



education  
analytics

**UNDERSTANDING EDUCATION  
ANALYTICS' LINKING STUDY BETWEEN  
SC READY AND RENNAISSANCE  
LEARNING STAR ASSESSMENT, GRADES  
3-8**

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# OVERVIEW

In the spring of 2023, the South Carolina Education Oversight Committee (SC EOC), in collaboration with the South Carolina Department of Education (SCDE), partnered with Education Analytics (EA) to complete a linking study between the South Carolina College- and Career-Ready Assessment (SC READY) in Mathematics and English Language Arts (ELA) and the Renaissance Learning's STAR Growth assessment in Mathematics and Reading, respectively. Linking studies are used to statistically connect state summative test scores and interim test scores within the same grade level to facilitate comparisons of proficiency status on the two tests. Such linking studies help to answer the question, *what would my students' proficiency status on the spring state test likely be based on how they performed on the STAR assessment?*

The SC EOC enlisted EA to provide updated linked results based on the most current assessment data available (Spring 2023) and validate the results provided by interim assessment vendors, offering an independent evaluation of the alignment between interim assessments and state-level assessments. In cases where an interim vendor's studies are more recent than those presented here or utilize the same assessment year as our own results, **we recommend prioritizing the use of the vendor's results.** This approach ensures that educators and policymakers have access to the most up-to-date and aligned data and resources for making informed decisions regarding student learning and achievement.

In the following sections, we will provide a general overview of the linking study results and guidance on their interpretation, including limitations and cautions associated with linking studies. By providing an overview of EA's linking study results, methods, and considerations, this document aims to facilitate informed decision-making and promote transparency in assessment practices.

## LINKING STUDIES

### *Data & Methods*

Data from students who took both the SC READY and STAR Mathematics and ELA/Reading assessments in Spring 2023 were included in the linking study. Furthermore, only matched students who took the STAR assessments within 30 days of SC READY<sup>1</sup> in Spring 2023 were included. This ensures more comparability in students' exposure to the curriculum when they were tested.

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<sup>1</sup> The SC READY data do not include the actual test administration dates, so this is an approximation based on [SCDE's 2022–23 Assessment Schedule](#).

Linking studies establish the relationship between the two assessments by identifying corresponding percentile ranks across the test scores. Through this process we obtain scores on the spring STAR assessment that correspond to the three SC READY achievement level cut scores (i.e., cut score between Does Not Meet Expectations and Approaches Expectations, cut score between Approaches Expectations and Meets Expectations, and cut score between Meets Expectations and Exceeds Expectations) for mathematics and ELA at grades 3-8.

## *Results*

Tables 1 and 2 present the linking results between SC READY and STAR spring tests for mathematics and ELA, respectively. The top panel shows the ranges of SC READY scale scores at each proficiency level and grade level in 2023. The bottom panel shows the corresponding STAR scores.

Table 8. SC READY and STAR Cut Score Equivalents (Spring): Mathematics

Grade	SC READY			
	Does Not Meet Expectations	Approaches Expectations	Meets Expectations	Exceeds Expectations
3	100-359	360-437	438-542	543-825
4	100-400	401-480	481-562	563-850
5	100-447	448-534	535-621	622-875
6	100-452	453-542	543-626	627-900
7	100-487	488-576	577-648	649-925
8	100-526	527-614	615-682	683-950
Grade	Renaissance STAR			
	Does Not Meet Expectations	Approaches Expectations	Meets Expectations	Exceeds Expectations
3	0-515	516-589	590-664	665-1400
4	0-606	607-677	678-733	734-1400
5	0-625	626-734	735-803	804-1400
6	0-673	674-783	784-847	848-1400
7	0-711	712-822	823-878	879-1400
8	0-738	739-835	836-892	893-1400

Table 9. SC READY and STAR Cut Score Equivalents (Spring): ELA

Grade	SC READY			
	Does Not Meet Expectations	Approaches Expectations	Meets Expectations	Exceeds Expectations
3	100-358	359-451	452-539	540-825
4	100-418	419-508	509-591	592-850
5	100-448	449-556	557-652	653-875
6	100-454	455-574	576-666	667-900
7	100-511	512-614	615-703	704-925
8	100-536	537-641	642-736	737-950
Grade	Renaissance STAR			
	Does Not Meet Expectations	Approaches Expectations	Meets Expectations	Exceeds Expectations
3	0-268	269-398	399-514	515-1400
4	0-331	332-470	471-589	590-1400
5	0-397	398-549	550-703	704-1400
6	0-423	424-621	622-815	816-1400
7	0-500	501-719	720-924	925-1400
8	0-524	525-753	754-1040	1041-1400

Linked STAR test scores were also extended from the spring to the fall and winter terms for the scores reaching the “Meets Expectations” performance level. These scores are summarized in Table 3. Note that these linked scores were calculated based on the mean STAR scores within each term among all South Carolina students who took the STAR test. Therefore, they reflect expected score equivalents **on average** among these students and **should not** be interpreted as accurate estimations for every individual student. The level of error around the fall and the winter scores will be larger than those around the spring scores as a result of extending these analyses to the fall and winter when SC READY is not administered.

