

Linking the Mississippi Assessment Program to NWEA MAP Growth Tests^{*}

^{*}As of June 2017 Measures of Academic Progress® (MAP®) is known as MAP® Growth™.

February 2017

Introduction

Northwest Evaluation Association™ (NWEA™) is committed to providing partners with useful tools to help make inferences from the Measures of Academic Progress® (MAP®) interim assessment scores. One important tool is the concordance table between MAP and state summative assessments. Concordance tables have been used for decades to relate scores on different tests measuring similar but distinct constructs. These tables, typically derived from statistical linking procedures, provide a direct link between scores on different tests and serve various purposes. Aside from describing how a score on one test relates to performance on another test, they can also be used to identify benchmark scores on one test corresponding to performance categories on another test, or to maintain continuity of scores on a test after the test is redesigned or changed. Concordance tables are helpful for educators, parents, administrators, researchers, and policy makers to evaluate and formulate academic standing and growth.

Recently, NWEA completed a concordance study to connect the scales of the Mississippi Assessment Program English language arts (ELA) and Mathematics with those of the MAP Reading and MAP for Mathematics assessments. In this report, we present the 2nd through 8th grade cut scores on MAP reading and mathematics scales that correspond to the 2016-2017 benchmarks on the Mississippi Assessment Program ELA and math tests. Information about the consistency rate of classification based on the estimated MAP cut scores is also provided, along with a series of tables that predict the probability of receiving a Level 3 (i.e., “Pass”) or higher performance designation on the Mississippi Assessment Program, based on the observed MAP scores taken during the same school year. A detailed description of the data and analysis method used in this study is provided in the Appendix.

Overview of Assessments

Mississippi Assessment Program includes a series of achievement tests aligned to the Mississippi College-and Career-Readiness Standards in ELA, mathematics, and social studies. Mississippi Assessment Program tests can be delivered online or in the paper-and-pencil form. For each grade and subject, there are four cut scores that distinguish between performance levels: Level 1: *Minimal*, Level 2: *Basic*, Level 3: *Pass*, Level 4: *Proficient*, and Level 5: *Advanced*. The Level 3 cut score demarks the minimum level of performance considered to “pass” for accountability purposes.

MAP tests are vertically scaled interim assessments that are administered in the form of a computerized adaptive test (CAT). MAP tests are constructed to measure student achievement from Grades K to 12 in math, reading, language usage, and science and are aligned to the

Mississippi state standards. Like Mississippi Assessment Program, MAP assessments are vertically scaled across grades, a feature that supports direct measurement of academic growth and change. MAP scores are reported on a **Rasch Unit (RIT)** scale with a range from 100 to 350. Each subject has its own RIT scale.

To aid interpretation of MAP scores, NWEA periodically conducts norming studies of student and school performance on MAP. For example, the 2015 RIT Scale norming study (Thum & Hauser, 2015) employed multi-level growth models on nearly 500,000 longitudinal test scores from over 100,000 students that were weighted to create large, nationally representative norms for math, reading, language usage, and general science.

Estimated MAP Cut Scores Associated with Mississippi Assessment Program Readiness Levels

Tables 1 to 4 report the Mississippi Assessment Program scaled scores associated with each of the five performance levels, as well as the estimated score range on the MAP tests associated with each Mississippi Assessment Program performance level. Specifically, Tables 1 and 2 apply to MAP scores obtained during the spring testing season for reading and math, respectively. Tables 3 and 4 apply to MAP tests taken in a prior testing season (fall or winter) for reading and math, respectively. The tables also report the percentile rank (based on the *NWEA 2015 MAP Norms*) associated with each estimated MAP cut score. The MAP cut scores can be used to predict students' most probable Mississippi Assessment Program performance level, based on their observed MAP scores. For example, a 5th grade student who obtained a MAP math score of 225 in the spring testing season is likely to be at the very high end of Level 3 (Pass) on the Mississippi Assessment Program taken during that same testing season (see Table 2). Similarly, a 3rd grade student who obtained a MAP reading score of 220 in the fall testing season is likely to be at Level 5 (Advanced) on the Mississippi Assessment Program taken in the spring of 3rd grade (see Table 3).

TABLE 1. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN MISSISSIPPI ASSESSMENT PROGRAM ELA AND MAP READING (WHEN MAP IS TAKEN IN SPRING)

MISSISSIPPI ASSESSMENT PROGRAM										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
3	301-334		335-349		350-364		365-386		387-399	
4	401-428		429-449		450-464		465-487		488-499	
5	501-538		539-549		550-564		565-581		582-599	
6	601-635		636-649		650-664		665-678		679-699	
7	701-737		738-749		750-764		765-775		776-799	
8	801-841		842-849		850-864		865-879		880-899	

MAP										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
2	100-169	1-10	170-184	11-39	185-196	40-69	197-210	70-92	211-350	93-99
3	100-179	1-10	180-194	11-39	195-206	40-69	207-220	70-92	221-350	93-99
4	100-186	1-9	187-202	10-40	203-213	41-69	214-228	70-93	229-350	94-99
5	100-194	1-12	195-205	13-33	206-218	34-67	219-231	68-90	232-350	91-99
6	100-199	1-13	200-212	14-41	213-222	42-67	223-232	68-87	233-350	88-99
7	100-196	1-7	197-212	8-35	213-226	36-70	227-235	71-87	236-350	88-99
8	100-203	1-14	204-213	15-33	214-227	34-68	228-239	69-89	240-350	90-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least “proficient” for accountability purposes.

3. High-lighted text denotes Grade 2 benchmarks are extrapolated from Grade 3 cut scores.

TABLE 2. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN MISSISSIPPI ASSESSMENT PROGRAM AND MAP MATH (WHEN MAP IS TAKEN IN SPRING)

MISSISSIPPI ASSESSMENT PROGRAM										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
3	301-332		333-349		350-364		365-383		384-399	
4	401-435		436-449		450-464		465-483		484-499	
5	501-539		540-549		550-564		565-578		579-599	
6	601-635		636-649		650-664		665-686		687-699	
7	701-735		736-749		750-764		765-792		793-799	
8	801-837		838-849		850-864		865-888		889-899	

MAP										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
2	100-170	1-5	171-184	6-28	185-193	29-54	194-204	55-81	205-350	82-99
3	100-181	1-5	182-195	6-28	196-205	29-56	206-216	57-82	217-350	83-99
4	100-192	1-8	193-205	9-29	206-216	30-57	217-227	58-82	228-350	83-99
5	100-195	1-5	196-209	6-23	210-226	24-62	227-237	63-84	238-350	85-99
6	100-199	1-6	200-216	6-29	217-229	30-59	230-243	60-86	244-350	87-99
7	100-198	1-4	199-218	5-28	219-232	29-58	233-249	59-88	250-350	89-99
8	100-205	1-9	206-223	10-34	224-238	35-65	239-252	66-87	253-350	88-99

Notes. 1. %ile=percentile.
 2. Bolded numbers indicate the cut scores considered to be at least “proficient” for accountability purposes.
 3. High-lighted text denotes Grade 2 benchmarks are extrapolated from Grade 3 cut scores.

