

Not all nothings are represented alike: Evidence from cross-constructural null complementizer priming in English

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Whether speakers represent phonologically silent structures is a high-stakes issue dividing major approaches in (psycho-)linguistics (see Culicover & Jackendoff, 2005; Wagers & Phillips, 2011; Momma et al., 2025). Against this background, we investigated whether speakers represent the null complementizer (\emptyset , as in *The girl believes \emptyset the boy likes the dog*) using structural priming (Bock, 1986; Levelt & Kelter, 1981, a.o.), the tendency of speakers to reuse the structure they encountered. We specifically tested the hypothesis that speakers encode \emptyset in full relative clauses (RCs) without an overt complementizer (e.g., *the evidence \emptyset the lawyer examined*), but not in reduced RCs (e.g., *the evidence examined by the lawyer*), even though both constructions lack the phonological form associated with the complementizer structure.

Previous studies show that speakers are less likely to produce *that* when primed with sentences containing \emptyset (Ferreira, 2003), indicating that speakers can be primed for \emptyset . This \emptyset -priming also occurs across constructions (Momma et al., 2025): \emptyset in an RC (e.g., *The teacher appreciated the thought \emptyset the student expressed*) primes \emptyset in a complement clause (e.g., *The girl believes \emptyset the boy likes the dog*). Crucially, this effect is not merely the priming of the absence of *that*: RCs lacking *that* prime \emptyset relative to a monoclausal baseline that also lacks *that* (e.g., *The teacher appreciated the thought of the student*). Building on these findings, we tested the hypothesis that speakers represent \emptyset in full RCs but not in reduced RCs, which are independently argued to lack the complementizer layer entirely despite being embedded clauses.

English monolinguals ($n = 80$) read aloud and memorized a target and a prime sentence, then produced one of them when cued by a word array corresponding to one of the two sentences (Fig. 1). In critical trials (24 trials), the cue always corresponded to the first (target) sentence; in filler trials (24 trials), it sometimes corresponded to the second sentence so participants could not predict which sentence to recall. All target sentences contained complement clauses (e.g., *The director announced {that/ \emptyset } the actor would be in the new movie*) and included *that* in 50% of critical trials (Target Type; Fig. 2). Each target was paired with a prime sentence varying across conditions (Table 1). Only biclausal responses that could have contained *that* were analyzed. Whether speakers produced *that* (1) or not (0) was coded and analyzed using Bayesian mixed-effects logistic regression with Prime Type (Neutral vs. Reduced RC vs. Object RC), Target Type (*that* vs. *null*), and their interaction as fixed effects, and maximally specified random effects (Barr et al., 2013). Prime Type was Helmert-coded (Neutral vs. Reduced RC, and the average of Neutral + Reduced RC vs. Object RC). Target Type was sum-coded ($-0.5 = \textit{that}$, $+0.5 = \textit{null}$).

Results (Fig. 2) revealed clear evidence that object RCs primed \emptyset in complement clauses. Speakers were about 8% less likely to use *that* following object RC primes than following the other two prime types ($b = -0.55$, $SE = 0.16$, 95% CrI = $[-0.87, -0.23]$). In comparison, speakers were, if anything, 0.2% more likely to use *that* following reduced RC primes than neutral primes ($b = 0.10$, $SE = 0.19$, 95% CrI = $[-0.27, 0.47]$). To assess whether reduced RC primes and neutral primes differed, we also computed Bayes Factors in favor of the null hypothesis under various priors (Schad et al., 2021; Fig. 3), which overall provided support for the null hypothesis across a range of priors for the relevant beta parameter ($BF_{01} = 2.94, 4.78, 8.93, \text{ and } 17.62$ under $N(0, 0.5)$, $N(0, 1)$, $N(0, 2)$, and $N(0, 4)$, respectively). These findings are best explained if (a) \emptyset is represented as a phonologically null but cognitively active structure shared across constructions (full RCs and complement clauses), and (b) reduced RCs lack the complementizer layer and hence lack \emptyset , as independently argued in some analyses (e.g., Harwood, 2018; cf. Chomsky, 1965). **In sum**, the current study suggests that speakers syntactically encode \emptyset in full RCs but not in reduced RCs. More broadly, it suggests that abstract syntactic structures are causally implicated in production and that structural priming can probe fine-grained functional structure in speakers' mental representations of clauses.