Table 12. STAR Cut Score Equivalents

Grade	Mathematics			ELA		
	Fall	Winter	Spring	Fall	Winter	Spring
3	511	555	590	308	359	399
4	604	644	678	385	436	471
5	679	711	735	470	519	550
6	747	770	784	561	598	622
7	784	805	823	646	685	720
8	800	822	836	684	724	754

## Interpretation & Limitations

Classification accuracy statistics are used to evaluate the degree to which the linked scores from the spring STAR assessment to the SC READY achievement level cut scores can be used to accurately classify students’ proficiency status. An evaluation of these diagnostics provides strong evidence of good classification accuracy for using the linked STAR scores to estimate students’ proficiency status on the SC READY assessments at grades 3-8.

While we do see this high level of classification accuracy, it is still important to consider the appropriate uses and limitations of these results. Figure 1 displays a scatterplot of scores for all grade 3 students who took the SC READY and STAR Mathematics tests in Spring 2023. The black dashed line represents the best-fitting curve, which signifies how STAR Mathematics scores correspond to the SC READY Mathematics scores for students **on average**. For example, a score of 438 on the SC READY Mathematics test is the cut score for “Meets Expectations” at grade 3; this corresponds to a STAR Reading score of 590. Yet as with any statistical methods, there is a level of error associated with the results. The narrow black bands plotted around the dashed curve show the 95% confidence intervals around the average, which represent the range of values within which the linked scores could fall.

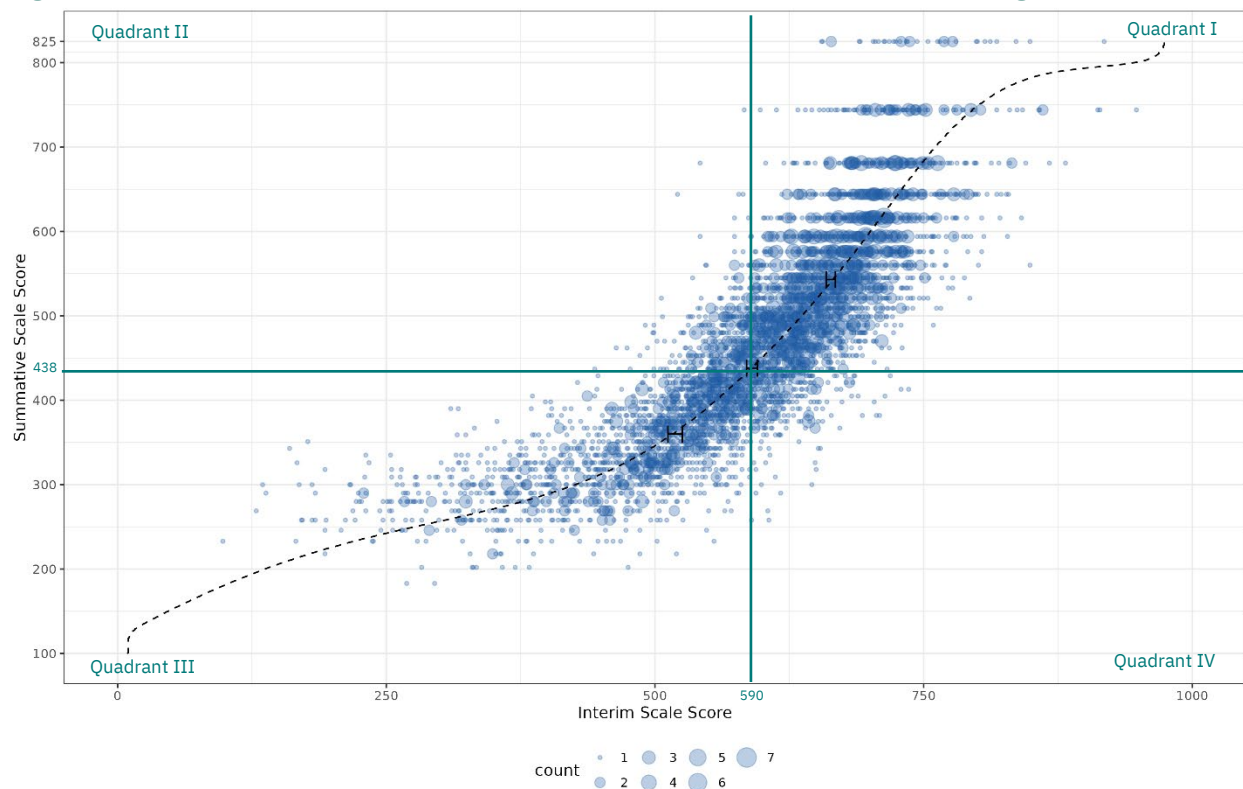
We see from this narrow band and the strong classification accuracy diagnostics that our statistical model is strong. However, it is important to keep in mind that the linked scores are based on a 50% likelihood estimation. This means that not all students who reach a

proficiency cut score on STAR will necessarily reach the associated score on SC READY. The results are more accurate for students on average than as associated with individual students.

