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Semi-supervised Learning with 2D Categories

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Abstract

Research has shown that 1D category representations acquired through supervision change after unsupervised exposures that suggest a different boundary. However, it is unclear whether this effect generalizes to categories in which multiple dimensions are relevant. To address this question, we trained participants on a 2D information integration structure (a diagonal boundary) under supervision. Participants then classified unsupervised items that implied either a steeper or flatter boundary than that established by supervision creating a conflict region where items should switch membership. Participants classified a grid of the stimulus space both immediately before (pretest) and after (posttest) unsupervised learning to assess for differences. We found that conflict-region items were more likely to be classified as members of the opposite class on the posttest, relative to pretest in a manner consistent with the unsupervised learning condition. Implications of these findings for semi-supervised learning research and theories of category learning are discussed.