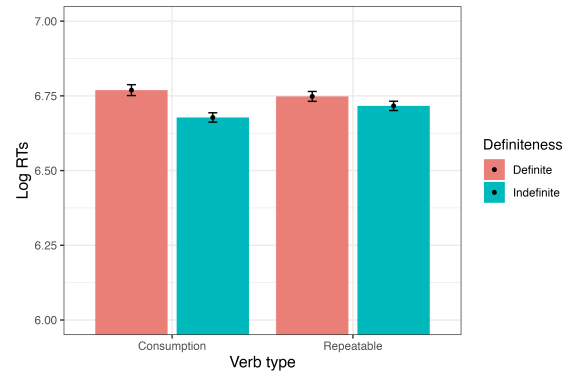


Figure 2: Log RTs at the noun (e.g. *cookie*); Error bars indicate standard errors.

- (2) Mary hasn't ever seen Sam watch John kill a fly / \*the fly/ \*Bill.  
 (Note: when combined with direct perception of an event, experientials only allow perception of a repeatable event [14], the ungrammatical example can only be rescued in a situation involving e.g. a video recording of the event of Sam killing the fly / Bill).

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