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Matthew Manzo
Sacred Heart University

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The Effect of BCAA Supplementation on Mental Performance Following Exercise

Matthew Manzo [Mentor: Beau Greer, PhD]
Department of Physical Therapy and Human Movement Science

PARTICIPANTS
Fourteen male NCAA Division I soccer athletes participated in this study after providing informed consent. All methods were approved by the Sacred Heart University Institutional Review Board. All subjects underwent the same daily exercise regimen for 3 months prior to the study. The mean age and BMI of the subjects were 20 ± 1 years and 23.6 ± 1.9, respectively, with a mean height and weight of 70.4 ± 2.3 inches and 166.2 ± 20.6 pounds, respectively.

METHODS
The subjects took part in a standardized workout consisting of a dynamic warm-up, reaction-training drills, agility drills, relay races, and sprinting exercises. The workout was approximately 80 minutes in duration and largely consisted of sport-specific exercises. The night prior to testing, each subject consumed at least 0.5 Liters of water along with a standardized 520 Calorie meal of wheat-based crackers (8g protein; 96g carbohydrates; 12g fat). The subjects were randomly assigned to two groups, each receiving solutions to drink prior to and during the exercise bout containing either BCAAs (SUPP) (n = 7) or an equal caloric amount of maltodextrin (PLAC) (n = 7). PLAC consumed 32 ounces of a zero-calorie mixture of water and artificial sweetener (Crystal Light, Northfield, IL). The BCAA subjects consumed 32 ounces of water, with unflavored BCAA powder dissolved in it in addition to the artificial sweetener, containing 18 grams of BCAA (powder form) with a ratio of leucine to isoleucine to valine of 3:1:1. The ratio and dosages are comparable to recent investigation in which administration of BCAAs were involved.5-8 The subjects consumed their respective beverages in eight-ounce increments every twenty minutes with the first consumption being five minutes prior to the beginning of the workout. Ten minutes prior to the exercise, the subjects’ visual scanning, motor speed, and selective attention ability was measured using the Trail Making Test (Parts A and B) and the Stroop Color and Word Test. Immediately following the exercise, the subjects were tested again using the same tools. Both of these tests are valid and reliable tests to measure brain function/dysfunction.8,11,9 A measure of each subject’s rating of perceived exertion (RPE) was obtained thirty minutes following the exercise. This method of collecting a session RPE has been validated and shown to be a reliable subjective tool.10

RESULTS
Fourteen subjects completed all testing procedures and were thus included in the final statistical analyses.

DISCUSSION
The present data suggests that there may be a cognitively enhancing effect post-exercise from supplementing with BCAAs. However, this suggestion must be considered cautiously as the supplemented exercise was seen to be just as effective as the placebo according to the metrics used. While there was no significant performance-enhancing effect observed during either of the Trail Making Tests (supposedly assessing speed of cognition and executive functioning), this may have actually been a reflection of the subject’s ability to memorize the test as an element of familiarization was present. Due to high subject dropout rate, the sample size was relatively small. This study would benefit from a second trial such that the SUPP group would receive a placebo and the PLAC group would receive BCAAs.

REFERENCES