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Psychometric Evidence for the 2019 MAP® Growth™ Grade-Level Test Guidance

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1. Introduction

The purpose of this document is to present psychometric evidence of the transition guidelines from NWEA® for MAP® Growth™ K–2 and 2–5 in Reading and Mathematics. These recommendations are based on the range of performance that would likely produce an appropriate percent correct score and low standard error of measurement (SEM) for each test. The following table summarizes the guidelines that are fully described in the document *2019 MAP Growth Grade-Level Test Guidance*.

Grade	Recommended Test and Points of Consideration
K	**MAP Growth K–2**
1	**MAP Growth K–2**
2	**MAP Growth 2–5 (with some exceptions)** **Exceptions** • If a student has a previous MAP Growth 2–5 RIT in Reading of 170 or lower, the student should take the MAP Growth K–2. • If a student has a previous MAP Growth 2–5 RIT in Mathematics of 170 or lower, the student should take the MAP Growth K–2.
3–5	**MAP Growth 2–5**
***Note:* These exceptions apply to ALL grades.** • The above recommendations may be adjusted for students with IEPs, 504s, or have other special needs such as ELL. • State or district policy may supersede the above recommendations	

2. Psychometric Evidence for Transition Guidance

NWEA's transition guidance involves two criteria for a good adaptive test: the range of percent-correct scores and the magnitude of SEMs. Ideally, a good adaptive assessment provides an equal amount of information as to what the student knows and does not yet know, so the goal on an adaptive test is for students to answer about 50% of the items correctly. In general, students should answer between 40% and 60% of the items on an adaptive assessment correctly. A good adaptive assessment should also consistently result in low SEMs for every student. The following analysis evaluated the range of RIT scores where these criteria were likely to be satisfied.

2.1. MAP Growth Reading

Figure 2.1 depicts the percent-correct scores by Rasch Unit (RIT) scores for Grade 2 students taking the MAP Growth K–2 and 2–5 Reading assessments for use with the Common Core State Standards (CCSS; National Governors Association Center for Best Practices & Council of Chief State School Officers [CCSSO], 2010)[1].

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As shown in Figure 2.1, the percent-correct scores for MAP Growth Reading K–2 has a point of inflection (i.e., a change in the direction of the curve) near a RIT score of 190. After that point, percent-correct scores show a rapid increase and eventually deviate substantially from the target range of 40–60% correct. Results indicate that 20% of Grade 2 students taking the K–2 assessment answered more than 60% of the items correctly, while only 1% of Grade 2 students taking MAP Growth 2–5 exceeded that threshold. Therefore, the MAP Growth 2–5 assessment does a better job of keeping percent-correct scores below the preferred upper bound.

Figure 2.2 depicts the SEM for Grade 2 students for the MAP Growth K–2 and 2–5 Reading assessments. SEMs at the low end of the scale tend to be smaller in magnitude on the K–2 assessment than the 2–5 assessment, which indicates that the K–2 assessment does a better job of matching the difficulty of the assessment to the student's ability. The opposite pattern is evident at the upper end of scale, where SEMs are larger for the K–2 assessment than the 2–5 assessment. In particular, SEMs increase substantially for RIT scores above 190 on the K–2 assessment. Thus, at the upper end of the scale, the 2–5 assessment does a better job of matching the difficulty of the assessment to a student's ability and producing more precise measurement.

Figure 2.1. MAP Growth Reading: Percent Correct by RIT Score for Grade 2 Students

