

Impact of Mood States on Executive Function Testing: Considerations for Sports Medicine Professionals

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ABSTRACT

Baseline testing of *executive function* (EF) is frequently conducted by Sports Medicine professionals to assess post-concussion recovery in athletes. Among the neuropsychological tasks utilized for EF assessment, Serial Subtraction 3 (SS3) and 7 (SS7) are widely employed. Despite the objective nature of these tests in measuring cognition, their accuracy can be potentially impacted by mood states (e.g., anger, vigor). **PURPOSE:** To investigate the potential relationships between moods and performance on SS3 and SS7. **METHODS:** Participants ($n = 198$; male = 78, female = 120; Age = 37.96 ± 17.62 yrs; height = 169.70 ± 10.20 cm; weight = 75.01 ± 19.40 kg) completed a single session where they first completed the Profile of Mood Survey Short Form (POMS-SF) followed by the SS3 and SS7 tasks. Additionally, participants were asked to provide information about their education levels, prior night's sleep, polyphenol and caffeine consumption, physical activity levels, stress levels, and history of head injuries through a series of surveys. A multivariate backwards elimination regression was conducted while controlling for age, sex, BMI, education status, prior night's sleep, polyphenol and caffeine consumption, physical activity levels, stress levels, and the number of head injuries, to examine the relationship between mood and performance on SS3 and SS7 tasks. The predictor variables in the regression model were the scores on the different components of the POMS-SF. **RESULTS:** For the SS3, higher anger (POMS) scores were significantly associated with lower accuracy on the task ($\beta = -4.935$, $p = .014$). Conversely, for the SS7 task, higher vigor (POMS) scores were significantly associated with higher accuracy ($\beta = .502$, $p = .007$). **CONCLUSION:** Findings suggest that the Sports Medicine team should consider the impact of mood when evaluating cognitive task performance. Specifically, the findings suggest that higher levels of anger may have a detrimental effect on performance on basic mathematical tasks, while higher levels of vigor may have a beneficial effect on performance on more complex mathematical tasks that rely on working memory. Therefore, it may be prudent for Sports Medicine professionals to assess mood and cognitive task performance to obtain a more comprehensive understanding of their athletes' cognitive functioning.