Screening Briefs Series

Brief #2: Cut Scores

This brief describes screening within an RTI framework, defines cut scores, and reviews types of cut scores that are typically used for screening assessments. In addition, the brief provides considerations for school staffs relative to setting cut scores.

Schools that are just beginning to implement an RTI framework will be making many decisions on screening practices. The NCRTI has developed a screening tools chart, which can be found at www.rti4success.org/screeningTools. Although the chart does not recommend specific products, it can help educators become informed about the screening tools that are available.

Educators can also learn more about the role of screening in the NCRTI's *Essential Components* document (National Center on Response to Intervention, 2010), http://www.rti4success.org/pdf/rtiessentialcomponents_042710.pdf, and from Module One (Screening) of the NCRTI Implementer Series http://www.rti4success.org/resourcetype/rti-implementer-series-modules.

All of the Screening Briefs in this series are available for download from NCRTI's website, www.rti4success.org.

Universal Screening

Universal screening data can help educators evaluate the strength of their core program and identify students at risk for academic failure. The broad goal of choosing and implementing good screening practices is to ensure that schools have data to allow them to make decisions about instruction based on valid, reliable information. Because screening involves all students, the process must be efficient as well as effective.

Data from screening assessments can be combined with progress monitoring data to evaluate the adequacy of a school's core curriculum and the effectiveness of its instructional strategies. If, for example, 60 percent of the students in the second grade do poorly on the mid-year screening assessment and score below the cut point, school staff might consider looking closely at the appropriateness of the second grade core curriculum and its implementation.

Using screening to identify students at risk of not meeting proficiency on an outcome assessment is equally important. Identifying at-risk students during their first two years in school, and providing them with additional support before they have significant academic problems, increases their chances of establishing and maintaining appropriate levels of academic growth (Compton, Fuchs, Fuchs, & Bryant, 2006).

The Center recommends that universal screening should occur three times per year. At a minimum, screening should occur once per year in order to evaluate program effectiveness, establish local norms and cut scores, and provide data for next year's teachers.

Screening assessments are intended to help determine if a student is at risk; they are not diagnostic. As an example, think of a child who does poorly when tested with an eye chart (a type of screening for vision problems). Further diagnostic testing by an optometrist or ophthalmologist is warranted to confirm or disconfirm the student's need for glasses or other visual aids. Similarly, when a score on a screening assessment indicates that a student may be at risk for not meeting

proficiency on an outcome assessment, a follow-up assessment may help to verify risk and identify specific needs. Additional testing might include diagnostic testing and/or progress monitoring. Some schools use a two-stage screening process—after screening, several weeks are spent monitoring the progress of students who are potentially at risk in order to confirm risk status.

What Is a Cut Score?

Screening assessments identify students as at risk or not at risk for not meeting proficiency on an outcome assessment on the basis of a cut score—i.e., a cut score differentiates students who are at risk for poor academic outcomes from those who are not. Using reading as an example, students whose scores on a screening assessment (e.g., correct words read per minute) are below the set cut score may be at risk for not meeting proficiency on an outcome assessment, and those students whose scores are at or above the cut score are considered at low risk for not meeting proficiency on an outcome assessment (i.e., on track for successful academic outcomes). A high quality screening assessment will include a cut score that accurately classifies students as being at risk or not at risk on a meaningful outcome assessment.

Types of Scores

A *norm-referenced* score compares an individual's performance with the performance of others within a relevant norm group (e.g., other second-grade students or students of the same age). Two commonly reported norm-referenced scores include percentile ranks and standard scores, both of which are useful when attempting to assess students' performance relative to their peers. By using a simple ranking system, percentile ranks provide a more easily decodable system of identifying test takers' standings relative to others taking that test.

