

Acadience RAN Preliminary Cut Points for Risk in Kindergarten and First Grade

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Rapid Automatized Naming (RAN) is the “ability to name, as quickly as possible, visually presented familiar symbols, such as digits, letters, colors, and objects” (Georgiou et al., 2013, p. 218). For a measure to be considered a RAN task, the student must be able to accurately identify the items so their rate and automaticity can be assessed. Therefore, the student must be familiar with the items to be named. Initial research indicates that Acadience RAN provides additional information for educators above and beyond the information provided by the Acadience Reading Composite Score and also measures skills not entirely captured by Letter Naming Fluency (Gray et al., 2020).

Acadience RAN measures are brief and individually-administered assessments that have been informed by years of research supported by multiple research teams. Published Acadience RAN measures include: RAN Objects, RAN Letters, and RAN Numbers. RAN assessment begins with the student taking RAN Objects followed by RAN Letters. RAN Numbers is only administered if a student discontinues on RAN Letters. The RAN Total score is created as the sum of RAN Objects and RAN Letters if a student completed RAN Letters, or RAN Objects and RAN Numbers if a student discontinued on RAN Letters. More information about Acadience RAN is available in the *Acadience RAN Assessment Manual*, available for free download from our website at www.acadiencelearning.org. A research version of a RAN Colors measure is also available for download from our website.

The purpose of this document is to report the Acadience RAN preliminary cut points for risk and summarize how they were determined. The cut points for risk aid in the use and interpretation of RAN measures by allowing educators to identify students at increased risk for reading difficulties. While RAN itself is not a teachable skill, the incremental validity of RAN means that it can be useful in identifying students who are at risk for reading difficulties.

Method

Samples

The data used for creating RAN cut points come from several different sources. Beginning-of-year cut points were created using a data set from Acadience Data Management from the beginning and middle of year collected during the 2019–2020 school year. End-of-year data from this source were unavailable because of the lack of assessment that occurred in the spring of 2020 due to the COVID-19 pandemic. The middle- and end-of-year cut points come from two sources of data. One source was Acadience Data Management, with data from the middle and end of year collected during the 2020–2021 school year. The second source of data was from Acadience Learning Online, which included data from the middle and end of year collected during the 2020–2021 school year. All sources had data from kindergarten and first grade. These final two data sets were collected after the onset of the COVID-19 pandemic and so are potentially impacted by learning loss.

Table 1
Sample Characteristics by Data Source

	Acadience Data Management		Acadience Learning Online	
	Kindergarten	First Grade	Kindergarten	First Grade
Students	1,355	1,888	1,297	1,722
Schools	25	27	35	37
Districts	5	4	6	6

Several criteria were used for selecting student data for inclusion in the present study. First, only data for valid RAN scores were included. An Acadience RAN score is considered valid if the student attains a minimum of 90% accuracy on any RAN measure. Thus, scores for any student with more than 5 errors on any measure were excluded. In addition, student data were included when the student had an Acadience Reading Composite Score (RCS) at the relevant time point being examined (e.g., concurrent or predictive) as the RCS served as the criterion measure. Lastly, student data were included only from schools in which RAN was used as a universal screener, meaning that 90% or more of the students in the relevant grade levels had RAN administered at a given benchmark assessment period.

Measures

Across kindergarten and first grade, the present study used two focal assessments: Acadience RAN and Acadience Reading K–6. Acadience RAN was administered at each benchmark assessment period in kindergarten. Details regarding which RAN forms are administered are described above. The RCS was treated as the outcome and was calculated at all time points for both years. In both kindergarten and first grade, the component measures that are used to compute the RCS vary by time of year (see *Table 2*). The measures that contribute to the RCS are weighted so that they contribute approximately equally to the RCS (see the *Acadience Reading K–6 Benchmarks and Composite Score* document at www.acadiencelearning.org).

