**Experience-driven meaning affects lexical choices during language production**

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The role of meaning facets based on sensorimotor experiences is well-investigated in comprehension, but has thus far received little attention in language production research. Here we investigated in two experiments whether experiential traces of space influence lexical choices when participants completed visually presented sentence fragments (e.g., 'You are at the sea and you see a ...') with freely chosen spoken nouns (e.g., 'dolphin', 'palm tree'). Taking a novel approach by combining Latent Semantic Analysis and extensive ratings we investigated which factors shape the content of verbal messages which is a hitherto neglected aspect of language production research.

In the first experiment 33 participants completed 90 German sentence fragments. The second experiment was preregistered with a sample size of 72 participants completing 60 sentence fragments based on simulations using effect size estimates after preliminary analyses of experiment 1 (https://osf.io/se6a3/?view_only=f666716d3b8f47228017b9dadc6e2950).

In both experiments, the words were presented one after the other in an ascending or descending direction, starting from the center of the screen. All sentences were incomplete and participants had to produce a suitable noun phrase in order to complete the sentence. The noun phrases were rated by a different set of participants with regard to their spatial characteristics, and subjects were asked to indicate on a Likert-scale where they typically encounter the referents of the nouns ranging from the lower to the upper sphere.

We used linear mixed models with presentation direction and spatial properties of the presented sentences as fixed effects and by-subject and by-item random intercepts and slopes to assess the effect of our manipulation on the spatial characteristics of the produced nouns. The physical spatial cues of the sentence presentation direction during the experiment did not influence lexical choices. However, the produced nouns met the spatial characteristics of the broader sentence contexts such that the typical spatial locations of the referents of the produced nouns were predicted by the location of the situations described by the sentence fragments (i. e., upper or lower sphere), see figure 1.

By incorporating semantic similarity measures derived from Latent Semantic Analysis, we show that the meaning dimension of 'location in space' guides lexical selection during speaking even when the similarity between the noun in the presented sentence and the produced noun is small, see figure 2. We therefore conclude that the effect is not entirely due to traditionally investigated categorical, thematic and associative semantic relations but instead due to experientially grounded spatial features. We discuss the relation of this spatial meaning dimension to accounts of experientially grounded meaning and to traditionally investigated semantic measures known to influence lexical-semantic processing in language production, contributing to a more comprehensive understanding of the many facets of meaning processing during language production and their impact on the words we select to express verbal messages.

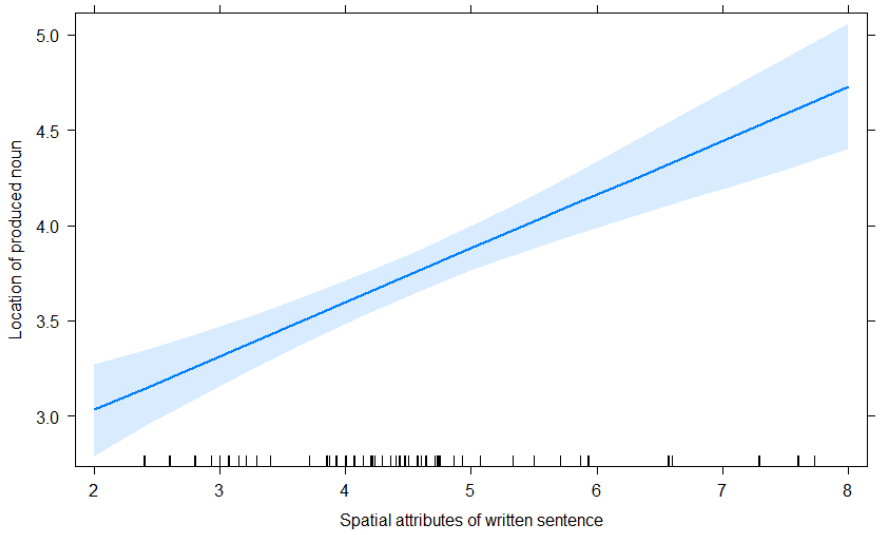


*Figure 1.* Effect plot illustrating that the higher up in the world the situation described by the sentence fragment is perceived the higher up the referents of the produced nouns are located. Spatial locations of the entities referred to with the produced nouns were rated on a scale ranging from 1 (down) to 7 (up) after the experiment. Spatial locations of nouns in the sentence were rated on a scale ranging from 1 (down) to 9 (up) before the experiment. Small ticks above the x-axis mark the distribution of the set of sentences with regard to their spatial properties.

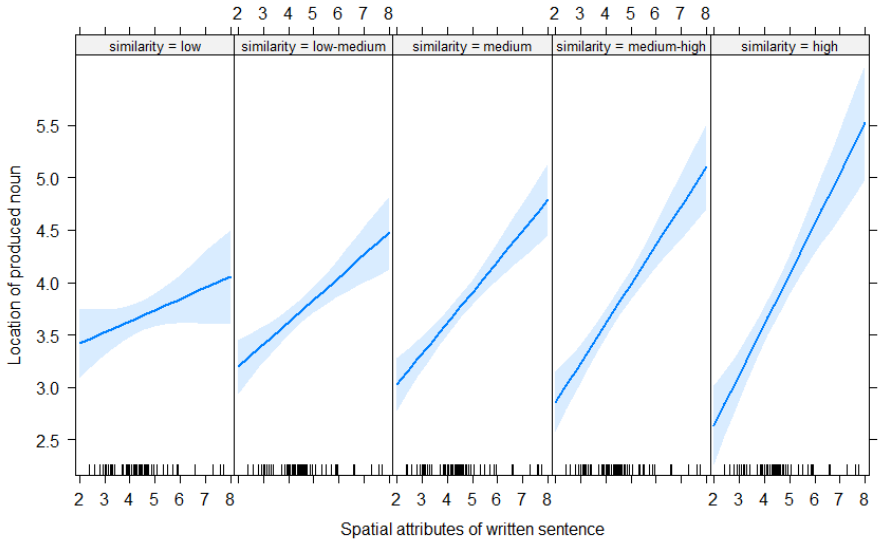


*Figure 2.* Effect plot showing that for increasing degrees of semantic similarity from low to high between the noun in the presented sentence and the produced noun the influence of the spatial attributes of the presented sentences on the spatial characteristics of the produced nouns was more pronounced. Higher values for location of the produced noun as well as for spatial attributes of the written sentences indicate a higher localization in space.