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Semi-supervised learning in infancy: Infants integrate labeled and unlabeled exemplars to learn new categories

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Abstract

Labels facilitate infants category learning. Providing the same label for a set of distinct individuals enhances infants ability to identify the underlying category. In infants daily life, however, many category exemplars will go unlabeled, and infants will inevitably receive a mix of labeled and unlabeled exemplars when learning real-world object categories. Here, we ask whether 2-year-old infants can integrate these labeled and unlabeled exemplars when learning a novel category. To do so, we draw on machine learning research in semi-supervised learning, a class of algorithms designed to learn from just such mixed data. Our results suggest infants do engage in semi-supervised category learning. Infants learned categories as successfully in a semi-supervised condition as in a fully-labeled conditionand more successfully than in an unlabeled condition. These findings reveal that the power of labels extends beyond the exemplars being labeled: labeling also promotes infants learning from subsequent, unlabeled exemplars.