Table 2
Components of the Reading Composite Score (RCS) by Grade and Time of Year

	Kindergarten			First Grade		
	Beginning	Middle	End	Beginning	Middle	End
FSF	X	X				
LNF	X	X	X	X		
PSF		X	X	X		
NWF CLS		X	X	X	X	
NWF WWR					X	X
ORF Words Correct					X	X
ORF Acc					X	X

Note. FSF = First Sound Fluency. LNF = Letter Naming Fluency. PSF = Phoneme Segmentation Fluency. NWF CLS = Nonsense Word Fluency Correct Letter Sounds. NWF WWR = Nonsense Word Fluency Whole Words Read. ORF Words Correct = Oral Reading Fluency Words Correct. ORF Acc = Oral Reading Fluency Accuracy.

Procedure

The present document details how the preliminary cut points for risk were chosen for use with Acadience RAN. Cut points for risk were created by examining the logistic regression curve for predicting a concurrent and subsequent RCS. This process involves predicting students who are At or Above Benchmark on the RCS from RAN Total. Using this logistic regression, we can examine the probability that a student is meeting reading goals given a specific RAN Total score. The RAN cut point separating At- and Some-Risk was chosen where students had a 40% chance of meeting reading benchmarks. The RAN cut point separating Some- and Low-Risk status corresponds to the 60% point on the curve. This means that students who score precisely at the cut point separating At-Risk and Some-Risk have a 40% chance of meeting later reading goals and students who score precisely at the cut point separating Some- and Low-Risk have a 60% chance of meeting later goals.

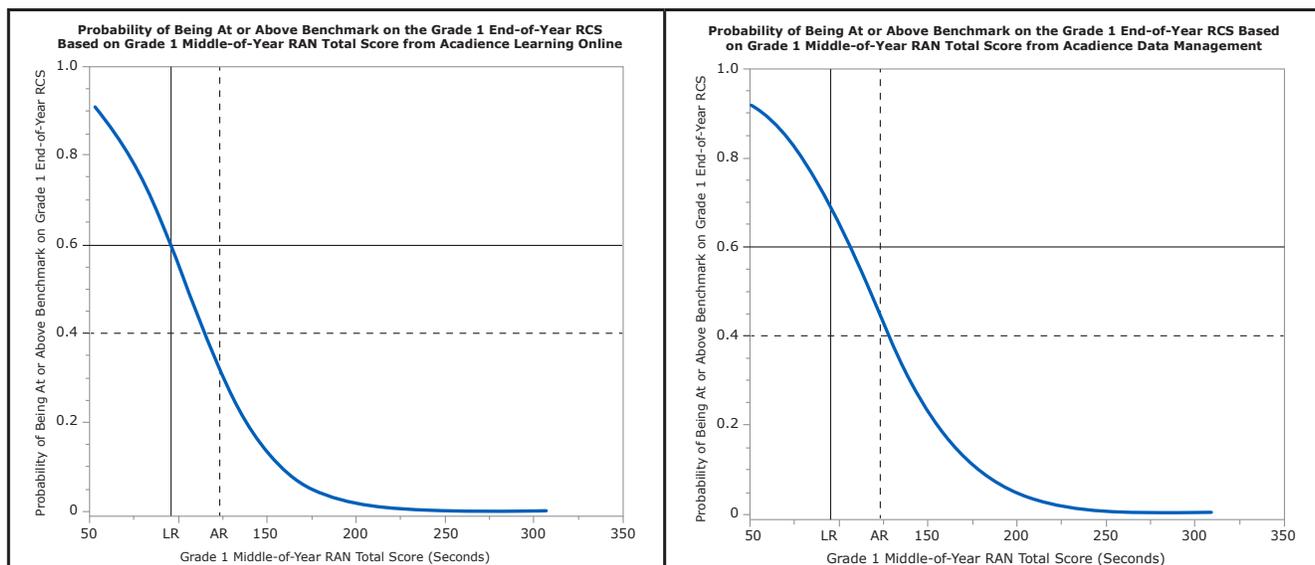
After using the logistic regression curves to create cut points, we further examined the percentage of students in each RAN risk category that were either meeting reading benchmarks (i.e., At or Above Benchmark on the RCS) or were likely in need of intensive support (i.e., Well Below Benchmark on the RCS). These percentages indicate the odds of meeting later goals for all students who fall into each of the three risk categories. Combined together, these two metrics of predicting later reading success provide information about levels of performance on Acadience RAN that correspond to the likelihood or odds of future reading success for a student.

