The Effect of Affect during High Intensity Interval Training on Executive Function

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PURPOSE: The purpose of this study was to examine the influence of affective states before, during and after an acute bout of exercise on executive function. **METHODS**: Young adults (*N* = 48, *M* age = 25.46, 83.3% ♀, BMI = 24.19) completed the Feeling Scale (FS) various times during a 20-min, high intensity interval training (HIIT). Following the bout, they completed the Physical Activity Enjoyment Scale (PACES) and two executive function tasks - Flanker and Sternberg. The HIIT consisted of a 2.5 min warmup, eight rounds (work:recovery = 20s:10s) of high knees, burpees, and mountain climbers, followed by a 2.5 min cool-down. FS was assessed before (FS1) and after (FS2) the warmup, every 5-minutes (FS3, FS4, FS5) during the session, and after the cool-down (FS6). Following the cool-down, participants completed PACES while resting for 5 minutes, and then completed the Flanker and Sternberg tasks. Affective valence was measured as the average FS score during the session (FS_{AVG}) and following the cool-down (FS_{END}). Executive function was determined by reaction time (RT, ms) and accuracy (%) on the tasks. Groups of higher and lower FS_{AVG} and PACES were determined based on a median split to assess feeling states during and following HIIT. **RESULTS**: Bivariate correlations were low but significant ($P < 0.05$) for Sternberg accuracy-FS_{AVG} ($r = 0.31$) and Sternberg accuracy-FS_{END} ($r = 0.32$). A moderately negative correlation was found between Flanker RT and PACES ($r = -0.46$), FS_{AVG} ($r = -0.38$) and FS_{END} ($r = -0.58$). Group differences in Flanker RT were observed between higher/lower FS_{AVG} ($M = 460.10$ vs $M = 497.68$, $P < 0.05$, $d = 0.81$) and between higher/lower PACES ($M = 465.04$ vs $M = 495.57$, $P < 0.05$, $d = 0.43$). **CONCLUSION**: The pattern of findings suggests that young adults who felt more positively during, and had higher enjoyment following, an acute bout of HIIT showed better executive functioning. The results suggest that examining affective responses during and after exercise are important players in the acute exercise-cognition relationship. Future studies should more carefully explore this mediating role of affect on cognition across various exercise modalities.