TABLE 3. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN MISSISSIPPI ASSESSMENT PROGRAM ELA AND MAP READING (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING MISSISSIPPI ASSESSMENT PROGRAM TESTS)

MISSISSIPPI ASSESSMENT PROGRAM										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
3	301-334		335-349		350-364		365-386		387-399	
4	401-428		429-449		450-464		465-487		488-499	
5	501-538		539-549		550-564		565-581		582-599	
6	601-635		636-649		650-664		665-678		679-699	
7	701-737		738-749		750-764		765-775		776-799	
8	801-841		842-849		850-864		865-879		880-899	

MAP FALL										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
2	100-151	1-6	152-169	7-36	170-184	37-73	185-200	74-95	201-350	95-99
3	100-165	1-7	166-183	8-38	184-197	39-71	198-214	72-95	215-350	95-99
4	100-175	1-7	176-194	8-40	195-206	41-70	207-224	71-95	225-350	96-99
5	100-185	1-9	186-198	10-31	199-213	32-69	214-228	70-93	229-350	94-99
6	100-192	1-10	193-207	11-40	208-218	41-69	219-230	70-90	231-350	91-99
7	100-189	1-5	190-208	5-34	209-223	35-72	224-233	73-89	234-350	90-99
8	100-198	1-11	199-209	12-31	210-225	32-70	226-237	71-90	238-350	91-99

MAP WINTER										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
2	100-163	1-8	164-179	9-37	180-192	38-71	193-207	72-94*	208-350	94*-99
3	100-175	1-9	176-191	10-39	192-204	40-72	205-218	73-93	219-350	94-99
4	100-182	1-7	183-199	8-39	200-211	40-70	212-227	71-94	228-350	95-99
5	100-191	1-10	192-203	11-33	204-216	34-67	217-230	68-92	231-350	93-99
6	100-196	1-11	197-210	12-39	211-221	40-69	222-231	70-88	232-350	89-99
7	100-194	1-6	195-210	7-33	211-225	34-71	226-234	72-87	235-350	88-99
8	100-201	1-12	202-212	13-33	213-226	34-68	227-238	69-89	239-350	90-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least “proficient” for accountability purposes.

3. High-lighted text denotes Grade 2 benchmarks are extrapolated from Grade 3 cut scores.

4. * reflects occasional departure from one-to-one correspondence between RITs and percentiles due to the larger range of the RIT scale relative to the percentile scale.

TABLE 4. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN MISSISSIPPI ASSESSMENT PROGRAM AND MAP MATH (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING MISSISSIPPI ASSESSMENT PROGRAM TESTS)

MISSISSIPPI ASSESSMENT PROGRAM										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
3	301-332		333-349		350-364		365-383		384-399	
4	401-435		436-449		450-464		465-483		484-499	
5	501-539		540-549		550-564		565-578		579-599	
6	601-635		636-649		650-664		665-686		687-699	
7	701-735		736-749		750-764		765-792		793-799	
8	801-837		838-849		850-864		865-888		889-899	

MAP FALL										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
2	100-152	1-3	153-168	3-26	169-178	27-54	179-190	55-84	191-350	85-99
3	100-166	1-3	167-181	4-24	182-192	25-56	193-204	57-85	205-350	86-99
4	100-180	1-5	181-193	6-26	194-205	27-60	206-216	61-85	217-350	86-99
5	100-185	1-3	186-199	4-20	200-216	21-63	217-227	64-86	228-350	87-99
6	100-191	1-4	192-208	5-27	209-221	28-59	222-236	60-88	237-350	89-99
7	100-192	1-3	193-212	3-27	213-226	28-59	227-243	60-89	244-350	90-99
8	100-200	1-7	201-218	8-33	219-234	34-67	235-248	68-89	249-350	90-99

MAP WINTER										
Grade	Level 1		Level 2		Level 3		Level 4		Level 5	
	<i>Minimal</i>		<i>Basic</i>		<i>Pass</i>		<i>Proficient</i>		<i>Advanced</i>	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
2	100-163	1-4	164-178	4-27	179-187	28-53	188-199	54-84	200-350	85-99
3	100-175	1-4	176-190	5-28	191-200	29-56	201-211	57-84	212-350	85-99
4	100-187	1-6	188-200	7-28	201-211	29-57	212-222	58-83	223-350	84-99
5	100-191	1-4	192-205	5-22	206-222	23-63	223-233	64-85	234-350	86-99
6	100-196	1-5	197-213	6-29	214-226	30-60	227-240	61-87	241-350	88-99
7	100-196	1-4	197-216	4-28	217-230	29-60	231-247	61-89	248-350	90-99
8	100-203	1-8	204-221	8-33	222-236	34-65	237-250	66-87	251-350	88-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least “proficient” for accountability purposes.

3. High-lighted text denotes Grade 2 benchmarks are extrapolated from Grade 3 cut scores.

Consistency Rate of Classification

Consistency rate of classification (Pommerich, Hanson, Harris, & Scoring, 2004), expressed in the form of a rate between 0 and 1, provides a means to measure the departure from equity for concordances (Hanson et al., 2001). This index can also be used as an indicator for the predictive validity of the MAP tests, i.e., how accurately the MAP scores can predict a student’s proficiency status in the Mississippi Assessment Program test. For each pair of concordant scores, a classification is considered consistent if the examinee is classified into the same performance category regardless of the test used for making a decision. Consistency rate provided in this report can be calculated as, for the “Pass” performance category concordant scores, the percentage of examinees who score at or above both concordant scores plus the percentage of examinees who score below both concordant scores on each test. Higher consistency rate indicates stronger congruence between Mississippi Assessment Program and MAP cut scores. The results in Table 5 demonstrate that MAP reading scores can consistently classify students’ proficiency (Level 3 or higher) status on Mississippi Assessment Program ELA test 81-86% of the time, and MAP math scores can consistently classify students on Mississippi Assessment Program math test 83-86% of the time. Those numbers are high suggesting that both MAP reading and math tests are great predictors of the students’ proficiency status on the Mississippi Assessment Program tests.

