**Do labels help infants form more specific category representations? A meta-analysis and pre-registration.**

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To learn a new word, infants must do more than associate a word and an object; rather, they need to connect each word to a more general concept. How do infants generalize from individual instances to learn the visual category that a word refers to? Some work suggests that language plays a role in binding instances together. For example, when infants see a series of unfamiliar objects accompanied by the same novel word (versus the same novel, non-linguistic tone), they group these unfamiliar objects together as part of a new visual category (Balaban & Waxman, 1997; https://metalab.stanford.edu). But *how* do labels have this effect? When infants hear a novel label for an object, infants may treat this label as a strong social cue that this object is a true example of a category. Prior work suggests that when learners are certain that each example they see is from the same category, they tend to form tighter, more specific category representations (Xu & Tenenbaum, 2007). Labels may thus aid visual categorization by cueing infants to form tighter, more specific visual representations of categories. We plan to test this hypothesis by examining if labels (versus tones) cue infants to form tighter visual representations of categories that better exclude objects from perceptually similar categories. To do so, we will vary the perceptual similarity of the learned and novel categories presented at test during three separate test trials; pilot testing suggests that including multiple test trials is feasible. Perceptual similarity metrics were obtained using units from a pre-trained deep convolutional neural network (VGG-19) trained to recognize objects (Kubilius et al., 2016). W created five sets of objects categories that vary in perceptual similarity, are unfamiliar to 1-2 year olds, and allow us to present exemplars to each child. We will test a total of 60 infants (12 – 15 m.o.), half of which will hear either labels (“Look, a [dax]”) or tones during familiarization. Our first analysis will be a direct replication of the primary finding, asking whether infants look more towards novel objects when they hear labels during familiarization. We will then examine whether infants who hear labels show a sharper generalization gradient to other novel categories; our pre-registered analysis plan can be found at <https://osf.XX.XXX> and stimuli can be found in the public repository for this project (https://github.com/brialorelle/labelconcept). Systematically varying the perceptual similarity of the categories presented during test trials may allow us a much fine-grained view of how infants quickly map novel words to novel visual concepts.

Even if infants form a coarse visual representation of a new category (e.g., of bike bells), they can likely still distinguish it from a perceptually *dissimilar* category (e.g., hole punches). Conversely, infants need to form a relatively specific visual representation of a category to distinguish it from a perceptually *similar* *category* (e.g., yoyos).

**TO DO:**

--Familiarity testing

--Pre-registration analysis plan draft WRITE and send to Mike

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