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Spatial Ability Shapes Early Skill Acquisition in Drone Racing

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Drone racing is a highly spatial task, which requires mentally rotating the drone and integrating information across viewpoints, but its relationship with spatial abilities has rarely been examined. In this study, college-aged students played a virtual drone racing game on a desktop computer using an Xbox controller. After learning the controls, participants completed five races on the same track, and race completion time was recorded. In a separate online session, participants completed a battery of validated and efficient spatial ability tests, including mental rotation, mental folding, mental sectioning, and object assembly. Better object assembly ability ($r = .43$) and mental rotation ability ($r = .35$) predicted better racing performance, while mental folding and sectioning did not. Spatial ability was a stronger predictor of performance in the initial race, but its influence decreased as participants gained experience, suggesting that spatial ability is most important in the early stages of skill development.