TABLE 5. CONSISTENCY RATE OF CLASSIFICATION FOR MAP AND MISSISSIPPI ASSESSMENT PROGRAM LEVEL 3 EQUIPERCENTILE CONCORDANCES

Grade	ELA/Reading			Math		
	Consistency Rate	False		Consistency Rate	False	
		Positives	Negatives		Positives	Negatives
3	0.83	0.09	0.08	0.85	0.08	0.07
4	0.81	0.09	0.10	0.86	0.07	0.07
5	0.86	0.07	0.07	0.86	0.07	0.07
6	0.86	0.07	0.07	0.86	0.07	0.07
7	0.84	0.09	0.07	0.83	0.08	0.09
8	0.84	0.09	0.07	0.85	0.09	0.06

Proficiency Projection

Proficiency projection tells how likely a student is classified as “Pass” on Mississippi Assessment Program tests based on his/her observed MAP scores. The conditional growth norms

provided in the 2015 MAP Norms were used to calculate this information (Thum & Hauser, 2015). The results of proficiency projection and corresponding probability of achieving “Pass” on the Mississippi Assessment Program tests are presented in Tables 6 to 8. These tables estimate the probability of scoring at Level 3 or above on Mississippi Assessment Program in the spring and the prior fall or winter testing season. For example, if a 3rd grade student obtained a MAP math score of 190 in the fall, the probability of obtaining a Level 3 or higher Mississippi Assessment Program score in the spring of 3rd grade is 76%. Table 6 presents the estimated probability of meeting Level 5 benchmark when MAP is taken in the spring, whereas Tables 7 and 8 present the estimated probability of meeting Level 3 benchmark when MAP is taken in the fall or winter prior to taking the Mississippi Assessment Program tests.

TABLE 6. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING MISSISSIPPI ASSESSMENT PROGRAM LEVEL 3 (PASS) WHEN MAP IS TAKEN IN THE SPRING

Grade	ELA/Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
2	5	164	185	No	<0.01	5	170	185	No	<0.01
	10	169	185	No	<0.01	10	175	185	No	<0.01
	15	173	185	No	<0.01	15	178	185	No	0.01
	20	176	185	No	<0.01	20	181	185	No	0.08
	25	178	185	No	0.01	25	183	185	No	0.25
	30	181	185	No	0.11	30	185	185	Yes	0.50
	35	183	185	No	0.27	35	187	185	Yes	0.75
	40	185	185	Yes	0.50	40	189	185	Yes	0.92
	45	187	185	Yes	0.73	45	190	185	Yes	0.96
	50	189	185	Yes	0.89	50	192	185	Yes	0.99
	55	191	185	Yes	0.97	55	194	185	Yes	>0.99
	60	193	185	Yes	0.99	60	196	185	Yes	>0.99
	65	195	185	Yes	>0.99	65	197	185	Yes	>0.99
	70	197	185	Yes	>0.99	70	199	185	Yes	>0.99
	75	199	185	Yes	>0.99	75	201	185	Yes	>0.99
	3	5	174	195	No	<0.01	5	181	196	No
10		179	195	No	<0.01	10	186	196	No	<0.01
15		183	195	No	<0.01	15	189	196	No	0.01
20		186	195	No	<0.01	20	192	196	No	0.08
25		188	195	No	0.01	25	194	196	No	0.25
30		191	195	No	0.11	30	196	196	Yes	0.50
35		193	195	No	0.27	35	198	196	Yes	0.75
40		195	195	Yes	0.50	40	200	196	Yes	0.92
45		197	195	Yes	0.73	45	202	196	Yes	0.98
50		199	195	Yes	0.89	50	203	196	Yes	0.99
55		201	195	Yes	0.97	55	205	196	Yes	>0.99
60		202	195	Yes	0.99	60	207	196	Yes	>0.99
65		204	195	Yes	>0.99	65	209	196	Yes	>0.99
70		207	195	Yes	>0.99	70	211	196	Yes	>0.99
75		209	195	Yes	>0.99	75	213	196	Yes	>0.99
80		211	195	Yes	>0.99	80	215	196	Yes	>0.99
85	214	195	Yes	>0.99	85	218	196	Yes	>0.99	
90	218	195	Yes	>0.99	90	221	196	Yes	>0.99	
95	223	195	Yes	>0.99	95	226	196	Yes	>0.99	

TABLE 6. (CONTINUED)

Grade	ELA/Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
4	5	181	203	No	<0.01	5	189	206	No	<0.01
	10	187	203	No	<0.01	10	194	206	No	<0.01
	15	190	203	No	<0.01	15	198	206	No	<0.01
	20	193	203	No	<0.01	20	201	206	No	0.04
	25	196	203	No	0.01	25	203	206	No	0.15
	30	198	203	No	0.06	30	206	206	Yes	0.50
	35	200	203	No	0.17	35	208	206	Yes	0.75
	40	202	203	No	0.38	40	210	206	Yes	0.92
	45	204	203	Yes	0.62	45	212	206	Yes	0.98
	50	206	203	Yes	0.83	50	213	206	Yes	0.99
	55	208	203	Yes	0.94	55	215	206	Yes	>0.99
	60	210	203	Yes	0.99	60	217	206	Yes	>0.99
	65	212	203	Yes	>0.99	65	219	206	Yes	>0.99
	70	214	203	Yes	>0.99	70	221	206	Yes	>0.99
	75	216	203	Yes	>0.99	75	224	206	Yes	>0.99
	80	218	203	Yes	>0.99	80	226	206	Yes	>0.99
85	221	203	Yes	>0.99	85	229	206	Yes	>0.99	
90	225	203	Yes	>0.99	90	233	206	Yes	>0.99	
95	230	203	Yes	>0.99	95	238	206	Yes	>0.99	
5	5	188	206	No	<0.01	5	195	210	No	<0.01
	10	193	206	No	<0.01	10	201	210	No	<0.01
	15	197	206	No	<0.01	15	205	210	No	0.04
	20	199	206	No	0.01	20	208	210	No	0.25
	25	202	206	No	0.11	25	210	210	Yes	0.50
	30	204	206	No	0.27	30	213	210	Yes	0.85
	35	206	206	Yes	0.50	35	215	210	Yes	0.96
	40	208	206	Yes	0.73	40	217	210	Yes	0.99
	45	210	206	Yes	0.89	45	219	210	Yes	>0.99
	50	212	206	Yes	0.97	50	221	210	Yes	>0.99
	55	214	206	Yes	0.99	55	223	210	Yes	>0.99
	60	216	206	Yes	>0.99	60	225	210	Yes	>0.99
	65	217	206	Yes	>0.99	65	228	210	Yes	>0.99
	70	220	206	Yes	>0.99	70	230	210	Yes	>0.99
	75	222	206	Yes	>0.99	75	232	210	Yes	>0.99
	80	224	206	Yes	>0.99	80	235	210	Yes	>0.99
85	227	206	Yes	>0.99	85	238	210	Yes	>0.99	
90	231	206	Yes	>0.99	90	242	210	Yes	>0.99	
95	236	206	Yes	>0.99	95	248	210	Yes	>0.99	

