

Virginia Beach City Public Schools

An Analysis of the Relationships Between Assessments: PSAT, SAT, and CWRA+ Executive Summary

Author: Douglas G. Wren, Ed.D., Assessment Specialist
Department of Planning, Innovation, and Accountability

Other Contact Person: Donald E. Robertson, Jr., Ph.D., Assistant Superintendent
Department of Planning, Innovation, and Accountability

Background

Test data for Virginia Beach City Public Schools (VBCPS) high school juniors who took the College and Work Readiness Assessment (CWRA+) during January and February of 2014 were correlated with data from two College Board assessments to determine the strength of the relationships between the scores of the tests. Data were used from the CWRA+ and Preliminary SAT (PSAT) administrations during the 2013-2014 school year. Data for this junior cohort were also acquired from SAT administrations that occurred at any time during high school. Only the highest score in each SAT section was used for students who took the test multiple times.

The most commonly used method of correlating two variables—the Pearson product-moment correlation coefficient or Pearson’s r —was employed to measure the strength of the linear association between two test scores. Data were disaggregated by high school for the correlations between the total score of the CWRA+ and each section score of the PSAT, as well as between the CWRA+ total score and each SAT section score.

Correlation coefficients range from -1.00 to 1.00 ; this indicates the direction and strength of the relationship. A negative coefficient will occur when the score of one test increases while the score of the other test decreases, and vice versa, for most students. When the values of both variables tend to increase for most observations, a positive correlation coefficient will result. These guidelines* were used to interpret the strength of the coefficients for the present analyses:

- $r = .70$ or greater indicated a very strong relationship
- $r = .40$ to $.69$ indicated a strong relationship
- $r = .30$ to $.39$ indicated a moderate relationship
- $r = .20$ to $.29$ indicated a weak relationship
- $r = .01$ to $.19$ indicated no relationship

Results

The key findings from the analyses are summarized in the following sections.

PSAT and SAT Correlations

- Correlations between PSAT and SAT scores indicated very strong relationships between the corresponding sections of each test, as shown below.
 - Correlation between PSAT and SAT critical reading section scores = 0.84
 - Correlation between PSAT and SAT mathematics section scores = 0.82
 - Correlation between PSAT writing skills section scores and SAT writing section scores = 0.81
- The PSAT/SAT correlations indicated PSAT scores are valid predictors of SAT scores for most VBCPS juniors who take both tests. These results were expected but may be different for students in grades 9-10.

Time Spent on the CWRA+

- The correlation between the total time spent on both sections of the CWRA+ (i.e., performance task and selected-response items combined) and CWRA+ total scores indicated a strong relationship ($r = 0.45$) between the number of minutes until students submit their responses and their total score on the CWRA+.
- There was a strong correlation between time spent and CWRA+ performance task section scores ($r = 0.53$) and a weak correlation between time spent and selected-response section scores (0.23). This implied many students who took more time were inclined to score higher on the performance task, while the amount of time spent was far less of a factor for students’ scores on the selected-response section.

*Pearson’s r Correlation: A Rule of Thumb, <http://faculty.quinnipiac.edu/libarts/polsci/Statistics.html>, accessed on February 2, 2015.

CWRA+ and PSAT Correlations

- The correlation coefficient between CWRA+ total scores and PSAT critical reading section scores indicated a very strong relationship ($r = 0.75$).
- The correlation between CWRA+ and PSAT writing skills section scores was also very strong (0.73).
- The correlation between CWRA+ and PSAT mathematics section scores was strong (0.64).

CWRA+ and SAT Correlations

- At the division level, correlations between CWRA+ scores and SAT section scores were the same as the correlations between CWRA+ scores and PSAT section scores (rounded to two decimal places).
- At the high school level, there was no perceptible pattern between CWRA+ and PSAT section correlations and corresponding CWRA+ and SAT correlations.

Interpretation of Correlations

- Results suggest a very strong relationship between VBCPS juniors' performance on the CWRA+ and the critical reading and writing skills sections of the PSAT and SAT. In other words, for most VBCPS juniors, those who performed well on the CWRA+ were likely to have performed well on the PSAT/SAT critical reading and writing skills sections.
- This conclusion seems reasonable, as both sections of the CWRA+ require proficiency in critical reading, and the ability to construct a response to the performance task is related to writing skills.
- There was a strong relationship between performance on the CWRA+ and the PSAT/SAT mathematics section. However, this relationship was not as strong as the relationships involving the other sections.
- Correlations between CWRA+ subscores (e.g., analysis & problem solving, writing effectiveness, scientific & quantitative reasoning) and PSAT/SAT section scores yielded lower coefficients than those in the table.

Correlations Between CWRA+ Total Scores and PSAT/SAT Section Scores

| High School | PSAT CR | | PSAT M | | PSAT WS | | SAT CR | | SAT M | | SAT W | |
|----------------|---------|------|--------|------|---------|------|--------|------|-------|------|-------|------|
| | n | r | n | r | n | r | n | r | n | r | n | r |
| Bayside | 282 | 0.70 | 282 | 0.58 | 281 | 0.73 | 201 | 0.74 | 201 | 0.64 | 201 | 0.75 |
| Cox | 352 | 0.79 | 351 | 0.66 | 351 | 0.76 | 283 | 0.73 | 283 | 0.67 | 283 | 0.71 |
| First Colonial | 395 | 0.74 | 393 | 0.63 | 394 | 0.68 | 313 | 0.68 | 313 | 0.55 | 313 | 0.66 |
| Green Run | 254 | 0.70 | 254 | 0.59 | 253 | 0.63 | 141 | 0.67 | 141 | 0.58 | 141 | 0.64 |
| Kellam | 338 | 0.75 | 338 | 0.64 | 337 | 0.69 | 295 | 0.74 | 295 | 0.62 | 295 | 0.71 |
| Kempsville | 313 | 0.72 | 312 | 0.58 | 311 | 0.71 | 172 | 0.71 | 172 | 0.53 | 172 | 0.70 |
| Landstown | 414 | 0.68 | 414 | 0.48 | 413 | 0.63 | 296 | 0.70 | 296 | 0.51 | 296 | 0.66 |
| Ocean Lakes | 414 | 0.76 | 414 | 0.70 | 413 | 0.75 | 308 | 0.77 | 308 | 0.69 | 308 | 0.72 |
| Princess Anne | 310 | 0.82 | 310 | 0.75 | 310 | 0.78 | 247 | 0.77 | 247 | 0.70 | 247 | 0.79 |
| Salem | 323 | 0.72 | 323 | 0.58 | 323 | 0.72 | 226 | 0.71 | 226 | 0.61 | 226 | 0.71 |
| Tallwood | 364 | 0.76 | 363 | 0.63 | 359 | 0.71 | 254 | 0.76 | 254 | 0.66 | 254 | 0.69 |
| VBCPS | 3,759 | 0.75 | 3,754 | 0.64 | 3,745 | 0.73 | 2,736 | 0.75 | 2,736 | 0.64 | 2,736 | 0.73 |

Note. Highlighted cells contain correlation coefficient values that exceeded the coefficient value at the division level.

n = number of students with valid test scores for the CWRA+ and PSAT or SAT section

r = Pearson product-moment correlation coefficient

CR = critical reading section (PSAT and SAT)

M = mathematics section (PSAT and SAT)

WS = writing skills section (PSAT)

W = writing section (SAT)