Results

The Acadience RAN preliminary cut points for risk were identified based on the spot of the logistic regression that corresponded to students who had an approximately 40% and 60% chance of meeting later benchmarks. The use of two data sets meant that sometimes there were subtle differences in the logistic regression curves across the two data sets, and so the cut points that best balanced information across data sets were chosen. *Figure 1* illustrates the process of how RAN cut points for the middle of first grade were selected based on the end-of-year first-grade RCS, given different data sources. Overall, it was possible to choose RAN cut points that successfully identify students who are at greater need of reading support. *Table 3* displays the results of this analysis and the RAN cut points for risk.

Figure 1

Logistic Regression Curves Predicting the Probability of Being At or Above Benchmark on the End-of-Year Reading Composite Score (RCS) Based on the Middle-of-Year RAN Total Score in Grade 1 by Data Source



Note. RCS = Reading Composite Score. LR = Low-Risk. AR = At-Risk.

Table 3

RAN Total Score Preliminary Cut Points for Risk by Time of Year and Grade

Grade	Score Level	Beginning of Year	Middle of Year	End of Year
Kindergarten	Low-Risk	195 or less	139 or less	125 or less
	Some-Risk	196 – 229	140 – 169	126 – 153
	At-Risk	230 or greater	170 or greater	154 or greater
First	Low-Risk	138 or less	96 or less	85 or less
	Some-Risk	139 – 164	97 – 123	86 – 110
	At-Risk	165 or greater	124 or greater	111 or greater

Note. Cut points are in seconds and applicable only to the English version of Acadience RAN. The RAN Total is composed of either (a) the sum of RAN Objects time and RAN Letters time or (b) the sum of RAN Objects time and RAN Numbers time.

Additionally, the difference in the percentage of students that are either in need of core support or in need of intensive intervention indicate that the RAN cut points successfully distinguish between students of differing skill levels and support needs. *Table 4* shows the percentage of students who are At or Above Benchmark at either the time point concurrent with RAN administration or at the following time point. There is a clear pattern for those students who are identified as Low-Risk on RAN to have a higher probability of meeting later reading goals or benchmarks. For example, the percentage of students who are Low-Risk on RAN in the middle of kindergarten who go on to be At or Above Benchmark on the RCS at the end of the year (81%) is 2.7 times higher than students who are At-Risk on RAN (30%). Conversely, *Table 5* shows the probability of being Well Below Benchmark on the RCS given concurrently or at the next benchmark assessment after the RAN assessment.

Again, there is clear separation between the RAN risk groups on the probability of being Well Below Benchmark. For example, the percentage of students who are At-Risk on RAN in the beginning of first grade who go on to be Well Below Benchmark on the RCS at the middle of the year (52%) is 8.67 times higher than students who are Low-Risk on RAN (6%).

Discussion

Cut Points and Risk for Reading Difficulties

The cut points for risk for Acadience RAN define the levels of performance indicating risk for later reading difficulties. RAN cut points should be used in conjunction with Acadience Reading Benchmarks to best identify the level of support that each student is likely to need to prevent future reading difficulties. The definition of each risk category is given below.

Low-Risk

Students who score lower than the Low-Risk cut point have a high probability of meeting later reading goals, approximately 80–90%. Students who complete the RAN measure in less time than this cut point have the highest probability of later success and, conversely, the lowest probability of encountering reading difficulties. These students are likely to need core support to remain on track to becoming successful readers.

Some-Risk

RAN scores between the At-Risk and Low-Risk categories are categorized as indicating Some-Risk for reading difficulties. The probability of meeting later reading goals is more difficult to predict, approximately 40–60%. These students may benefit from more targeted reading support in the areas that give them the greatest difficulty. In addition, these students should be monitored regularly to ensure that they receive effective instructional support and remain on track to achieve later reading goals.

