Coverage Constraints in Conceptual Property Norms: Comparisons Between Congenitally Blind and Sighted individual reveals differential cognitive processing

Póster

Comportamiento/cognitivo - Behavioral/Cognitive

Rodrigo Lagos [1], Felipe Toro-Hernández [3], Sergio E. Chaigneau [1], Enrique Canessa [1, 2].

(1) Center of Cognitive and Social Neuroscience, School of Psychology, Universidad Adolfo Ibáñez, Santiago, Chile.
(2) Facultad de Ingeniería y Ciencias, Universidad Adolfo Ibáñez, Chile.
(3) Graduate Program in Neuroscience and Cognition, Federal University of ABC, Sao Paulo, Brazil.

rodlagos@alumnos.uai.cl

Grounded cognition theories hold that conceptual representations are partly formed through interaction, with sensory–motor experiences being crucial for the later neural re-activation (or “simulation”) of meaning that supports semantic memory. Comparing congenitally blind and sighted individuals offers a natural setting to assess the role of visual input in the conformation of conceptual structure, especially for concrete concepts with high visual salience (e.g., “dog”)

We analyzed the BLIND corpus, a set of conceptual property norms collected from congenitally blind and sighted Italian participants, using the asymptotic Chao2BC estimator to quantify semantic richness for each concept. In this dataset, participants had to name as many items as possible for any given concept. Without coverage filtering, most concepts produced unstable estimates with wide confidence intervals. Applying a ≥0.70 coverage threshold improved precision but reduced the dataset to only two concrete concepts—both showing significant group differences. While consistent with grounded cognition predictions, this outcome reveals a methodological dilemma: increasing reliability through coverage filtering can severely limit representativity, biasing the concepts under study.

These findings have implications for concept theory and for neurophysiological studies that use CPN-derived variables in brain–behavior models. Our results show that grounded cognition models of concepts capture some of the variability in the processing of concrete concepts. However, without high and balanced coverage across concepts, cross-group neurocognitive inferences risk conflating sampling artefacts with genuine neural differences. We recommend CPN designs with sampling strategies that ensure consistently high coverage, enabling robust and generalizable integration of behavioral and neural evidence.

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