

Does emotion matter less in dense conceptual networks?

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Background: It is well established that concrete concepts and word meanings are anchored in the sensory and motor representations of the corresponding referents. Abstract concepts and meanings of abstract words cannot be anchored this way; even if they have some sensory or motor correlates, these are not likely to represent their core meanings. Kousta et al. [1] proposed that abstract words are anchored in the affective processing and representation: they showed that words with lower levels of concreteness receive higher ratings of emotional valence. We present a proposal that derives additional empirical predictions from the representative substitution approach. One assumption is that the representation of all concepts relies in part on the relations to other concepts, but the role of this conceptual network is especially important for abstract concepts. The second assumption is that concrete concepts are partly anchored in sensory and motor representations, while in abstract concepts, this type of anchoring is partly replaced by anchoring to affective processes. One consequence of these two assumptions is that the role of affective anchoring for abstract words should be relatively smaller in people with denser conceptual networks. When people represent more concepts, we could expect them to have a richer set of conceptual connections in their conceptual system, leaving less space for the affective anchoring. On the other hand, smaller conceptual networks, such as in children or people with limited vocabulary, should be associated with stronger affective anchoring in abstract words.

Method: We tested the prediction above by collecting the emotional valence ratings for 2700 words, while also presenting a brief vocabulary task to the participants. In an online survey created using the jsPsych framework, participants ($N=536$, $M_{age}=22.9$, $SD_{age}=4.8$) were asked to rate each word on a 7-point scale as eliciting negative, neutral or positive emotions. The set of words were Czech translation equivalents of a set originally created for a German study [2]. Concreteness ratings were sourced from the Cze-Lex database of psycholinguistic word properties (in preparation). We split the total set in 17 lists of about 175 words and constructed the lists so that 17 randomly chosen words appeared in all of them, making it possible to calibrate between the lists. The vocabulary task was a multiple-choice task asking about the meaning of 25 unusual words and providing 5 possible responses for each. Each participant was assigned a vocabulary score based on their success rate in this part of the experiment. The task showed good internal consistency in previous unpublished studies (Cronbach's $\alpha > 0.85$).

Results: The results were analyzed using cumulative link mixed models (R package *ordinal*), with concreteness and vocabulary scores as fixed predictors and random intercepts for word and participant. The analysis revealed a robust main effect of concreteness, ($z=-14.89$, $p<0.001$), confirming that abstract words tend to have stronger affective anchoring. In addition, there was a significant interaction of concreteness and vocabulary ($z=2.45$, $p=0.01$), see Figure 1. While the distribution of valence ratings was similar for words with high concreteness across people with high and low vocabulary scores, people with low vocabulary scores show greater likelihood of high absolute ratings of valence in words with low concreteness (Figure 2).

Discussion: The results indicate that the affective anchoring of abstract words is stronger for people with limited vocabularies, presumably because they have sparser conceptual networks. This may have implications for communicating abstract meanings to different types of audiences.

Abs_valency			
Predictors	Odds Ratios	z-score	p
Concreteness	0.71	-14.89	<0.001
Vocabulary	0.96	-0.71	0.479
Concreteness × Vocabulary	1.02	2.45	0.014
Thresholds			
0 1	0.30	-20.68	<0.001
1 2	2.37	14.97	<0.001
2 3	17.80	49.01	<0.001
Random Effects			
σ^2	3.29		
τ_{00} word	1.51		
τ_{00} subj	1.03		
ICC	0.44		
N word	2291		
N subj	407		
Observations	71391		
Marginal R^2 / Conditional R^2	0.029 / 0.452		

Figure 1: Descriptive statistics for concreteness and vocabulary size effects.

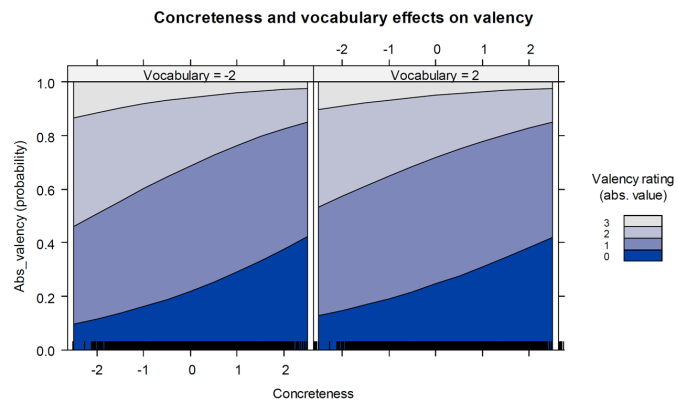


Figure 2: The predicted relations between the participants' vocabulary scores, concreteness of words and the absolute value of their emotional rating. The key difference can be seen in the proportions of the lighter bands (abs. valence ratings 2 and 3).

References

- [1] Kousta, S.-T., Vigliocco, G., Vinson, D., Andrews, M., & Campo, E. D. (2011). The representation of abstract words: Why emotion matters. *Journal of Experimental Psychology: General*, 140(1), 14–34. <https://doi.org/10.1037/a0021446>
- [2] Grandy, T., Lindenberger, U., & Schmiedek, F. (2020). Vampires and nurses are rated differently by younger and older adults—Age-comparative norms of imageability and emotionality for about 2500 German nouns. *Behavior Research Methods*, 52(3), 980–989. <https://doi.org/10.3758/s13428-019-01294-2>