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One-shot Learning and Classification in Children

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Abstract: People can often generalize concepts from just a single example, while machine learning algorithms typically require hundreds. Lake, Salakhutdinov and Tenenbaum (2016) studied this ability in the domain of handwritten characters, and proposed a model for one-shot learning of new concepts based on inferring compositionally structured generative models, and transfer (or learning to learn) from familiar concepts. Lake et al showed that their model fit well with the classifications and drawings of adults, but provided no direct evidence for the role of learning to learn which presumably occurs mostly in children learning to draw. Here we study the drawing and classification abilities of children ages 3-5, asking whether their ability to classify novel objects and handwritten characters is related to their ability to infer an appropriate motor program for drawing or tracing characters. Preliminary results suggest at least a weak relationship between these abilities, independent of age.