

RESULTS

Normative Data for the ImPACT Composite Scores

A sample of 205 elementary, junior high, and high school students was initially used for this project. Three of these subjects had incomplete test data and were subsequently dropped from the normative sample. The current normative sample consists of 102 boys and 100 girls between the ages of 11 and 14. Multiple analysis of variance (MANOVA) was performed to allow an analysis of performance differences between gender and age across multiple neuropsychological domains. Within the sample, there were no differences on the four composites that were attributable to gender (Rao's R = .796; $p=.553$). The MANOVA did yield significant differences for age (Rao's R = 3.025; $p=.000108$). To understand the group differences, univariate F tests were completed for the ImPACT composite scores and demonstrated significant effects for age on the Processing Speed and Reaction Time composite scores (see Table 1). Therefore, the normative data needed to be presented by age but not gender (see Table 2).

Table 1: MANOVA for Age

Dependent Variable	F (df1, 2)	p-level
	3,194	
Verbal Memory	.649	.585
Visual Memory	.616	.605
Processing Speed	12.218	.000
Reaction Time	6.570	.000
Impulse Control	.783	.505

Table 2: Means and Standard Deviations by Age

Age	Verbal Memory	Visual Memory	Processing Speed	Reaction Time	Impulse Control
11 year olds (n=47)	83.44 (8.56)	70.85 (12.27)	27.93 (6)	.67 (.09)	15.53 (12.95)
12 year olds (n=49)	82.59 (10.78)	74.20 (12.86)	32.12 (7.32)	.62 (.08)	12.71 (9.69)
13 year olds (n=55)	82.98 (10.65)	73.32 (13.12)	33.03 (6.37)	.62 (.07)	13.87 (13.46)
14 year olds (n=51)	85.02 (8.73)	73.19 (13.25)	35.72 (5.89)	.59 (.09)	12.29 (10.28)

Normative Data for the Postconcussion Scale

Analysis of variance (ANOVA) using the sample described above (N of 202) yielded significant differences between age and postconcussion symptom score ($F=4.953$; $p= .002$) and between gender and postconcussion score ($F= 8.507$; $p= .004$). Therefore, the normative data for the ImPACT Postconcussion Scale was stratified by age and gender (Table 3).

Table 3: Postconcussion Normative Data

Gender/Age	Symptom Total Mean (SD)
Boys/ 11 yrs. (n=23)	.7 (1.4)
Girls/ 11 yrs. (n=24)	0 (0)
Boys/ 12 yrs. (n=26)	1.34 (2.24)
Girls/ 12 yrs. (n=23)	.56 (1.92)
Boys/ 13 yrs. (n=26)	1.84 (6.68)
Girls/ 13 yrs. (n=29)	0 (0)
Boys/ 14 yrs. (n=27)	6.2 (11.20)
Girls/ 14 yrs. (n=24)	1.41 (2.5)