

## Composition-sensitive predictions: Incremental Processing of (Long Distance) Experientials

**Background:** Much of the work in sentence processing has emphasized anticipating (and/or retrieving) 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/Max* is not, since the latter describes a specific, one-time event. 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]. Importantly, this restriction also holds across clausal boundaries: when combined with direct perception of an event, an experiential in the matrix clause only allows perception of a repeatable event in the embedded clause (2).

- (1) a. Have you ever killed a fly?/b. \*Have you ever killed the fly/Max?/c. Have you ever seen Max?  
(2) Mary hasn't ever seen Sam kill a fly /\*the fly/\*Max

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 and (iii) whether this prediction survives sentential boundaries. This study sheds light on how real-time comprehension integrates compositional semantic constraints with mechanisms of predictive processing.

**Method Exp 1 & 2:** Participants read sentences in a Grammatical-Maze task (n=133, Experiment 1; n=54 Experiment 2). 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. Experiment 2 used the same design but increased the structural distance between the experiential and the dependent VP by embedding the event within a direct perception report, as in Table 2.

**Results:** Log-transformed reading times revealed a consistent Verb Type \* Determiner interaction across both experiments. At determiners, definites were read more slowly than indefinites, but this effect was reliably larger following consumption verbs (Exp 1:  $\beta=0.04$ ,  $p=.01$ ; Exp 2:  $\beta=0.09$ ,  $p<.001$ ). This interaction persisted at spillover regions (Exp 1:  $\beta=0.05$ ,  $p<.001$ ; Exp 2:  $\beta=0.061$ ,  $p<.019$ ) with Exp 2 also showing a significant main effect of Definiteness at the noun ( $\beta=0.04$ ,  $p=.046$ ), modulated by the same interaction pattern.

**Discussion:** Comprehenders maintain and integrate abstract semantic constraints—like event repeatability—during incremental processing, even across clausal boundaries. These results demonstrate that such constraints are not computed via prediction/retrieval of discrete lexical features alone, but require composition-

sensitive evaluation of verb phrase semantics. This suggests that theories of incremental semantic processing need to incorporate mechanisms for rich semantic composition.

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: Experiment 1: Design and example stimuli

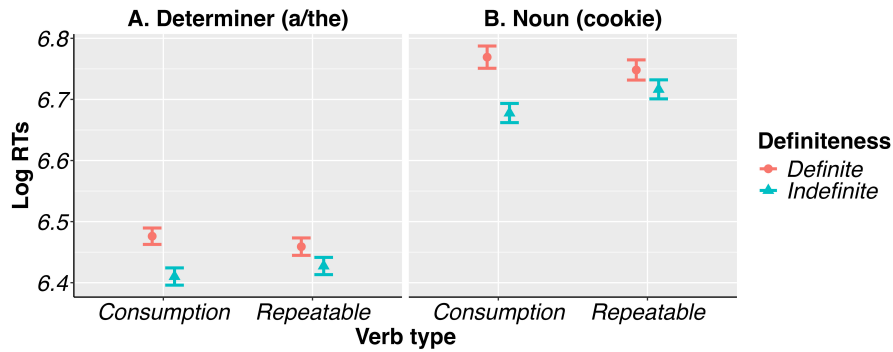


Figure 1: Exp 1 - Log RTs at A. the determiner (a/the) and B. the noun (e.g., cookie). Error bars indicate standard errors of the mean.

V-Type	D-Type	Example
Consumption	Def	Maria hasn't ever seen Sam eat the cookie although he wanted to
Consumption	Ind	Maria hasn't ever seen Sam eat a cookie although he wanted to
Repeatable	Def	Maria hasn't ever seen Sam touch the cookie although he wanted to
Repeatable	Ind	Maria hasn't ever seen Sam touch a cookie although he wanted to

Table 2: Experiment 2: Design and example stimuli

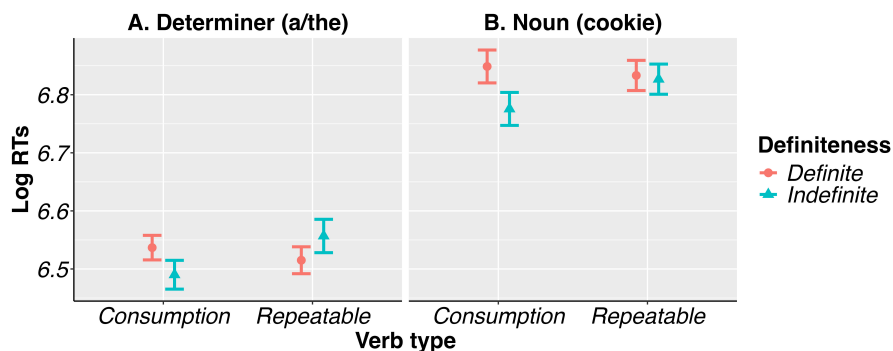


Figure 2: Exp 2 - Log RTs at A. the determiner (a/the) and B. the noun (e.g., cookie). Error bars indicate standard errors of the mean.

[1] Wagers, Lau, & Phillips. (2009). *JML*, 61. [2] Lewis & Vasishth. (2005). *Cognitive Science*, 29. [3] Wagers & Phillips. (2009). *J.of Ling.*, 45. [4] Ness & Meltzer-Asscher. (2017). *JPR*, 46. [5] Altmann & Kamide. (1999). *Cognition*, 73. [6] Lau, Holcomb, & Kuperberg. (2013). *J.C.Neuro.*, 25. [7] Pickering & Gambi. (2018). *Psych. bulletin*, 144. [8] Comrie, B. (1976). *CUP*. [9] Inoue, K. (1975). U. of Michigan. [10] Dahl, O. (1985). *Blackwell*. [11] Gehrke. (2019). In Truswell (Ed.), *Oxford handbook event structure*. OUP. [12] Grillo, Gil, Marsden, Radkevic, Sloggett, Tsoulas, Yeo. (2022). *HSP* 35.