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## **Sex differences in cognition, emotional reactivity, and motor ability in gonadally-intact middle-aged marmosets (*Callithrix jacchus*)**

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Sex differences in cognition are well documented. Women outperform men on measures of perceptual speed and verbal abilities, while men outperform women on tests of spatial processing. Robust sex differences also exist in stress responses. However, it is unclear how these sex differences change over time and whether males and females follow different trajectories of age-related cognitive decline. Studies in nonhuman primate models can help resolve this issue. The common marmoset (*Callithrix jacchus*) is a New World primate with a short lifespan that can perform complex cognitive tasks in computerized settings that are comparable to those used with humans. The present study is part of a longitudinal project aimed at determining whether males and females follow different trajectories of cognitive aging. This report focuses on sex differences at study entry. Thirteen marmosets (7 females), aged 4-6 years were tested on a comprehensive battery of tasks assessing cognitive function, motor skills and emotional reactivity. For cognition, monkeys were initially trained on a simple visual discrimination problem, followed by reversal learning using the Cambridge Neuropsychological Test Automated Battery (CANTAB). They also performed the Hill-and-Valley task as a measure of fine motor skills. To assess emotional reactivity, each marmoset was separated from their colony for 7 hours. Behavioral assessments, which involved recording the occurrence of approximately 25 behaviors, occurred a total of 6 times: immediately before separation, 3 times during separation, immediately after separation, and 24-hr later. No sex difference was found for simple discrimination, but males tended to perform better than females on the reversal learning task. No sex difference was observed in motor skills. During separation from the colony, females were more reactive than males, as indicated by more agitated locomotion, and vocalizations. Together, these findings expand upon previous studies and demonstrate sex differences in reversal learning and emotional reactivity in gonadally-intact middle-aged marmosets. As the study progresses, we should be able to determine the neural correlates of these sex differences and how they may change with aging.

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