

Context is King (and Queen*): The effect of gender information on spontaneous speech over time

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Historically the functionality of grammatical gender (noun class) has been called into question. Yet predictive / information theoretic perspectives predict an obvious function for noun class: nouns are the least predictable part of speech, and marking articles for gender makes the nouns associated with them more predictable (just as prenominal adjectives seem to provide similar information in languages without noun class, e.g. English, Dye et al., 2018). In a written paradigm, Hoppe et al. (2025) showed that when English and German speakers produced noun phrases in context (German has three noun classes), German speakers used fewer colour adjectives than English speakers if articles helped predict nouns in context (but not if they didn't). Spyromilio et al (2025) extended this paradigm to speech: German speaking participants were presented with four coloured objects that moved around the screen and asked to describe their movements (so that they could later be reproduced). Either the target object had the same noun class as the other three objects (uninformative condition) or it had a unique noun class (informative condition; Figure 1). Across two counterbalanced informative and uninformative trials, Spyromilio et al found that participants consistently produced colour adjectives regardless of context, however planned articulatory analyses revealed an interaction resulting from the informativity of the context and repeated mentions of the target item: in informative contexts, speakers enhanced, producing longer, more acoustically informative noun phrases at second mention than at first mention; in uninformative contexts, speakers reduced, showing the opposite pattern.

To expand on these findings, we examined how production was affected by repeated exposure to context by adding two further trials to the original experiment, so that participants were now exposed to two Informative and two Uninformative contexts (either in a **IUIU** or **UIUI** sequence, see Figure 1). In contrast to previous findings, second mention effects were not clearly seen across the four trials. Rather, patterns of effects similar to those observed by Spyromilio et al were now seen at the trial level, with analyses showing that production was affected both by informativity of the context and its place in the trial sequence. For example, as seen in Figure 2, the intensity of productions in informative contexts *decreased* in the later trials, but *increased* in the uninformative contexts. This interaction between context, information and trial sequence was significant at all levels of analysis (duration, intensity and zip file size) for both the phrases and the determiners (whose informativity was manipulated). Finally, analysis revealed that testing sequence also affected production: i.e., whether participants started in an uninformative or informative condition. When added to the findings of Spyromilio et al (2025), these results indicate that speakers are indeed sensitive to the information provided by gender in context, and that their behavior in response to this information changes both at the level of repeated mentions within context, and across repeated exposure to context types.

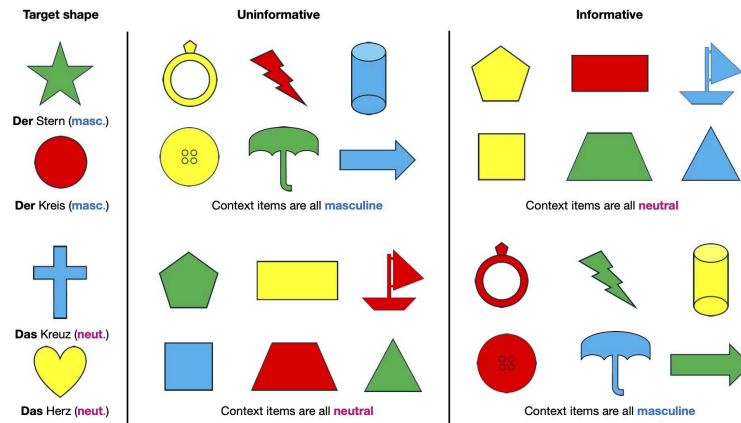


Figure 1. The different conditions participants encountered in the experiment. Participants either encountered the target items in the UIIU or UIUI order. In the informative condition (right), the target noun has a distinct noun class. In the uninformative condition (left) all nouns share the same noun class. The objects start outside the reference frame (a cloud (fem.) shape) and successively moved into it and around it, so that participants were required to mention each target object at least twice.

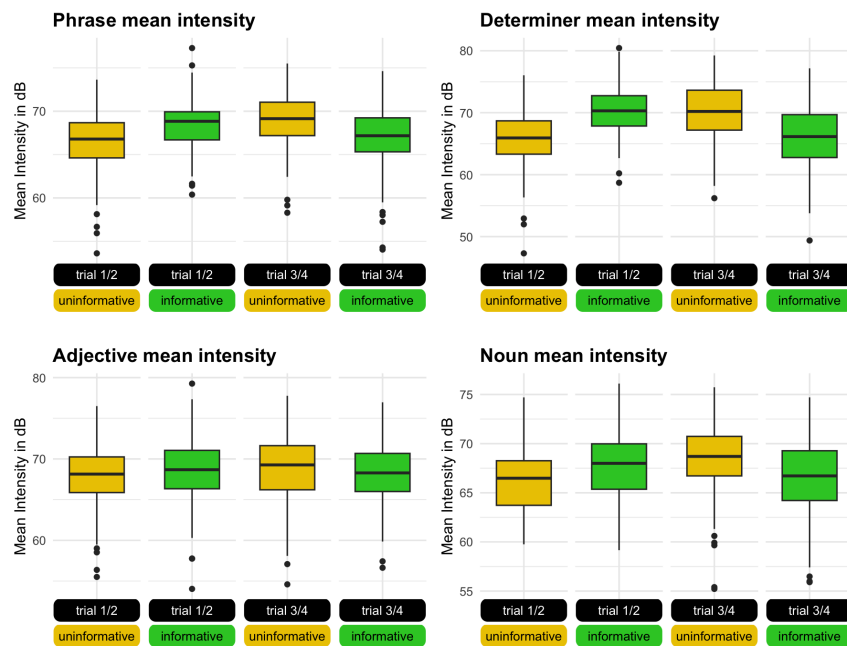


Figure 2. Phrase and determiner intensities of identical article-adjective-noun phrases across repeated contexts (counterbalanced informative and uninformative): as can be seen regardless of the starting context, intensity in informative contexts *decreased* across trials, whereas it *increased* in the uninformative contexts. All interactions are significant except adjectives (where $p=0.08$).

References

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