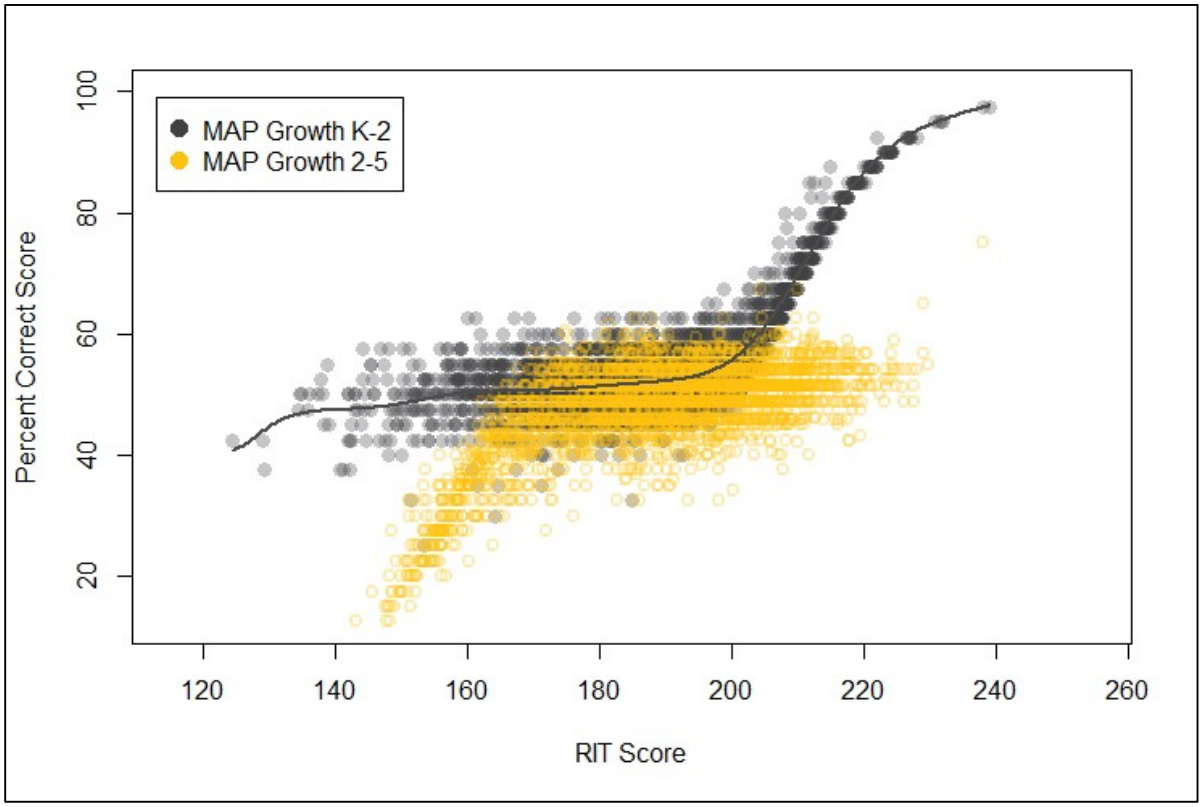
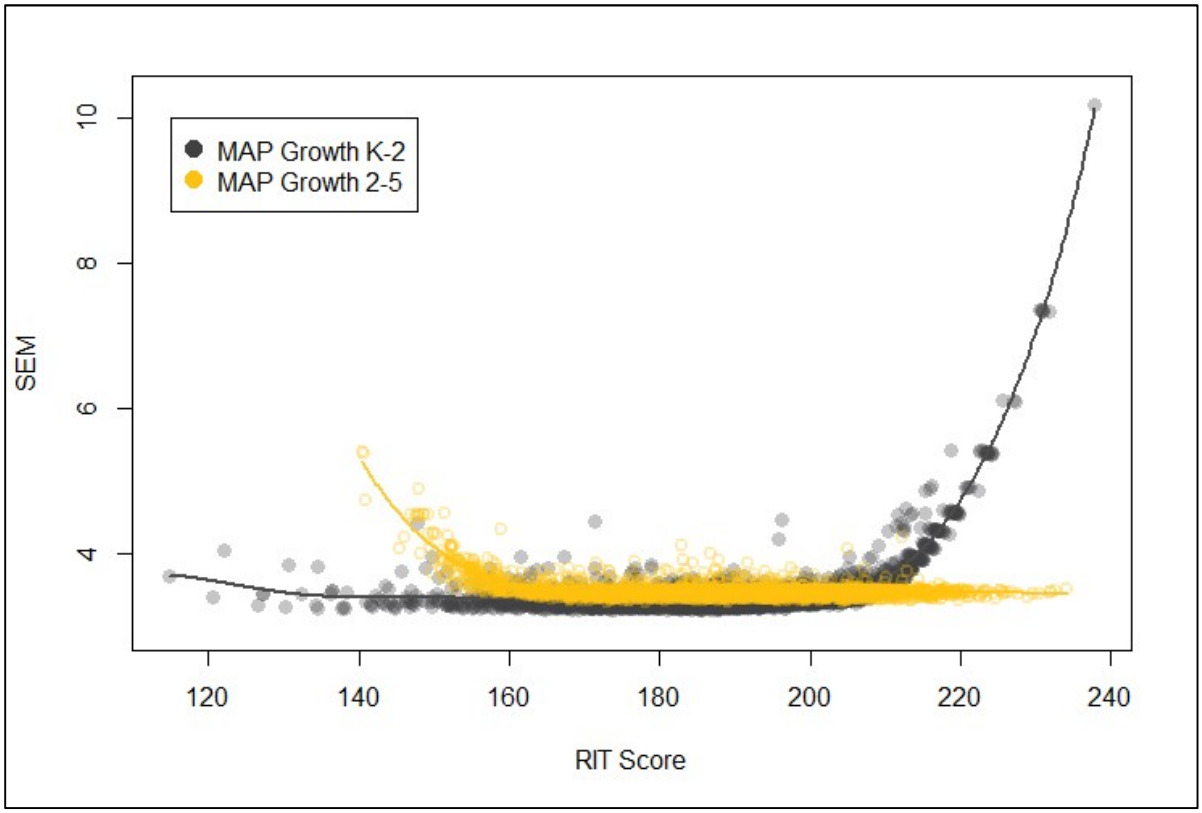


Figure 2.2. MAP Growth Reading: SEM by RIT Score for Grade 2 Students



2.2. MAP Growth Mathematics

Reading fluency has less of an impact in mathematics for transitioning students. This is not unexpected given the lower reading demand associated with most mathematics test items.

