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Tuning the speed-accuracy trade-off in optimal decision policies during development

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Abstract

As children age, the ability to make decisions about perceptual information improves in terms of both speed and accuracy. However, understanding the delicate changes within both the decision-making process and the ability to optimize the trade-off between speed and accuracy with age remains a challenge. This study employed the diffusion decision model to investigate age-related developments in perceptual decision-making. Additionally, the impact of practice and end-of-block feedback on achieving optimal decision-making was investigated. We gathered behavioral data from 299 children aged 6 to 12 and 50 adults while they performed a motion discrimination task. Adults and older children had narrower decision criteria, higher drift rates, and shorter non-decision times compared to younger children. Furthermore, individuals tended to approach the optimal policy as they aged, and for both children and adults, practicing and receiving detailed feedback could speed up the attainment of the optimal policy.