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”Did I really do that?!” Unexpected outcomes of children’s own actions as a driver of learning and exploration

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Abstract

Children hold rich expectations about the physical and social world. While observing objects, events, and agents that violate these expectations elicit surprise and enhanced exploration—reflecting prediction error (PE) about the world—, it remains unknown whether children are also sensitive to prediction errors about the outcomes of their very own actions. Here we investigate whether four- to five-year-old children (N=96) are surprised when their self-guided choices produce unexpected outcomes. Upon achieving unexpected success in a chance-based card game, children who did so via their own unguided choices reported more surprise than children who produced the same success with help of a reliable aid. Moreover, in choosing what to explore next, children chose to re-play the surprise-inducing game over a novel, alternative game. Despite prior literature suggesting overconfidence in young children, these results indicate that children are sensitive to their own abilities, readily detecting expectation-outcome discrepancies in their own action outcomes.