Figure 2.3 presents the percent-correct scores by RIT scores for the CCSS-aligned MAP Growth K–2 and 2–5 Mathematics assessments. The pattern is similar to the one for Reading, with the percent-correct scores for the K–2 assessment rapidly increasing at the high end of the scale. The point of inflection occurs later for Mathematics than it does for Reading, near the recommended transition score of 200. After that point, percent correct scores begin a sharp increase for the K–2 assessment.

Figure 2.4 depicts the SEM for Grade 2 students for the MAP Growth K–2 and 2–5 Mathematics assessments. The SEMs for Grade 2 students also indicate that the K–2 Mathematics assessment has more precise measurement at the low end of the scale, whereas the 2–5 assessment has more precise measurement at the high end of the scale. Moreover, SEMs are uniformly lower across the range of the scale for the 2–5 assessment, and they do not show the rapid increase in values that characterizes values at the high end of the scale for the K–2 assessment.

Figure 2.3. MAP Growth Mathematics: Percent Correct by RIT Score for Grade 2 Students

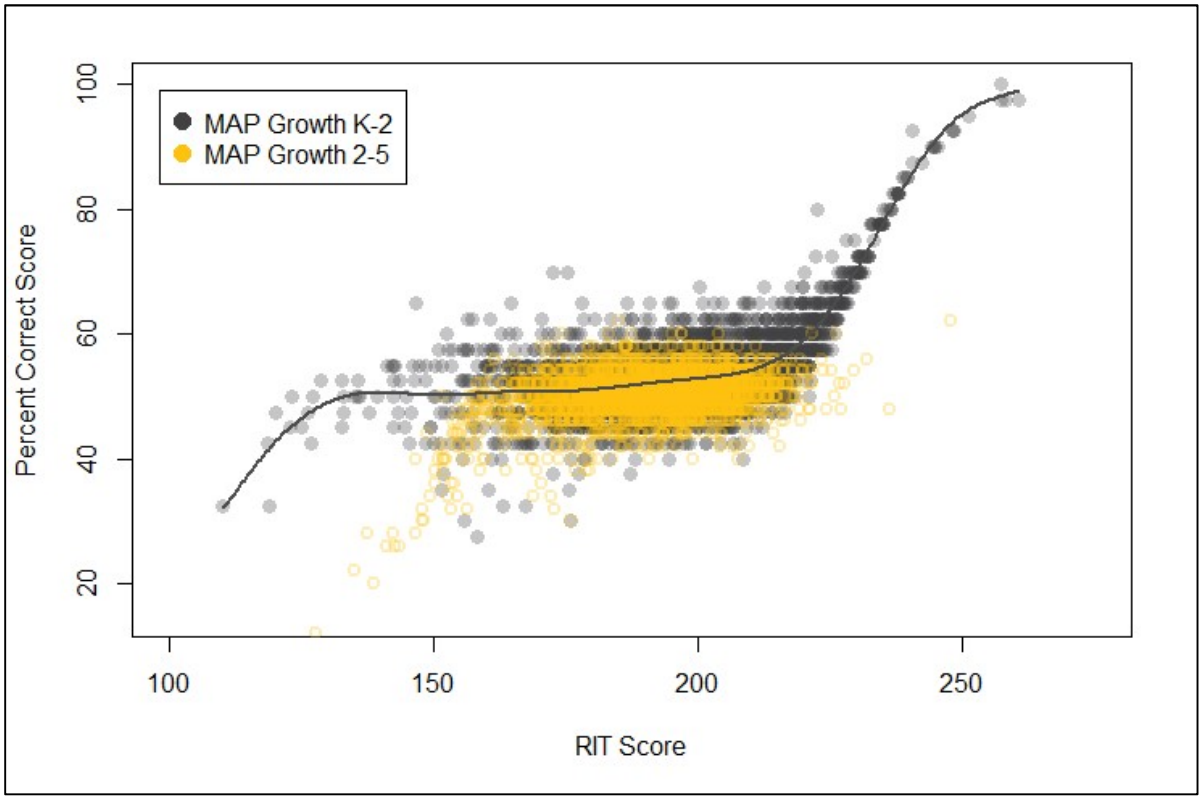
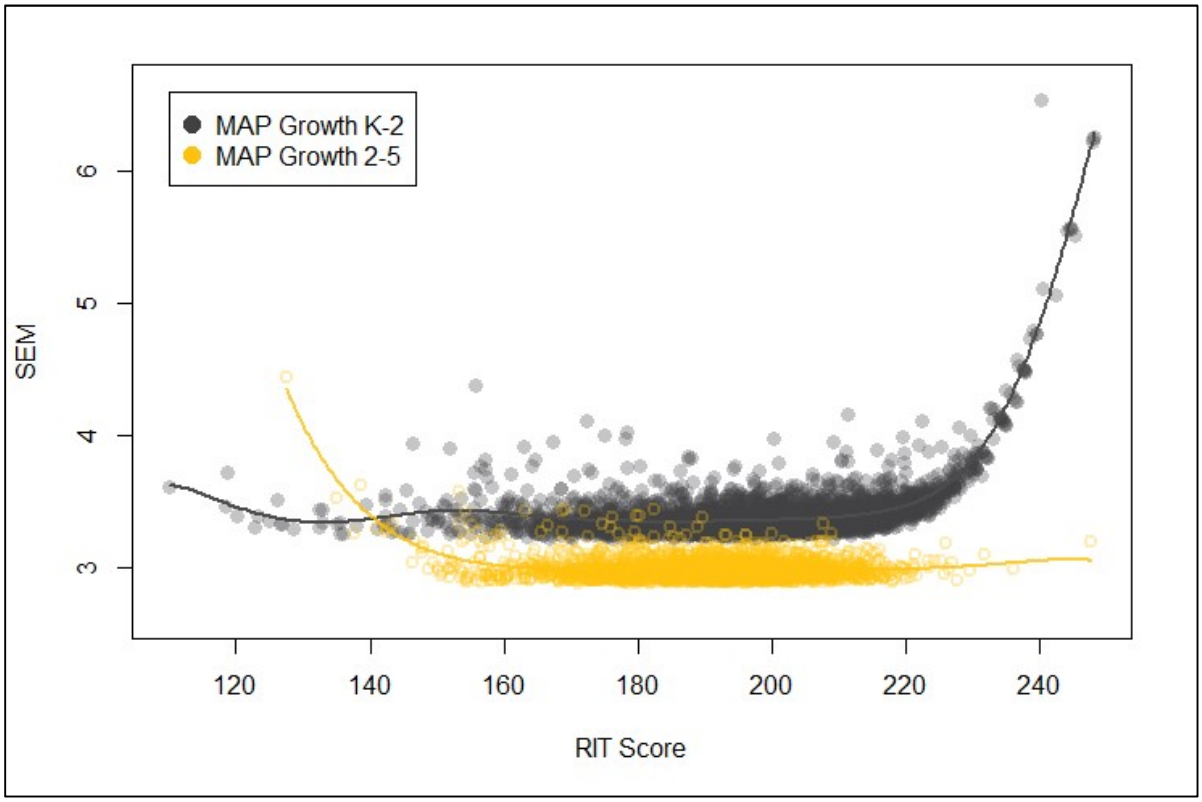


Figure 2.4. MAP Growth Mathematics: SEM by RIT Score for Grade 2 Students



3. Conclusion

