

Predictability Study of ISIP Reading and STAAR Reading: Prediction Bands

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Chalie Patarapichayatham, Ph.D.

Introduction

This study provided evidence that Istation's Indicators of Progress (ISIP™) reading assessments' cut scores can predict passing scores for the State of Texas Assessments of Academic Readiness (STAAR) reading tests. This study used ISIP Early Reading (3rd grade), ISIP Advanced Reading (4th–8th grade), and STAAR reading tests and applied simple linear regression analysis for each grade's data. Predictability “bands” were further computed by using the confidence interval (CI) approach to obtain the ISIP reading cut score to predict passing STAAR reading tests. Results of a simple linear regression showed that the ISIP reading measures are highly predictive of STAAR reading scores.

The ISIP reading cut scores to predict passing STAAR reading tests for (a) Approaches Grade Level Performance, (b) Meets Grade Level Performance, and (c) Masters Grade Level Performance are reported. The STAAR Performance Labels and Policy Definitions are as follows. “Approaches Grade Level Performance” indicates that students are likely to succeed in the next grade or course with targeted academic intervention. Students in this category generally demonstrate the ability to apply the assessed knowledge and skills in familiar contexts. “Meets Grade Level Performance” indicates that students have a high likelihood of success in the next grade or course but may still need some short-term, targeted academic intervention. Students in this category generally demonstrate the ability to think critically and apply the assessed knowledge and skills in familiar contexts. “Masters Grade Level Performance” indicates that students are expected to succeed in the next grade or course with little or no academic

intervention. Students in this category demonstrate the ability to think critically and apply the assessed knowledge and skills in varied contexts, both familiar and unfamiliar.

Methods

Measures

This study used results from ISIP Early Reading for 3rd grade, ISIP Advanced Reading for 4th–8th grade, and STAAR reading tests for 3rd–8th grade from the 2014–2015 school year. ISIP Overall Reading Ability Middle of Year (MOY) scores from the 2014–2015 school year and STAAR reading scores from 2014–2015 for these same students were used. Table 1 shows the Pearson product-moment correlation coefficients. The correlations between ISIP reading and STAAR reading scores were relatively high, indicating a strong relationship between ISIP reading measures and STAAR reading tests. The correlation coefficients were 0.737, 0.735, 0.706, 0.752, 0.549, and 0.628 for grades 3 through 8, respectively.

Samples

The sample included 12,648 students from 3rd through 8th grade in one district in the state of Texas. There were 3,397 3rd grade students; 3,400 4th grade students; 3,556 5th grade students; 1,116 6th grade students; 730 7th grade students; and 449 8th grade students. The means of STAAR reading scores were 1,438.26; 1,509.61; 1,566.24; 1,574.71; 1,566.60; and 1,588.16 for grades 3 through 8, respectively. The means of ISIP Overall Reading Ability MOY scores were 253.00; 1,958.99; 2,036.32; 2,066.62; 2,017.96; and 2,087.84 for grades 3 through 8, respectively.

Analysis

The simple linear regression analysis was applied for each grade's data by using SPSS software. The ISIP Overall Reading Ability MOY score was the predictor, and the STAAR reading score was the outcome variable. Then the confidence interval (CI) was further computed.

The confidence interval (CI) for the average expected value of y for a given x^* is as follows:

$$E(y | x^*) = \hat{y} \pm t_{n-2}^* \sqrt{\frac{1}{n} + \frac{(x^* - \bar{x})^2}{(n-1)s_x^2}}$$

where s_y is the standard deviation of the residuals, calculated as $s_y = \sqrt{\frac{\sum (y_i - \hat{y}_i)^2}{n-2}}$.

Next, the ISIP reading scores around the STAAR reading cut point for the lower bound and the upper bound of the CI were selected. The STAAR performance standards in Table 2 were used to compute ISIP reading cut scores to predict passing STAAR reading tests.

Results

The confidence interval (CI) was applied to obtain the prediction band for each grade within each STAAR reading performance standard from simple linear regression results. The confidence level was set at 0.95. Table 3 shows the prediction bands for Approaches Grade Level Performance, Meets Grade Level Performance, and Masters Grade Level Performance STAAR reading performance standards across grades, and Table 4 shows ISIP reading cut scores to predict passing STAAR reading tests. The results are reported as follows.

Approaches Grade Level Performance

For 3rd grade, the prediction band ranges from 234 to 236. The ISIP Early Reading (ER) score at 236 is the cut score. It is 95 percent certain that a group of students who have an ISIP ER

score of 236 will score higher than the STAAR reading cut score 1,345, meaning that 3rd grade students who score 236 or higher on ISIP ER will most likely pass STAAR reading tests.