In contrast to percentile ranks, *standard scores* are transformed scores expressed in terms of the number of standard deviations from the group mean score. Though they are presented differently, standard scores and percentile ranks are related. As an example, a student achieving a standard score of 60 on an assessment with a mean of 50 and a standard deviation of 10 has scored one standard deviation above the mean. Under normal circumstances, a score that is 1 standard deviation above the mean is ranked at the 84th percentile. Descriptive labels are typically attached to ranges of scores so that individuals scoring within one standard deviation of the mean—on either side of the mean—are usually described as scoring in the average range.

A district that uses a test of early numeracy to identify first-grade students who are at risk for having problems in mathematics might choose the publisher's ranking of the 20th percentile as its cut score, which is based on national, aggregated norms. The school would then identify those students at or below the nationally normed 20th percentile as being potentially at risk and would do additional testing and provide additional support, as needed, for this group of students.

District staff will want to remember that when a district uses cut scores based on national, aggregated norms, these scores will not always align with the resulting percentages for their district. As a result, a cut score at the 20th percentile may identify more or less than 20 percent of their students, depending on the skill level of the class, grade, or school. In this situation, districts might consider choosing a cut score that reflects the performance abilities of students enrolled in their district. This should be done only if there are sufficient data to warrant the change and the school has ready access to trained statisticians who are familiar with test development and cut score selection.

While a *norm-referenced score* is interpreted by comparing it with the scores of the other test takers, the *criterion-referenced score* is interpreted in terms of a set performance standard. In addition, unlike a norm-referenced score that targets a percentage of the population (i.e., the bottom 10 percent), the

criterion-referenced score targets those students who are at or below a particular proficiency skill level based on a broader outcome measure. The criterion-reference score reflects how well a student knows the expected skills or content in a particular curriculum. As an example, students whose scores on the screening assessment are at or above the cut score are likely to demonstrate mastery on an outcome measure such as an end-of-year test or relevant parts of a state assessment. Some examples of screening assessments that use or offer criterion-referenced measures include Dynamic Indicators of Basic Early Literacy Skills (DIBELS), AIMSweb, and the Texas Primary Reading Inventory (TPRI).

States can develop screening measures that are linked to their state assessments. Pennsylvania, for example, has developed a screener (taken four times a year) that predicts student performance on the state assessment. The school administration and faculty know which students are likely to struggle to meet end-of-year standards and can therefore provide focused instruction to groups, individuals, grades, or classes, depending on the students' needs.

In summary, the major difference between the two types of scores is that a norm-referenced score is interpreted by comparing it with the scores of the other test takers, and the criterion-referenced score is interpreted in terms of a set performance standard.

Setting Cut Scores

Many published screening tools provide established cut scores. You can see examples of these tools on the NCRTI Screening Tools Chart, at www.rti4success.org/screeningTools. The cut scores that are provided by publishers are based on national norms. Schools and districts might want to establish cut scores based on local norms if the national norms do not seem to fit their student population. However, this process requires a sufficient sample of students and someone with statistical expertise to conduct the analysis.

Schools and districts must also consider the value of having a consistent cut score across the district so that comparisons can be made among schools. District-wide cut scores are also advantageous because they allow district officials to identify educational trends and compare the effects of intervention implementation against non-intervention schools.

The perfect cut score would correctly identify all of the truly at-risk students without misidentifying anyone, but because no screening tool is a perfect predictor of student risk, test publishers must strike a balance between two approaches:

A. Choosing a more *stringent cut score* (i.e., where more students would be identified as being at risk) will result in all or nearly all students who are at risk being identified as at risk. Adopting this approach also increases the likelihood of incorrectly identifying students as at risk, and this results in increased costs for resources. These students will need additional testing and progress monitoring, and some may receive unnecessary interventions.