NWEA's MAP Growth K–2 and 2–5 transition guidance is designed to satisfy two criteria for a good adaptive test: Percent-correct scores should be between 40% and 60% across the entire scale, and the SEM should be of a consistently low value across the entire scale. For Reading, students should transition to the 2–5 assessment if they have a prior RIT score of 190 on the K–2 assessment or if other evidence suggests that a student will be an independent reader by the end of the grade. For Mathematics, students should transition to the 2–5 assessment if they have a prior RIT score of 200 on the K–2 assessment, or if other evidence suggests that a student will be an independent reader by the end of the grade. For both content areas, if a student has a prior RIT score of 170 or less on the 2–5 assessment or if other evidence suggests the student is not likely to be independent reader by the end of the grade, the student should take the K–2 assessment.

Data indicate that some students experience a drop in scores between spring and fall, some of which NWEA attributes to summer loss when students remain in the same test. However, a greater percentage of students experience a drop in scores when transitioning between MAP Growth K–2 and 2–5 and at a greater magnitude than would normally be attributed to summer loss. Transitioning based on the provided guidelines should reduce both the percentage of those students demonstrating a score drop and the magnitude of the drop. It will also provide a better measure of student performance for most students.

4. References

National Governors Association Center for Best Practices & Council of Chief State School Officers (CCSSO). (2010). *Common core state standards*. Washington, DC: Authors.