TABLE 6. (CONTINUED)

Grade	ELA/Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
6	5	192	213	No	<0.01	5	198	217	No	<0.01
	10	197	213	No	<0.01	10	204	217	No	<0.01
	15	201	213	No	<0.01	15	208	217	No	<0.01
	20	203	213	No	<0.01	20	211	217	No	0.02
	25	206	213	No	0.01	25	214	217	No	0.15
	30	208	213	No	0.06	30	217	217	Yes	0.50
	35	210	213	No	0.17	35	219	217	Yes	0.75
	40	212	213	No	0.38	40	221	217	Yes	0.92
	45	214	213	Yes	0.62	45	223	217	Yes	0.98
	50	216	213	Yes	0.83	50	225	217	Yes	>0.99
	55	218	213	Yes	0.94	55	227	217	Yes	>0.99
	60	219	213	Yes	0.97	60	230	217	Yes	>0.99
	65	221	213	Yes	0.99	65	232	217	Yes	>0.99
	70	223	213	Yes	>0.99	70	234	217	Yes	>0.99
	75	226	213	Yes	>0.99	75	237	217	Yes	>0.99
	80	228	213	Yes	>0.99	80	239	217	Yes	>0.99
85	231	213	Yes	>0.99	85	243	217	Yes	>0.99	
90	235	213	Yes	>0.99	90	247	217	Yes	>0.99	
95	240	213	Yes	>0.99	95	253	217	Yes	>0.99	
7	5	193	213	No	<0.01	5	199	219	No	<0.01
	10	199	213	No	<0.01	10	206	219	No	<0.01
	15	202	213	No	<0.01	15	210	219	No	<0.01
	20	205	213	No	0.01	20	214	219	No	0.04
	25	208	213	No	0.06	25	217	219	No	0.25
	30	210	213	No	0.17	30	219	219	Yes	0.50
	35	212	213	No	0.38	35	222	219	Yes	0.85
	40	214	213	Yes	0.62	40	224	219	Yes	0.96
	45	216	213	Yes	0.83	45	226	219	Yes	0.99
	50	218	213	Yes	0.94	50	229	219	Yes	>0.99
	55	220	213	Yes	0.99	55	231	219	Yes	>0.99
	60	222	213	Yes	>0.99	60	233	219	Yes	>0.99
	65	224	213	Yes	>0.99	65	235	219	Yes	>0.99
	70	226	213	Yes	>0.99	70	238	219	Yes	>0.99
	75	228	213	Yes	>0.99	75	241	219	Yes	>0.99
	80	231	213	Yes	>0.99	80	244	219	Yes	>0.99
85	234	213	Yes	>0.99	85	247	219	Yes	>0.99	
90	238	213	Yes	>0.99	90	251	219	Yes	>0.99	
95	243	213	Yes	>0.99	95	258	219	Yes	>0.99	

TABLE 6. (CONTINUED)

Grade	ELA/Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
8	5	194	214	No	<0.01	5	199	224	No	<0.01
	10	200	214	No	<0.01	10	206	224	No	<0.01
	15	204	214	No	<0.01	15	211	224	No	<0.01
	20	207	214	No	0.01	20	215	224	No	<0.01
	25	209	214	No	0.06	25	218	224	No	0.02
	30	212	214	No	0.27	30	221	224	No	0.15
	35	214	214	Yes	0.50	35	224	224	Yes	0.50
	40	216	214	Yes	0.73	40	226	224	Yes	0.75
	45	218	214	Yes	0.89	45	229	224	Yes	0.96
	50	220	214	Yes	0.97	50	231	224	Yes	0.99
	55	222	214	Yes	0.99	55	233	224	Yes	>0.99
	60	224	214	Yes	>0.99	60	236	224	Yes	>0.99
	65	226	214	Yes	>0.99	65	238	224	Yes	>0.99
	70	228	214	Yes	>0.99	70	241	224	Yes	>0.99
	75	231	214	Yes	>0.99	75	244	224	Yes	>0.99
	80	233	214	Yes	>0.99	80	247	224	Yes	>0.99
	85	236	214	Yes	>0.99	85	251	224	Yes	>0.99
90	240	214	Yes	>0.99	90	255	224	Yes	>0.99	
95	246	214	Yes	>0.99	95	262	224	Yes	>0.99	

Note. %ile=percentile

TABLE 7. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING MISSISSIPPI ASSESSMENT PROGRAM ELA LEVEL 3 (PASS) WHEN MAP IS TAKEN IN THE FALL OR WINTER PRIOR TO SPRING MISSISSIPPI ASSESSMENT PROGRAM TESTS