B. Alternatively, choosing a more *lenient cut score* (i.e., where fewer students would be identified as at risk) will not include as many students who are not actually at risk but may result in missing a number of students who *are* truly at risk. An advantage of choosing a more lenient cut score is that fewer resources will be used for additional testing, progress monitoring, and unnecessary interventions. On the other hand, the likelihood of not identifying some truly at-risk students becomes greater as the cut score becomes more lenient. If these students do not receive extra support when it is needed, their prospects for success with long-term academic outcomes and state tests are diminished. Given that the goal of RTI is to prevent poor outcomes for students, most screening assessments use cut scores that are restrictive and over-identify students who are at risk.

Predicting Resource Needs

Considerations for changes in cut scores often relate to resource availability and student achievement levels—for example, a low performing district will produce considerably more identified students than a high performing district for a given cut score. Budget cuts may also create economic crises that restrict the educational opportunities afforded to students.

When educational resources are scarce, school officials sometimes set priorities for providing interventions for students who are most at risk for academic failure. To predict the resources that are needed, school officials must identify the prevalence of at-risk students within the school (i.e., the percentage of total students that are likely to need support). This prevalence rate is calculated by dividing the number of identified at-risk students by the total number of students tested.

With the prevalence rate identified, practitioners can determine the number of students who will require academic interventions for the current year. Using this information, staff members may also estimate resource needs for the near future.

Districts that are facing changes in resources or achievement levels may find that they must adjust the number of students receiving supplemental supports to balance resources, adjust to student needs, or meet educational outcomes. When considering adjustments in cut scores, however, schools and districts should understand that doing so could alter test-specific properties and cause unintended consequences in classification rates. Altering a cut score could, for example, result in a higher than acceptable number of incorrect classifications. Practitioners who wish to modify site-specific needs should enlist the help of the testing companies that make the instrument or a trained assessment specialist.

In conclusion, cut scores should be given thoughtful consideration because they impact both the number of students receiving extra support and the use of resources. It is a balancing act: schools must try to help all students who are at risk without depleting their resources. It is important that practitioners understand how cut scores relate to the decisions they make regarding their screening practices.

References

Compton, D. L., Fuchs, D., Fuchs, L. S., & Bryant, J. D. (2006). Selecting at-risk readers in first grade for early intervention: A two-year longitudinal study of decision rules and procedures. Journal of Educational Psychology, 98, 394–409.

National Center on Response to Intervention. (2010). Essential components of RTI—A closer look at response to intervention. Washington, DC: U.S. Department of Education, Office of Special Education Programs, National Center on Response to Intervention. Retrieved January 25, 2012, from http://www.rti4success.org/pdf/rtiessentialcomponents_042710.pdf

About the National Center on Response to Intervention

Through funding from the U.S. Department of Education's Office of Special Education Programs, the American Institutes for Research and researchers from Vanderbilt University and the University of Kansas have established the National Center on Response to Intervention. The Center provides technical assistance to states and districts and builds the capacity of states to assist districts in implementing proven response to intervention frameworks.

National Center on Response to Intervention
http://www.rti4success.org

National Center on Response to Intervention

1000 Thomas Jefferson Street, NW
Washington, DC 20007
Phone: 877–784–4255
Fax: 202–403–6844
Web: http://www.rti4success.org

This document was produced under U.S. Department of Education, Office of Special Education Programs Grant No. H326E070004 to American Institutes for Research. Grace Zamora Durán and Tina Diamond served as the OSEP project officers. The views expressed herein do not necessarily represent the positions or policies of the Department of Education. No official endorsement by the U.S. Department of Education of any product, commodity, service or enterprise mentioned in this publication is intended or should be inferred. This product is public domain. Authorization to reproduce it in whole or in part is granted. While permission to reprint this publication is not necessary, the citation should be: National Center on Response to Intervention (January 2013). *Screening Briefs Series– Brief #2: Cut Scores.* Washington, DC: U.S. Department of Education, Office of Special Education Programs, National Center on Response to Intervention.

Publication Number 2317b_12/12

AIR®
AMERICAN INSTITUTES FOR RESEARCH®

IDEAs that Work
U.S. Office of Special Education Programs