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Reinforcement learning models of tradeoffs between infant attachment and curiosity

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Abstract

Infants must balance interacting with a caregiver and navigating the environment, driven by their curiosity and attachment. This decision involves trading off proximity seeking with the caregiver and novelty seeking in the surroundings. Our hypothesis is that different attachment styles may arise as adaptive reward-seeking strategies based on different frequencies and scales of rewards from both caregiver and environment, including negative rewards due to distressing encounters. We implement a computational model using a reinforcement learning framework to model infants' attachment and exploratory behaviors as a bandit problem. We study how infants' exploratory behaviors emerge as they learn from their caregiver and how these learned behaviors transfer to a new caregiver. Our work expands upon existing computational models of attachment and models how social factors can influence curiosity-seeking as infants learn to explore versus exploit.