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Towards a Probabilistic Representation of Perceptual Category Learning: The Probabilistic Prototype Distortion Task

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Many category learning experiments use supervised learning (i.e., trial-by-trial feedback). Most of those procedures use deterministic feedback, teaching participants to classify exemplars into consistent categories (i.e., the stimulus *i* is always classified in category *k*). Though some researchers suggest that natural learning conditions are more likely to be inconsistent, the literature using probabilistic feedback in category learning experiments is sparse. We believe that this sparsity is due to a relative lack of flexibility of current paradigms and experimental procedures for designing probabilistic feedback experiments. The aim of the work reported here is to offer a novel paradigm (the Probabilistic Prototype Distortion task) which allows researchers experimental flexibility by adjusting *p*(category/feature) probabilities for each exemplar. We set-up a mixed design (n = 36) with three conditions (AB, BA and CA) for both phases of the experiment: Learning (subjects had to learn to which of two categories the exemplar belonged) and Transfer (subjects used a similarity scale to compare the exemplar to the learned categories). Our learning results showed that subjects learned to classify each exemplar into its respective category by block 3 (AB (M = 0.58 percent correct classification, SD = 0.06); BC (M = 0.63, SD = 0.08); CA (M = 0.62, SD = 0.07)). Transfer revealed that subjects discriminated individual features regarding their relevance for classification within each condition. Our results suggest that by designing experiments with our procedures, the experimental setup allows subjects to achieve the desired classification performance.

Keywords: category learning, probabilistic feedback, perceptual categorization, mathematical modeling

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