For 4th grade, the prediction band ranges from 1,828 to 1,846. The ISIP Advanced Reading (AR) score at 1,846 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 1,846 will score higher than the STAAR reading cut score 1,434, meaning that 4th grade students who score 1,846 or higher on ISIP AR will most likely pass STAAR reading tests.

For 5th grade, the prediction band ranges from 1,817 to 1,846. The ISIP AR score at 1,846 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 1,846 will score higher than the STAAR reading cut score 1,470, meaning that 5th grade students who score 1,846 or higher on ISIP AR will most likely pass STAAR reading tests.

For 6th grade, the prediction band ranges from 1,933 to 1,972. The ISIP AR score at 1,972 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 1,972 will score higher than the STAAR reading cut score 1,517, meaning that 6th grade students who score 1,972 or higher on ISIP AR will most likely pass STAAR reading tests.

For 7th grade, the prediction band ranges from 2,010 to 2,059. The ISIP AR score at 2,059 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 2,059 will score higher than the STAAR reading cut score 1,567, meaning that 7th grade students who score 2,059 or higher on ISIP AR will most likely pass STAAR reading tests.

For 8th grade, the prediction band ranges from 2,069 to 2,123. The ISIP AR score at 2,123 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 2,123 will score higher than the STAAR reading cut score 1,587, meaning that 8th grade students who score 2,123 or higher on ISIP AR will most likely pass STAAR reading tests.

Meets Grade Level Performance

For 3rd grade, the prediction band ranges from 259 to 260. The ISIP ER score at 260 is the cut score. It is 95 percent certain that a group of students who have an ISIP ER score of 260 will score higher than the STAAR reading cut score 1,468, meaning that 3rd grade students who score 260 or higher on ISIP ER will most likely pass STAAR reading tests.

For 4th grade, the prediction band ranges from 2,030 to 2,046. The ISIP AR score at 2,046 is the cut score. It is 95 certain that a group of students who have an ISIP AR score of 2,046 will score higher than the STAAR reading cut score 1,550, meaning that 4th grade students who score 2,046 or higher on ISIP AR will most likely pass STAAR reading tests.

For 5th grade, the prediction band ranges from 2,077 to 2,092. The ISIP AR score at 2,092 is the cut score. It is 95 certain that a group of students who have an ISIP AR score of 2,092 will score higher than the STAAR reading cut score 1,582, meaning that 5th grade students who score 2,092 or higher on ISIP AR will most likely pass STAAR reading tests.

For 6th grade, the prediction band ranges from 2,176 to 2,215. The ISIP AR score at 2,215 is the cut score. It is 95 certain that a group of students who have an ISIP AR score of 2,215 will score higher than the STAAR reading cut score 1,629, meaning that 6th grade students who score 2,215 or higher on ISIP AR will most likely pass STAAR reading tests.

For 7th grade, the prediction band ranges from 2,378 to 2,496. The ISIP AR score at 2,496 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 2,496 will score higher than the STAAR reading cut score 1,674, meaning that 7th grade students who score 2,496 or higher on ISIP AR will most likely pass STAAR reading tests.

For 8th grade, the prediction band ranges from 2,397 to 2,516. The ISIP AR score at 2,516 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score

of 2,516 will score higher than the STAAR reading cut score 1,700, meaning that 8th grade students who score 2,516 or higher on ISIP AR will most likely pass STAAR reading tests.

Masters Grade Level Performance

For 3rd grade, the prediction band ranges from 277 to 278. The ISIP ER score at 278 is the cut score. It is 95 percent certain that a group of students who have an ISIP ER score of 278 will score higher than the STAAR reading cut score 1,555, meaning that 3rd grade students who score 278 or higher on ISIP ER will most likely pass STAAR reading tests.

For 4th grade, the prediction band ranges from 2,169 to 2,196. The ISIP AR score at 2,196 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 2,196 will score higher than the STAAR reading cut score 1,633, meaning that 4th grade students who score 2,196 or higher on ISIP AR will most likely pass STAAR reading tests.

For 5th grade, the prediction band ranges from 2,264 to 2,297. The ISIP AR score at 2,297 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 2,297 will score higher than the STAAR reading cut score 1,667, meaning that 5th grade students who score 2,297 or higher on ISIP AR will most likely pass STAAR reading tests.