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
2	5	149	185	No	0.01	5	160	185	No	<0.01
	10	155	185	No	0.05	10	165	185	No	0.01
	15	159	185	No	0.10	15	169	185	No	0.02
	20	162	185	No	0.19	20	172	185	No	0.07
	25	164	185	No	0.26	25	174	185	No	0.14
	30	167	185	No	0.35	30	176	185	No	0.23
	35	169	185	No	0.45	35	178	185	No	0.36
	40	171	185	Yes	0.55	40	180	185	Yes	0.50
	45	173	185	Yes	0.60	45	182	185	Yes	0.64
	50	175	185	Yes	0.70	50	184	185	Yes	0.77
	55	177	185	Yes	0.78	55	186	185	Yes	0.82
	60	179	185	Yes	0.81	60	188	185	Yes	0.90
	65	181	185	Yes	0.88	65	190	185	Yes	0.95
	70	183	185	Yes	0.92	70	192	185	Yes	0.98
	75	185	185	Yes	0.94	75	194	185	Yes	0.99
	80	188	185	Yes	0.97	80	197	185	Yes	>0.99
	85	191	185	Yes	0.99	85	200	185	Yes	>0.99
90	195	185	Yes	>0.99	90	203	185	Yes	>0.99	
95	200	185	Yes	>0.99	95	209	185	Yes	>0.99	
3	5	162	195	No	0.01	5	171	195	No	<0.01
	10	168	195	No	0.03	10	176	195	No	<0.01
	15	172	195	No	0.08	15	180	195	No	0.02
	20	175	195	No	0.13	20	183	195	No	0.06
	25	178	195	No	0.24	25	185	195	No	0.13
	30	180	195	No	0.34	30	188	195	No	0.28
	35	182	195	No	0.39	35	190	195	No	0.35
	40	184	195	Yes	0.50	40	192	195	Yes	0.50
	45	186	195	Yes	0.61	45	194	195	Yes	0.65
	50	188	195	Yes	0.66	50	196	195	Yes	0.78
	55	190	195	Yes	0.76	55	198	195	Yes	0.87
	60	192	195	Yes	0.84	60	199	195	Yes	0.91
	65	194	195	Yes	0.87	65	201	195	Yes	0.96
	70	197	195	Yes	0.94	70	204	195	Yes	0.99
	75	199	195	Yes	0.97	75	206	195	Yes	0.99
	80	202	195	Yes	0.98	80	208	195	Yes	>0.99
	85	205	195	Yes	0.99	85	211	195	Yes	>0.99
90	209	195	Yes	>0.99	90	215	195	Yes	>0.99	
95	214	195	Yes	>0.99	95	221	195	Yes	>0.99	

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
4	5	173	203	No	<0.01	5	179	203	No	<0.01
	10	178	203	No	0.02	10	184	203	No	<0.01
	15	182	203	No	0.05	15	188	203	No	0.01
	20	185	203	No	0.12	20	191	203	No	0.04
	25	188	203	No	0.18	25	194	203	No	0.12
	30	190	203	No	0.27	30	196	203	No	0.22
	35	192	203	No	0.38	35	198	203	No	0.35
	40	194	203	No	0.44	40	200	203	Yes	0.50
	45	196	203	Yes	0.56	45	202	203	Yes	0.58
	50	198	203	Yes	0.67	50	204	203	Yes	0.72
	55	200	203	Yes	0.73	55	205	203	Yes	0.78
	60	202	203	Yes	0.82	60	207	203	Yes	0.88
	65	204	203	Yes	0.88	65	209	203	Yes	0.94
	70	206	203	Yes	0.93	70	211	203	Yes	0.98
	75	209	203	Yes	0.96	75	214	203	Yes	0.99
	80	211	203	Yes	0.98	80	216	203	Yes	>0.99
	85	214	203	Yes	0.99	85	219	203	Yes	>0.99
90	218	203	Yes	>0.99	90	223	203	Yes	>0.99	
95	224	203	Yes	>0.99	95	228	203	Yes	>0.99	
5	5	181	206	No	0.01	5	186	206	No	<0.01
	10	186	206	No	0.05	10	191	206	No	0.01
	15	190	206	No	0.12	15	195	206	No	0.06
	20	193	206	No	0.23	20	197	206	No	0.12
	25	195	206	No	0.33	25	200	206	No	0.28
	30	198	206	No	0.44	30	202	206	No	0.35
	35	200	206	Yes	0.56	35	204	206	Yes	0.50
	40	202	206	Yes	0.67	40	206	206	Yes	0.65
	45	204	206	Yes	0.72	45	208	206	Yes	0.78
	50	206	206	Yes	0.81	50	210	206	Yes	0.88
	55	208	206	Yes	0.88	55	212	206	Yes	0.94
	60	210	206	Yes	0.93	60	214	206	Yes	0.97
	65	212	206	Yes	0.95	65	215	206	Yes	0.98
	70	214	206	Yes	0.97	70	218	206	Yes	>0.99
	75	216	206	Yes	0.99	75	220	206	Yes	>0.99
	80	218	206	Yes	0.99	80	222	206	Yes	>0.99
	85	221	206	Yes	>0.99	85	225	206	Yes	>0.99
90	225	206	Yes	>0.99	90	229	206	Yes	>0.99	
95	231	206	Yes	>0.99	95	234	206	Yes	>0.99	

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
6	5	186	213	No	<0.01	5	190	213	No	<0.01
	10	192	213	No	0.02	10	196	213	No	<0.01
	15	196	213	No	0.07	15	199	213	No	0.01
	20	198	213	No	0.10	20	202	213	No	0.04
	25	201	213	No	0.19	25	204	213	No	0.09
	30	203	213	No	0.28	30	207	213	No	0.22
	35	205	213	No	0.39	35	209	213	No	0.35
	40	207	213	No	0.44	40	211	213	Yes	0.50
	45	209	213	Yes	0.56	45	212	213	Yes	0.58
	50	211	213	Yes	0.67	50	214	213	Yes	0.72
	55	213	213	Yes	0.77	55	216	213	Yes	0.78
	60	215	213	Yes	0.81	60	218	213	Yes	0.88
	65	217	213	Yes	0.88	65	220	213	Yes	0.94
	70	219	213	Yes	0.93	70	222	213	Yes	0.97
	75	221	213	Yes	0.94	75	224	213	Yes	0.99
	80	224	213	Yes	0.98	80	226	213	Yes	>0.99
	85	226	213	Yes	0.99	85	229	213	Yes	>0.99
90	230	213	Yes	>0.99	90	233	213	Yes	>0.99	
95	236	213	Yes	>0.99	95	238	213	Yes	>0.99	
7	5	189	213	No	0.01	5	192	213	No	<0.01
	10	195	213	No	0.04	10	198	213	No	0.01
	15	199	213	No	0.12	15	201	213	No	0.03
	20	202	213	No	0.19	20	204	213	No	0.09
	25	204	213	No	0.28	25	207	213	No	0.22
	30	206	213	No	0.39	30	209	213	No	0.35
	35	209	213	Yes	0.50	35	211	213	Yes	0.50
	40	211	213	Yes	0.61	40	213	213	Yes	0.58
	45	213	213	Yes	0.72	45	215	213	Yes	0.72
	50	214	213	Yes	0.77	50	217	213	Yes	0.83
	55	216	213	Yes	0.81	55	219	213	Yes	0.91
	60	218	213	Yes	0.88	60	221	213	Yes	0.96
	65	220	213	Yes	0.93	65	223	213	Yes	0.98
	70	222	213	Yes	0.96	70	225	213	Yes	0.99
	75	225	213	Yes	0.98	75	227	213	Yes	>0.99
	80	227	213	Yes	0.99	80	230	213	Yes	>0.99
	85	230	213	Yes	>0.99	85	232	213	Yes	>0.99
90	234	213	Yes	>0.99	90	236	213	Yes	>0.99	
95	240	213	Yes	>0.99	95	242	213	Yes	>0.99	

