

# Gender Differences in Neurocognitive and Symptom Baseline Testing: Symptom Factors and Affect (Emotion)



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**Purpose:** Research has documented that females tend to report more concussion-related symptoms than males, though the types of symptoms reported are less clear. This retrospective study investigated gender differences in cognitive performance and symptom reporting on baseline computerized testing in a sample of college athletes.

**Methods:** The archival database of ImPACT baseline administrations collected by a university athletic and health service department was utilized. This study was approved by the university's institutional review board. Test administrations were excluded if there was evidence of : 1) invalid test results, 2) recent concussion, and 3) the baseline was a repeated assessment associated with the same participant. The baseline sample included 635 ImPACT administrations with 32.5 % females. Athletes were 17 to 23 years old with no significant differences between males and females with regard to concussion history.

**Results:** Females had significantly better verbal memory ( $p < .001$ ) and reaction time ( $p = .02$ ) than males. Females reported significantly more symptoms than males ( $p = .008$ ). Principal Components Analysis was conducted and the five components, in order of significance, included *Physical/Cognitive-Affective-Fatigue-Migraine-Sleep*. At baseline, females reported significantly more *Affective (Emotional)* symptoms than males ( $p < .001$ ), whereas males reported significantly more *Fatigue* symptoms than females ( $p = .04$ ).

**Conclusions:** These findings 1) identify 5 symptom factors that are based on research evidence, rather than just clinical opinion; 2) reveal that females endorse more symptoms than males in general, even without a concussion; thus one may not be able to conclude that females are more symptomatic specifically from concussion than are males; and 3) question the value of current symptom checklists that may make females appear more symptomatic than males because of the inclusion of affective (emotional) test items.

ImPACT Composite	Male Mean (SD)	Female Mean (SD)
Verbal Memory <sup>a</sup>	86.1 (9.5)	89.6 (8.4)
Visual Memory	76.9 (12.4)	76.7 (11.4)
Visual Motor Speed	39.0 (6.2)	39.9 (5.5)
Reaction Time <sup>b</sup>	.59 (.07)	.58 (.06)
Impulse Control	5.9 (4.9)	5.6 (4.2)
Total Symptom Score <sup>c</sup>	3.4 (7.0)	5.0 (6.7)

a.  $t(633) = 4.56, p < .001$ ; b.  $t(633) = -2.31, p = .02$ ; c.  $t(633) = 2.66, p = .008$