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# Characterizing Age-Related Change in Learning the Value of Cognitive Effort

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## Abstract

To behave efficiently, individuals must decide when to exert cognitive effort by weighing its benefits and costs. While adults often make such economical choices, less is known about how these decisions develop. Here, we tested whether children and adolescents (N=150, 10-20 years) also learn about the value of cognitive effort during a task-switching experiment manipulating the reward benefits (higher vs. lower incentives) and difficulty costs (easy vs. hard conditions) of engaging cognitive effort. Mixed-effects modeling analyses examining the influences of age, learning over time, and the reward and difficulty manipulations on task-switching performance revealed that accuracy improved significantly more rapidly for higher than lower incentives with increasing age, especially during the beginning and middle of learning. Meanwhile, accuracy improved marginally more rapidly for the easy than hard condition with increasing age. Together, these results suggest that reward and difficulty information distinctly guide cognitive effort across time and age.