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
8	5	191	214	No	0.02	5	194	214	No	<0.01
	10	197	214	No	0.08	10	199	214	No	0.01
	15	201	214	No	0.16	15	203	214	No	0.05
	20	204	214	No	0.26	20	206	214	No	0.14
	25	207	214	No	0.35	25	209	214	No	0.23
	30	209	214	No	0.45	30	211	214	No	0.36
	35	211	214	Yes	0.55	35	213	214	Yes	0.50
	40	213	214	Yes	0.60	40	215	214	Yes	0.64
	45	215	214	Yes	0.69	45	217	214	Yes	0.77
	50	217	214	Yes	0.78	50	219	214	Yes	0.86
	55	219	214	Yes	0.84	55	221	214	Yes	0.93
	60	221	214	Yes	0.87	60	223	214	Yes	0.97
	65	223	214	Yes	0.92	65	225	214	Yes	0.99
	70	225	214	Yes	0.95	70	227	214	Yes	0.99
	75	228	214	Yes	0.97	75	229	214	Yes	>0.99
	80	230	214	Yes	0.98	80	232	214	Yes	>0.99
	85	234	214	Yes	>0.99	85	235	214	Yes	>0.99
90	237	214	Yes	>0.99	90	239	214	Yes	>0.99	
95	243	214	Yes	>0.99	95	244	214	Yes	>0.99	

Note. %ile=percentile

TABLE 8. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING MISSISSIPPI ASSESSMENT PROGRAM MATH LEVEL 3 (PASS) WHEN MAP IS TAKEN IN THE FALL OR WINTER PRIOR TO SPRING MISSISSIPPI ASSESSMENT PROGRAM TESTS

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
2	5	155	185	No	0.04	5	165	185	No	<0.01
	10	160	185	No	0.12	10	170	185	No	0.03
	15	163	185	No	0.24	15	173	185	No	0.11
	20	166	185	No	0.39	20	175	185	No	0.21
	25	168	185	No	0.44	25	178	185	No	0.42
	30	170	185	Yes	0.56	30	180	185	Yes	0.58
	35	172	185	Yes	0.67	35	181	185	Yes	0.66
	40	174	185	Yes	0.76	40	183	185	Yes	0.79
	45	175	185	Yes	0.76	45	185	185	Yes	0.89
	50	177	185	Yes	0.84	50	186	185	Yes	0.92
	55	179	185	Yes	0.90	55	188	185	Yes	0.97
	60	180	185	Yes	0.93	60	190	185	Yes	0.99
	65	182	185	Yes	0.96	65	191	185	Yes	0.99
	70	184	185	Yes	0.97	70	193	185	Yes	>0.99
	75	186	185	Yes	0.98	75	195	185	Yes	>0.99
	80	188	185	Yes	0.99	80	197	185	Yes	>0.99
	85	191	185	Yes	>0.99	85	200	185	Yes	>0.99
90	194	185	Yes	>0.99	90	203	185	Yes	>0.99	
95	199	185	Yes	>0.99	95	208	185	Yes	>0.99	
3	5	169	196	No	0.02	5	176	196	No	<0.01
	10	174	196	No	0.11	10	181	196	No	0.03
	15	177	196	No	0.22	15	184	196	No	0.10
	20	179	196	No	0.32	20	187	196	No	0.20
	25	182	196	Yes	0.50	25	189	196	No	0.34
	30	184	196	Yes	0.56	30	191	196	Yes	0.50
	35	185	196	Yes	0.62	35	193	196	Yes	0.66
	40	187	196	Yes	0.73	40	195	196	Yes	0.80
	45	189	196	Yes	0.83	45	197	196	Yes	0.90
	50	190	196	Yes	0.86	50	198	196	Yes	0.93
	55	192	196	Yes	0.92	55	200	196	Yes	0.97
	60	194	196	Yes	0.96	60	202	196	Yes	0.99
	65	195	196	Yes	0.97	65	203	196	Yes	0.99
	70	197	196	Yes	0.99	70	205	196	Yes	>0.99
	75	199	196	Yes	0.99	75	207	196	Yes	>0.99
	80	201	196	Yes	>0.99	80	209	196	Yes	>0.99
	85	204	196	Yes	>0.99	85	212	196	Yes	>0.99
90	207	196	Yes	>0.99	90	215	196	Yes	>0.99	
95	212	196	Yes	>0.99	95	220	196	Yes	>0.99	