For 6th grade, the prediction band ranges from 2,358 to 2,419. The ISIP AR score at 2,419 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 2,419 will score higher than the STAAR reading cut score 1,718, meaning that 6th grade students who score 2,419 or higher on ISIP AR will most likely pass STAAR Reading tests.

For 7th grade, the prediction band ranges from 2,640 to 2,829. The ISIP AR score at 2,829 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 2,829 will score higher than the STAAR reading cut score 1,753, meaning that 7th grade students who score 2,829 or higher on ISIP AR will most likely pass STAAR reading tests.

For 8th grade, the prediction band ranges from 2,626 to 2,817. The ISIP AR score at 2,817 is the cut score. It is 95 percent certain that a group of students who have an ISIP AR score of 2,817 will score higher than the STAAR reading cut score 1,783, meaning that 8th grade students who score 2,817 or higher on ISIP AR will most likely pass STAAR reading tests.

Conclusions

Overall, it is clear that ISIP reading tests are predictive of STAAR reading tests across grades (Patarapichayatham, Fahle, & Roden, 2013; Patarapichayatham, Fahle, & Roden, 2014; Patarapichayatham, 2015). Knowing the ISIP reading cut scores to predict passing STAAR reading tests is useful for school administrators, superintendents, teachers, and parents for predicting students' performance on STAAR reading tests. Also, teachers can use ISIP cut scores to encourage students to improve their reading ability in order to meet STAAR performance standards.

ISIP reading tests and their associated curriculum definitely can be used to prepare students for the STAAR reading tests. If a student does very well on ISIP reading tests, it is likely that he or she will almost certainly pass STAAR reading tests in spring. To benefit from these results, teachers would ideally begin tracking their students' scores from the beginning of the school year. By comparing a student's score with the ISIP reading cut score, teachers can immediately see how much a student must improve in reading ability in order to meet the ISIP reading cut score and ensure a likely chance of passing the STAAR reading test.

Even though this study suggests that teachers use ISIP reading cut scores to prepare students for STAAR reading tests, it must be understood that complete certainty of passing the STAAR reading test is actually unknown. It must be noted that there are many other factors that may affect students' STAAR reading scores aside from their reading ability. For example, if a

student has a physical issue (e.g., sickness or stress) before or during the STAAR reading test, he or she may or may not pass, despite having met the ISIP cut score.

References

- Patarapichayatham, C., Fahle, W., & Roden, T. R. (2013). ISIP reading versus STAAR reading: The predictability study. Dallas, TX: Istation.
- Patarapichayatham, C., Fahle, W., & Roden, T. R. (2014). Predictability study of ISIP Reading and STAAR Reading: Prediction bands. Dallas, TX: Istation.
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Table 1

Descriptive Statistics of ISIP Reading and STAAR Reading Scale Scores

Grade	n	ISIP Reading		STAAR Reading		Correlations
		Mean	SD	Mean	SD	
3rd	3,397	253.00	22.05	1,438.26	143.58	0.737
4th	3,400	1,958.99	183.54	1,509.61	138.77	0.735
5th	3,556	2,036.32	192.12	1,566.24	137.30	0.706
6th	1,116	2,066.62	228.89	1,574.71	139.10	0.752
7th	730	2,017.96	192.99	1,566.60	92.05	0.549
8th	449	2,087.84	191.12	1,588.16	95.52	0.628

Table 2

STAAR Reading Assessment Performance Standards

Grade	Approaches Grade Level Performance	Meets Grade Level Performance	Masters Grade Level Performance
3rd	1,345	1,468	1,555
4th	1,434	1,550	1,633
5th	1,470	1,582	1,667
6th	1,517	1,629	1,718
7th	1,567	1,674	1,753
8th	1,587	1,700	1,783

Table 3

ISIP Reading Prediction Bands

Grade	Approaches Grade Level Performance	Meets Grade Level Performance	Masters Grade Level Performance
3rd	234–236	259–260	277–278
4th	1,828–1,846	2,030–2,046	2,169–2,196
5th	1,817–1,846	2,077–2,092	2,264–2,297
6th	1,933–1,972	2,176–2,215	2,358–2,419
7th	2,010–2,059	2,378–2,496	2,640–2,829
8th	2,069–2,123	2,397–2,516	2,626–2,817

Table 4

ISIP Reading Cut Scores to Predict Passing STAAR Reading Tests

Grade	Approaches Grade Level Performance	Meets Grade Level Performance	Masters Grade Level Performance
3rd	236	260	278
4th	1,846	2,046	2,196
5th	1,846	2,092	2,297
6th	1,972	2,215	2,419
7th	2,059	2,496	2,829
8th	2,123	2,516	2,817