At-Risk

Students who take the longest to complete Acadience RAN are At-Risk for later reading difficulties. This category of risk indicates that they are likely to need intensive support to meet future important reading outcomes. Facets of this intensive support may include more sustained, intensive, and individualized instruction along with regular progress monitoring of reading performance.

Table 4*Percentage of Students At or Above Benchmark by RAN Risk Status and Time of Year*

	Percentage of Students <i>At or Above Benchmark</i> on Beginning-of- Year RCS Given Beginning-of- Year RAN Risk Status	Percentage of Students <i>At or Above Benchmark</i> on Middle-of-Year RCS Given Beginning-of- Year RAN Risk Status	Percentage of Students <i>At or Above Benchmark</i> on Middle-of-Year RCS Given Middle-of-Year RAN Risk Status	Percentage of Students <i>At or Above Benchmark</i> on End-of-Year RCS Given Middle-of-Year RAN Risk Status	Percentage of Students <i>At or Above Benchmark</i> on End-of-Year RCS Given End-of-Year RAN Risk Status
Kindergarten RAN					
At-Risk	31%	29%	15%	30%	21%
Some-Risk	45%	43%	36%	53%	48%
Low-Risk	74%	61%	68%	81%	82%
First Grade RAN					
At-Risk	11%	30%	21%	24%	24%
Some-Risk	46%	56%	46%	50%	52%
Low-Risk	73%	85%	80%	82%	78%

Note. RCS = Reading Composite Score.**Table 5***Percentage of Students Well Below Benchmark by RAN Risk Status and Time of Year*

	Percentage of Students <i>Well Below Benchmark</i> on Beginning-of- Year RCS Given Beginning-of- Year RAN Risk Status	Percentage of Students <i>Well Below Benchmark</i> on Middle-of-Year RCS Given Beginning-of- Year RAN Risk Status	Percentage of Students <i>Well Below Benchmark</i> on Middle-of-Year RCS Given Middle-of-Year RAN Risk Status	Percentage of Students <i>Well Below Benchmark</i> on End-of-Year RCS Given Middle-of-Year RAN Risk Status	Percentage of Students <i>Well Below Benchmark</i> on End-of-Year RCS Given End-of-Year RAN Risk Status
Kindergarten RAN					
At-Risk	38%	48%	60%	40%	50%
Some-Risk	28%	38%	35%	20%	22%
Low-Risk	10%	15%	14%	7%	5%
First Grade RAN					
At-Risk	74%	52%	70%	64%	68%
Some-Risk	46%	32%	39%	33%	33%
Low-Risk	11%	6%	11%	9%	12%

Note. RCS = Reading Composite Score.

Using RAN Cut Points for Decision Making

Acadience RAN scores are most effectively used and interpreted in conjunction with the RCS. Students in the Low-Risk category on the RAN Total score are unlikely to need additional support when their scores on the RCS are At or Above Benchmark. Students who fall within the Some-Risk category on the RAN Total score may be at higher risk of reading difficulties, especially if they are Below or Well Below Benchmark on the RCS. Students who are both in the At-Risk and Below or Well Below Benchmark on the RCS are likely to need intensive reading support to meet later goals. Finally, students who are both At-Risk on RAN and Well Below Benchmark on Acadience Reading measures will likely need additional and sustained explicit instruction.

Conclusion

This technical brief described the process of creating cut points for risk for Acadience RAN and their utility in making educational decisions. The Acadience RAN cut points for risk provide categories of performance that correspond to the probability of meeting later reading goals. Students in the At-Risk category of performance on RAN Total had the lowest probability of achieving later reading goals, while those students in the Low-Risk category were typically on track to meet later reading goals. Acadience RAN can augment Acadience Reading K–6 in the prediction of later reading skills by helping inform instructional support decisions for those students who are near the benchmarks and cut points for risk on Acadience Reading K–6. Acadience RAN is another powerful tool educators may use for helping improve students’ educational outcomes.

References

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