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
4	5	179	206	No	0.01	5	185	206	No	<0.01
	10	184	206	No	0.06	10	190	206	No	0.01
	15	188	206	No	0.17	15	194	206	No	0.07
	20	190	206	No	0.27	20	197	206	No	0.20
	25	193	206	No	0.44	25	199	206	No	0.34
	30	195	206	Yes	0.56	30	201	206	Yes	0.50
	35	197	206	Yes	0.68	35	203	206	Yes	0.66
	40	198	206	Yes	0.73	40	205	206	Yes	0.80
	45	200	206	Yes	0.83	45	207	206	Yes	0.90
	50	202	206	Yes	0.89	50	209	206	Yes	0.95
	55	204	206	Yes	0.94	55	211	206	Yes	0.98
	60	205	206	Yes	0.94	60	212	206	Yes	0.99
	65	207	206	Yes	0.97	65	214	206	Yes	>0.99
	70	209	206	Yes	0.99	70	216	206	Yes	>0.99
	75	211	206	Yes	0.99	75	218	206	Yes	>0.99
	80	214	206	Yes	>0.99	80	221	206	Yes	>0.99
	85	216	206	Yes	>0.99	85	223	206	Yes	>0.99
90	220	206	Yes	>0.99	90	227	206	Yes	>0.99	
95	225	206	Yes	>0.99	95	232	206	Yes	>0.99	
5	5	187	210	No	0.03	5	192	210	No	<0.01
	10	193	210	No	0.15	10	198	210	No	0.05
	15	196	210	No	0.28	15	201	210	No	0.15
	20	199	210	No	0.44	20	204	210	No	0.34
	25	202	210	Yes	0.62	25	207	210	Yes	0.58
	30	204	210	Yes	0.72	30	209	210	Yes	0.73
	35	206	210	Yes	0.81	35	211	210	Yes	0.85
	40	208	210	Yes	0.88	40	213	210	Yes	0.93
	45	210	210	Yes	0.93	45	215	210	Yes	0.97
	50	211	210	Yes	0.95	50	217	210	Yes	0.99
	55	213	210	Yes	0.97	55	219	210	Yes	>0.99
	60	215	210	Yes	0.99	60	221	210	Yes	>0.99
	65	217	210	Yes	0.99	65	223	210	Yes	>0.99
	70	219	210	Yes	>0.99	70	225	210	Yes	>0.99
	75	221	210	Yes	>0.99	75	228	210	Yes	>0.99
	80	224	210	Yes	>0.99	80	230	210	Yes	>0.99
	85	227	210	Yes	>0.99	85	233	210	Yes	>0.99
90	230	210	Yes	>0.99	90	237	210	Yes	>0.99	
95	236	210	Yes	>0.99	95	242	210	Yes	>0.99	

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
6	5	192	217	No	0.01	5	196	217	No	<0.01
	10	198	217	No	0.05	10	202	217	No	0.01
	15	202	217	No	0.15	15	205	217	No	0.03
	20	205	217	No	0.28	20	209	217	No	0.15
	25	207	217	No	0.38	25	211	217	No	0.27
	30	209	217	Yes	0.50	30	214	217	Yes	0.50
	35	212	217	Yes	0.67	35	216	217	Yes	0.66
	40	214	217	Yes	0.77	40	218	217	Yes	0.80
	45	216	217	Yes	0.85	45	220	217	Yes	0.89
	50	218	217	Yes	0.91	50	222	217	Yes	0.95
	55	220	217	Yes	0.95	55	224	217	Yes	0.98
	60	222	217	Yes	0.97	60	226	217	Yes	0.99
	65	224	217	Yes	0.99	65	228	217	Yes	>0.99
	70	226	217	Yes	0.99	70	230	217	Yes	>0.99
	75	228	217	Yes	>0.99	75	233	217	Yes	>0.99
	80	231	217	Yes	>0.99	80	236	217	Yes	>0.99
	85	234	217	Yes	>0.99	85	239	217	Yes	>0.99
90	238	217	Yes	>0.99	90	243	217	Yes	>0.99	
95	243	217	Yes	>0.99	95	248	217	Yes	>0.99	
7	5	195	219	No	<0.01	5	198	219	No	<0.01
	10	201	219	No	0.03	10	204	219	No	<0.01
	15	205	219	No	0.11	15	208	219	No	0.03
	20	209	219	No	0.27	20	212	219	No	0.15
	25	211	219	No	0.38	25	215	219	No	0.34
	30	214	219	Yes	0.56	30	217	219	Yes	0.50
	35	216	219	Yes	0.68	35	220	219	Yes	0.74
	40	218	219	Yes	0.78	40	222	219	Yes	0.85
	45	221	219	Yes	0.89	45	224	219	Yes	0.93
	50	223	219	Yes	0.94	50	226	219	Yes	0.97
	55	225	219	Yes	0.97	55	228	219	Yes	0.99
	60	227	219	Yes	0.98	60	230	219	Yes	>0.99
	65	229	219	Yes	0.99	65	233	219	Yes	>0.99
	70	231	219	Yes	>0.99	70	235	219	Yes	>0.99
	75	234	219	Yes	>0.99	75	238	219	Yes	>0.99
	80	237	219	Yes	>0.99	80	240	219	Yes	>0.99
	85	240	219	Yes	>0.99	85	244	219	Yes	>0.99
90	244	219	Yes	>0.99	90	248	219	Yes	>0.99	
95	250	219	Yes	>0.99	95	254	219	Yes	>0.99	

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
8	5	197	224	No	<0.01	5	199	224	No	<0.01
	10	203	224	No	0.02	10	206	224	No	<0.01
	15	208	224	No	0.08	15	210	224	No	0.01
	20	211	224	No	0.15	20	214	224	No	0.06
	25	214	224	No	0.26	25	217	224	No	0.16
	30	217	224	No	0.40	30	220	224	No	0.35
	35	219	224	Yes	0.50	35	222	224	Yes	0.50
	40	222	224	Yes	0.65	40	225	224	Yes	0.72
	45	224	224	Yes	0.74	45	227	224	Yes	0.84
	50	226	224	Yes	0.82	50	229	224	Yes	0.92
	55	229	224	Yes	0.90	55	231	224	Yes	0.96
	60	231	224	Yes	0.94	60	234	224	Yes	0.99
	65	233	224	Yes	0.97	65	236	224	Yes	>0.99
	70	236	224	Yes	0.98	70	239	224	Yes	>0.99
	75	238	224	Yes	0.99	75	241	224	Yes	>0.99
	80	241	224	Yes	>0.99	80	245	224	Yes	>0.99
	85	245	224	Yes	>0.99	85	248	224	Yes	>0.99
90	249	224	Yes	>0.99	90	253	224	Yes	>0.99	
95	256	224	Yes	>0.99	95	259	224	Yes	>0.99	

Note. %ile=percentile

Summary and Discussion

This study produced a set of cut scores on MAP reading and math tests for Grades 2 to 8 that correspond to each Mississippi Assessment Program performance level. By using matched score data from a sample of students from Mississippi, the study demonstrates that MAP scores can accurately predict whether a student could be proficient or above on the basis of his/her MAP scores. This study also used the 2015 NWEA norming study results to project a student's probability to meet proficiency based on that student's prior MAP scores in fall and winter. These results will help educators predict student performance in Mississippi Assessment Program tests as early as possible and identify those students who are at risk of failing to meet required standards so that they can receive necessary resources and assistance to meet their goals.

