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Resemblance among similarity measures in semantic representation

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Abstract: Similarity measures, extent to which two concepts have similar meanings, are key to understanding how concepts are represented, with different theoretical perspectives relying on very different sources of data from which similarity can be calculated. Experiential/embodied theories use verbal features or property ratings; distributional/relational ones use co-occurrence. Similarity may also be estimated from tasks like word-association, priming, and other rating studies. Often the different theoretical perspectives are placed in opposition; here we test the extent to which similarity representations based on different measures converge. We used Representational Similarity Analysis and multidimensional scaling on 31 similarity measures. Similarity in age-of-acquisition and word-length were related to similarity in naming and priming; and affective similarity and co-occurrence were also related. More importantly, representational resemblance was shown among embodied, distributional and association-based representations, demonstrating that different data sources are employed in a similar way in building meaningful conceptual representation.