# The Cognitive and Development Alignment of Computer Vision Models on the Raven Test of Fluid Intelligence

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## Abstract

Prior studies have evaluated the cognitive alignment of computer vision models and humans on *fluid reasoning*: the ability to solve novel, abstract problems independent of prior knowledge. This is commonly measured using the Raven Advanced Progressive Matrices (RAPM) test. Prior studies investigating how well Convolutional Neural Networks (CNNs) solve Ravens problems have found partial cognitive alignment with the performance of adults. We replicate this work using the ResNet-18 model trained on RAPM and, critically, extend for the first time to the question of developmental alignment: Does the improvement of ResNet-18's improvement across training track the developmental progression observed in children? We find evidence of partial developmental alignment: ResNet-18's performance over training follows a power function similar to the one that characterizes children's performance over development. A notable discrepancy is that the model performs best on the hardest problems, suggesting that it exploits shortcuts rather than engaging in genuine fluid reasoning.



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