

Spatial learning and memory: sex does matter

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In many mammalian species, it is known that males and females differ in spatial learning ability. Overall males seem to have superior spatial skills than females. However, much controversy exists about the role of sex in spatial navigation. The present study investigated sex related differences using a Morris task. We used 5-month-old male and female Wistar rats which were housed in pairs. We subsequently tested three versions of the Morris task, ie: an allocentric task (8 days; 4 trials/day), a cue based (2 days; 4 trials/day) and an egocentric task (7 days; 4 trials/day). In the allocentric task starting positions in the pool were random and the platform was located in a fixed location beneath the water surface. Extra-maze, environmental cues must be used for spatial navigation. In the cue based test the starting positions and the platform location was random. The platform emerged from the water and was visible, allowing rats to use intra-maze/target cues to escape from the water. In the egocentric task the starting positions and the submerged platform were randomly chosen although the angle and distance between both was the same. In the allocentric water escape task significant differences in performance between male and female rats were observed for acquisition and probe trials. Neither in the cue based version of the Morris task, nor in the egocentric version differences between male and female animals were observed. The difference between male and female animals appears to lay in the allocentric spatial superiority of male animals. Our data suggest that males are better at forming a spatial map of the environment, based on environmental extra-maze cues. To investigate the sex difference in allocentric orientation in more detail a sophisticated analysis of search strategies used by these rats will be investigated as proposed by Graziano et al. (2003).

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