Prime	Prime Type
<i>The contract about the new product was invalid.</i>	Neutral
<i>The contract signed by the executive was invalid.</i>	Reduced RC
<i>The contract the executive signed was invalid.</i>	Object RC

Tab. 1. Example prime sentences used in each experiment. Target sentences were like *the director announced (that) the actor would be in the new movie.*

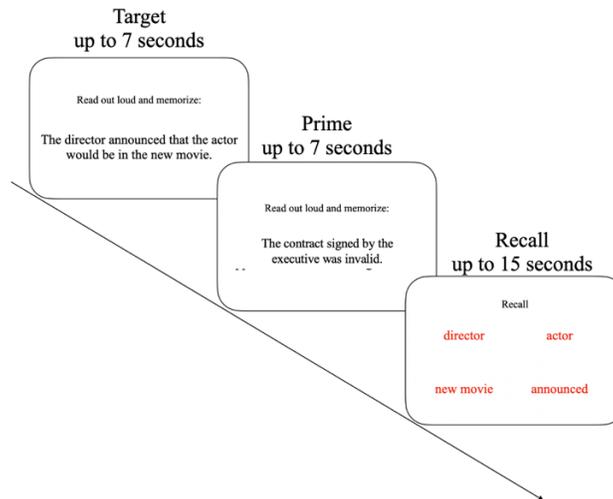


Fig. 1. A schematic illustration of the task.

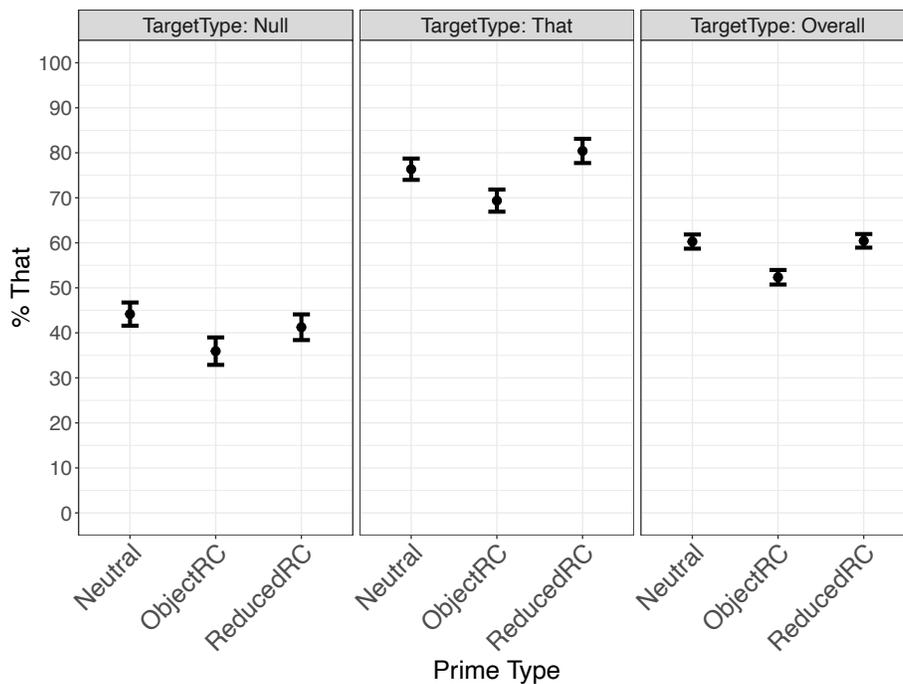


Fig. 2. Mean proportion of *that* production across conditions. The error bars represent standard errors. The left, middle, and right panels show data from conditions where (i) target sentences contained *that*, (ii) target sentences did not contain *that*, and (iii) the grand average, respectively.