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Pre-term infants exhibit impaired prediction and learning in Audio-Visual association paradigm

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Abstract: Forming reliable predictions about upcoming events are both essential to and the product of successful learning. Using fNIRS recording of cortical hemodynamics, we measured infants' prediction of upcoming visual events that were preceded by auditory cues in infants who are at-risk for poor development due to premature birth and their full-term peers. We compared prediction and learning across groups by fitting their occipital cortex response (which we assumed to reflect the magnitude of the prediction error) to a reinforcement learning model with a dynamic learning rate. We found that preemies had a lower learning rate than full-terms. These findings shed light on the origins of the developmental difficulties associated with prematurity.