

Sensorimotor norms for 506 Russian nouns

Alex Miklashevsky

Potsdam Embodied Cognition Group (PECoG), University of Potsdam, Germany

Embodied cognitive science suggested a number of variables describing our sensorimotor experience associated with different concepts: modality experience rating (i.e., relationship between words and images of a particular perceptive modality – visual, auditory, haptic etc., see Lynott and Connell, 2009; Lynott and Connell, 2013; Lynott et al., 2019), manipulability (the necessity for an object to interact with human hands in order to perform its function), vertical spatial localization. According to the embodied cognition theory, claiming that our bodily experiences underlie abstract thought (see Kiefer and Pulvermüller, 2012; Meteyard et al., 2012; Fischer and Zwaan, 2008, for reviews; also see Barsalou, 2008), these semantic variables capture our mental representations and thus should influence word learning, processing and production. However, it is not clear how these new variables are related to such traditional variables as imageability, age of acquisition (AoA) and word frequency, known to strongly influence word processing. In the presented database, normative data on the modality (visual, auditory, haptic, olfactory, and gustatory) ratings, vertical spatial localization of the object, manipulability, imageability, age of acquisition, and subjective frequency for 506 Russian nouns are collected. Strongest correlations were observed between olfactory and gustatory modalities (.81), visual modality and imageability (.78), haptic modality and manipulability (.7). Other modalities also significantly correlate with imageability: olfactory (.35), gustatory (.24), and haptic (.67). Factor analysis divided variables into four groups where visual and haptic modality ratings were combined with imageability, manipulability and AoA (the first factor); word length, frequency and AoA formed the second factor; olfactory modality was united with gustatory (the third factor); spatial localization only is included in the fourth factor. Importantly, the database includes semantic categories indicated for each word (e.g., food, transport, mental or emotional concepts), thus making comparisons between categories possible. The database is available online together with a publication describing the method of data collection and data parameters (Miklashevsky, 2018).

References

- Barsalou, L. W. (2008). Grounded cognition. *Annu. Rev. Psychol.*, 59, 617-645.
- Fischer, M. H., & Zwaan, R. A. (2008). Embodied language: A review of the role of the motor system in language comprehension. *The Quarterly Journal of Experimental Psychology*, 61(6), 825-850.
- Kiefer, M., & Pulvermüller, F. (2012). Conceptual representations in mind and brain: theoretical developments, current evidence and future directions. *Cortex*, 48(7), 805-825.
- Lynott, D., & Connell, L. (2009). Modality exclusivity norms for 423 object properties. *Behavior Research Methods*, 41(2), 558-564.
- Lynott, D., & Connell, L. (2013). Modality exclusivity norms for 400 nouns: The relationship between perceptual experience and surface word form. *Behavior Research Methods*, 45(2), 516-526.
- Lynott, D., Connell, L., Brysbaert, M., Brand, J., & Carney, J. (2019). The Lancaster Sensorimotor Norms: multidimensional measures of perceptual and action strength for 40,000 English words. *Behavior Research Methods*, 1-21.

- Meteyard, L., Cuadrado, S. R., Bahrami, B., & Vigliocco, G. (2012). Coming of age: A review of embodiment and the neuroscience of semantics. *Cortex*, 48(7), 788-804.
- Miklashevsky, A. (2018). Perceptual experience norms for 506 Russian nouns: Modality rating, spatial localization, manipulability, imageability and other variables. *Journal of Psycholinguistic Research*, 47(3), 641-661.