As we process language incrementally, we tend to make predictions about future words based on contextual clues. Next-word prediction has been studied extensively in language comprehension, not only to see if prediction facilitates reading but also to see if it helps language users maintain performance in a noisy environment (Futrell et al., 2020). When we plan our speech, we're also contending with noisy and uncertain environments (Gussow, 2023; Gussow & MacDonald, 2023). The present research investigates whether speakers use unspoken, adjunct visual information to make predictions that aid future lexical retrieval in uncertain environments.

We designed a novel typed sentence production paradigm where English-speaking participants are asked to describe simple scenes involving a figure grabbing an object on a table, where that object is occluded by a black box with a space for a cue next to it. In this paradigm, we manipulate at what point in people's production we resolve the uncertainty and reveal the occluded target. 36 critical 2x3 item pairs were constructed, with each item pair consisting of two target nouns each with an associated thematic cue (e.g. soap-loofah, dog-leash). Trials are manipulated to contain an *absent* semantic cue (e.g. just soap or dog), *related* semantic cue (soap-loofah) or unrelated semantic cue (soap-leash); each participant sees every target noun, manipulated between cue relatedness. We ran three experiments, the first experiment (n = 48) where uncertainty was resolved after participants type the verb, the second experiment (n = 71) where uncertainty was revealed after the subject noun, and the final experiment (n = 64) where no black box is present, to simulate a certain environment. Participants underwent an extensive familiarization stage seeing all related pairs, and typing in all target items. In the first experiment, we predicted that participants would speed up in the presence of a related cue, as a result of a successful prediction compared to no cue, whereas they would slow down in the presence of an unrelated cue as a result of having to discard an unhelpful prediction compared to when no cue is present. We predicted this effect would disappear in the second and third experiment because uncertainty is resolved early enough that a semantic cue is not necessary to resolve the noun on time.

In Experiment 1, our manipulation was successful in facilitating typed production in the presence of a related cue. When uncertainty is revealed after typing the verb, participants tend to begin typing the target noun after having typed the verb significantly faster ($p < .001$) when a related semantic cue is present. However, there is no difference producing the target with an unrelated or absent cue. In experiments 2 and 3, our predictions are played out, when uncertainty is resolved earlier or not present at all, participants were unaffected by cue-relatedness, and either fail to attend to the semantic cues or whatever effect the semantic cues have is distributed throughout production and therefore undetectable.

This research offers additional evidence that people use semantic information to support their production in uncertain environments. However the lack of an inhibitory effect in the case of an unrelated cue makes it difficult for us to determine whether this effect is drawn from prediction or simply from thematic priming at the lexical retrieval from a cue. This coincides with other contemporary research that implicates the role of context in facilitatory effects of production (Oppenheim & Nozari, 2024), however this runs counter to other production research that shows a clear detriment to a mistaken prediction (Bannon et al., 2024). Future research should explore the role of categorically related distractors, and include more dynamic stimuli for more naturalistic results.

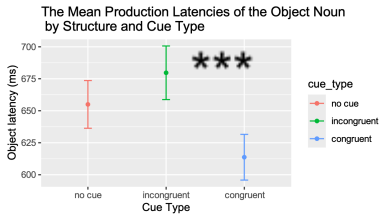


Figure 1: Target noun retrieval in Experiment 1

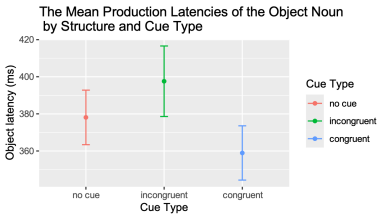


Figure 2: Target noun retrieval in Experiment 2

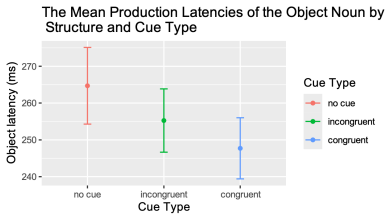
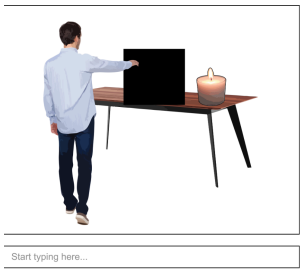
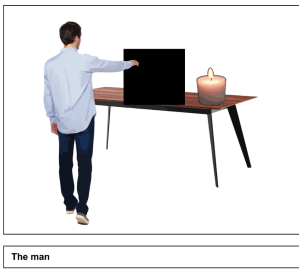


Figure 3: Target noun retrieval in Experiment 3



1. An image with the target obscured is presented to the participant.



2. The participant beings describing the scene in the text box.

3. Once the experimental software detects the verb, the target will be revealed.

4. The participant completes the sentence.

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