Take the example of the SC READY 438 cut score for “Meets Expectations” in grade 3 and the corresponding STAR Mathematics score of 590. This represents how students performed on average. In reality, there is a wide range of STAR scores among students who reached a 438 on SC READY. Not all students who scored 590 and above on the STAR Reading test also scored 438 or higher on the SC READY Mathematics test in Spring 2023. Specifically, students in the bottom right box in Figure 1 (i.e., Quadrant IV) scored lower than 438. Similarly, students who met or exceeded expectations (i.e., scored 438 or above) on the SC READY Mathematics test had a wide range of scores on the STAR Mathematics test. Students in the top left box on the graph (i.e., students in Quadrant II) scored below a 590 on STAR Mathematics.

The interpretation of this estimated average is: 3<sup>rd</sup> grade students who scored 590 on STAR Mathematics have a 50% chance of scoring 438 or higher (i.e., reaching “Meets Expectations”) on the SC READY Mathematics test. We recommend thinking about this scatterplot of the real student test scores when using and interpreting the linking results. Knowing the associated limitations of the results will allow educators to take the appropriate caution when using the results to answer the question, *what would my students’ proficiency status on the spring state test likely be based on how they performed on the STAR assessment?*

Figure 1. Scatterplot of the SC READY and STAR Mathematics, Grade 3, Spring 2023



# CONCLUSIONS

EA conducted linking studies between the spring 2023 SC READY Mathematics and ELA assessments and the Renaissance STAR Mathematics and Reading assessments for the purpose of providing updated results based on the most current assessment data available in order to facilitate interpretation of scores between the two assessments. Once again, we recommend that in cases where interim vendors' studies are more recent or utilize the same assessment year as our own results, that educators prioritize the use of the vendors' results and resources.

Despite good classification accuracy results from this study, there are still important notes of caution to call out when interpreting and using the linked scores. As with any statistical procedure, there is associated error and limitations of the results. Additionally, the two tests are constructed differently with regard to test content, design, and purpose. For example, the STAR Reading test measures students' reading strategies and skills in five domains – “Word Knowledge and Skills, Comprehension Strategies and Constructing Meaning, Analyzing Literary Text, Understanding Author’s Craft, and Analyzing Argument and Evaluating Text” (Renaissance Learning, 2023, p.16). The SC READY ELA assessment is composed of two subtests – writing and reading, and measures student performance on Reading – Literary Text, Reading – Informational Text, Inquiry, and Writing (SCDE, 2022). The statistical adjustments in linking do not adjust for differences in test content.

Therefore, scores on the SC READY and Renaissance STAR assessments should not be used interchangeably. The linked scores facilitate comparisons of proficiency status between two assessments, but do not imply equivalence.

# ADDITIONAL INFORMATION

More information about this study can be found in Education Analytics' February 2024 technical report titled “Linking Study Between South Carolina College- And Career-Ready Assessment (SC Ready) and STAR Assessment, Grades 3-8”. That report can be found at the following link:

# ABOUT EDUCATION ANALYTICS

Professor Robert Meyer formed EA in late 2012 with the objective of conducting research and developing policy and management analytics to support reform and continuous improvement in American education. This institutional mission—to identify ways that analytics can make education systems better—has been central to our work with the federal government, school districts, states, non-profits, and policymakers. EA serves as a partner, and not just a vendor, by engaging in hands-on analytics support and thought partnership around how to address potential shifts in the policy landscape.

EA is a 501(c)(3) non-profit organization headquartered in Madison, Wisconsin, and employs approximately one hundred research scientists, programmers, data engineers, data strategists, and support staff. EA's areas of expertise include student growth metrics, human capital analytics, predictive analytics, technical assistance, data preparation and reporting services, and more. Our deeply knowledgeable and experienced team not only offers a full range of education analytics knowledge to our partners to support new systems, but also strives to co-build each system with stakeholders to match the available data and meet the desired policy requirements.

## REFERENCES

- Renaissance Learning. (2023). *Renaissance Star Assessments™ for Reading Technical Manual*. Wisconsin Rapids, WI: Author.
- South Carolina Department of Education. (2022). *SC READY and SCPASS Score Report User's Guide: For Use with Spring 2022 Score Reports*. Columbia, SC: Author.