

Effects of familiarity, number of features and distinctiveness on spoken word production: evidence from German

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In spoken word production, different types of information are activated in the mental lexicon at different stages of processing. In picture naming, visual processing is followed by the retrieval of conceptual information at the semantic level, before specific entries are activated at the lexical level. Activation and selection processes at each level are known to be influenced by item-inherent characteristics of the concept/word (e.g. [1]). Processes at the lexical level have been intensively studied (e.g. [2]) whereas the influence of semantic factors has been examined less and is less clear (e.g. [3]). The present study is the first to investigate the influence of three main semantic variables (familiarity, number of semantic features (NOF) and distinctiveness) in a picture naming task in a large group of German neurotypical speakers. Prior to the picture naming study, we conducted a norming study with 480 participants to obtain semantic norm data for the 215 concepts used in the picture naming task, following the method used in McRae et al. [4] for English norm data. 118 participants (83 female, age range = 19-59; Mean = 35.1; SD = 13.6) took part in the spoken picture naming task. They were asked to name 215 colored pictures as fast and accurately as possible. Using mixed effect models, we examined the influence of familiarity, NOF and distinctiveness on naming latencies and accuracy while controlling for lexical variables. For naming latencies, higher familiarity ($p < 0.005$) and higher NOF ($p < 0.01$) lead to significantly faster reaction times. In addition, facilitatory effects on naming accuracy were found for NOF ($p < 0.005$). Distinctiveness had no significant effect on naming latencies or accuracy. The effect of NOF replicates previous results on English ([3]) and is likely to result from stronger conceptual activation at the semantic level leading to faster and more accurate selection of the target word at the lexical level. More familiar items are likewise associated with higher activity at the semantic level, explaining the faster naming latencies. The lack of any effect of distinctiveness may be due to different factors: On the one hand, there is mixed prior evidence regarding the direction of effects of distinctiveness, suggesting that it can be both facilitatory (due to less competition by other lexical items) and inhibitory (maybe due to less spreading activation at the semantic level, compare [3]). On the other hand, distinctiveness is challenging to operationalize, because it is determined relative to other items of the same data set, and therefore is highly dependent on the composition of the dataset. In sum, our study confirms important roles of familiarity and NOF for word production, and suggests that more research is needed regarding effects of distinctiveness.

References

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