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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Permalink

Journal

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Publication Date

2016

Peer reviewed

Modeling the Influence of Knowledge on Recognition: Connecting visual recognition behavior across development to PDP computational models of semantic knowledge

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Abstract: Recent behavioral findings in children's selection of a "real" versus "silly" animal demonstrated a developmental change wherein younger children select chimeric animals with regular forms (e.g., a seal with four legs, a camel with no hump) as real. To reduce verbal demands while maintaining the same stimuli, we developed a touch screen change-detection task in which children (4 – 7-years-old) were instructed to locate a single changing feature (e.g., a rhinoceros with and without a horn) as fast as possible. Children were faster to find changes when the feature appeared on animals with more prototypic animal forms (e.g., a donkey with and without a hump) when compared to animals with atypical forms (e.g., a camel with and without a hump). Alongside exploration via computational models, these findings suggest that children's real-world object recognition is supported by the interplay of semantic knowledge, informed by covariation among visual features, and visual recognition.