While concordance tables can be helpful and informative, they have general limitations. First, the concordance tables provide information about score comparability on different tests, but the scores cannot be assumed to be interchangeable. In the case for Mississippi Assessment Program and MAP tests, as they are not parallel in content, scores from these two tests should not be directly compared. Second, while the sample data used in this study were collected from 42 schools in Mississippi, caution should be exercised when generalizing the results to test takers who differ significantly from this sample. Finally, caution should be exercised if the concorded scores are used for a subpopulation. NWEA will continue to gather information about Mississippi Assessment Program performance from other schools in Mississippi to enhance the quality and generalizability of the study.

References

- Hanson, B. A., Harris, D. J., Pommerich, M., Sconing, J. A., & Yi, Q. (2001). *Suggestions for the evaluation and use of concordance results*. (ACT Research Report No. 2001-1). Iowa City, IA: ACT, Inc.
- Kolen, M. J., & Brennan, R. L. (2004). *Test equating, scaling, and linking*. New York: Springer.
- Pommerich, M., Hanson, B., Harris, D., & Sconing, J. (2004). Issues in conducting linkage between distinct tests. *Applied Psychological Measurement, 28*(4), 247-273.
- Thum Y. M., & Hauser, C. H. (2015). *NWEA 2015 MAP Norms for Student and School Achievement Status and Growth*. NWEA Research Report. Portland, OR: NWEA.

Appendix

Data and Analysis

Data

Data used in this study were collected from 42 schools in Mississippi. The sample contained matched Mississippi Assessment Program ELA and MAP reading scores of 13,572 students in Grades 3 to 8 and matched Mississippi Assessment Program and MAP math scores of 13,502 students in Grades 3 to 8 who completed both MAP and Mississippi Assessment Program in the spring of 2016.

To understand the statistical characteristics of the test scores, descriptive statistics are provided in Table A1 below. As Table A1 indicates, the correlation coefficients between MAP reading and Mississippi Assessment Program ELA scores range from 0.78 to 0.82, and the correlation coefficients between MAP and Mississippi Assessment Program math scores range from 0.82 to 0.88. In general, all these correlations indicate a strong relationship between MAP and Mississippi Assessment Program test scores.

TABLE A1. DESCRIPTIVE STATISTICS OF THE SAMPLE DATA

Subject	Grade	N	<i>r</i>	Mississippi Assessment Program				MAP			
				Mean	SD	Min	Max	Mean	SD	Min	Max
ELA/ Reading	3	2567	0.80	355.39	17.32	301	399	197.48	15.26	136	244
	4	2277	0.78	456.40	18.71	401	499	207.20	13.75	153	243
	5	2285	0.82	557.43	16.43	510	599	211.32	15.43	138	254
	6	2323	0.82	654.14	17.78	601	699	214.09	15.15	149	256
	7	2088	0.80	756.48	14.43	710	794	216.90	16.05	150	262
	8	2032	0.78	858.23	14.97	801	899	219.96	15.75	146	260
Math	3	2581	0.85	356.76	17.35	303	399	199.78	12.55	144	250
	4	2274	0.88	458.56	17.45	407	499	211.37	13.20	148	256
	5	2282	0.86	558.38	14.52	521	599	217.99	15.52	159	268
	6	2313	0.87	656.81	16.98	609	699	220.76	15.62	155	277
	7	2092	0.85	760.24	17.77	701	799	225.96	16.52	135	287
	8	1960	0.82	858.73	17.59	823	899	229.90	17.41	149	328

Equipercentile Linking Procedure

The equipercentile procedure (e.g., Kolen & Brennan, 2004) was used to establish the concordance relationship between Mississippi Assessment Program and MAP scores for grades 3 to 8 in ELA/reading and math. This procedure matches scores on the two scales that have the same percentile rank (i.e., the proportion of scores at or below each score).

Suppose we need to establish the concorded scores between two tests. x is a score on Test X (e.g., Mississippi Assessment Program). Its equipercentile equivalent score on Test Y (e.g., MAP), $e_y(x)$, can be obtained through a cumulative-distribution-based linking function defined in Equation (A1):

$$e_y(x) = G^{-1}[P(x)] \quad (\text{A1})$$

where $e_y(x)$ is the equipercentile equivalent of scores on Mississippi Assessment Program on the scale of MAP, $P(x)$ is the percentile rank of a given score on Test X . G^{-1} is the inverse of the percentile rank function for scores on Test Y which indicates the scores on Test Y corresponding to a given percentile. Polynomial loglinear pre-smoothing was applied to reduce irregularities of the frequency distributions as well as equipercentile linking curve.

Consistency Rate of Classification

Consistency rate of classification accuracy, expressed in the form of a rate between 0 and 1, measures the extent to which MAP scores (and the estimated MAP cut scores) accurately predicted whether students in the sample would pass (i.e., Level 3 or higher) on Mississippi Assessment Program tests.

To calculate consistency rate of classification, sample students were designated “Below Mississippi Assessment Program cut” or “At or above Mississippi Assessment Program cut” based on their actual Mississippi Assessment Program scores. Similarly, they were also designated as “Below MAP cut” or “At or above MAP cut” based on their actual MAP scores. A 2-way contingency table was then tabulated (see Table A2), classifying students as “Pass” on the basis of Mississippi Assessment Program cut score and concordant MAP cut score. Students classified in the *true positive* (TP) category were those predicted to be Pass based on the MAP cut scores and were also classified as Pass based on the Mississippi Assessment Program cut scores. Students classified in the *true negative* (TN) category were those predicted to be Not Pass based on the MAP cut scores and were also classified as Not Pass based on the Mississippi Assessment Program cut scores. Students classified in the *false positive* (FP) category were those predicted to be Pass based on the MAP cut scores but were classified as Not Pass based on the Mississippi Assessment Program cut scores. Students classified in the *false negative* (FN) category were those predicted to be Not Pass based on the MAP cut scores but were classified as Pass based on the Mississippi Assessment Program cut scores. The overall consistency rate of classification

was computed as the proportion of correct classifications among the entire sample by $(TP+TN) / (TP+TN+FP+FN)$.

TABLE A2. DEFINITION OF CONSISTENCY RATE FOR MISSISSIPPI ASSESSMENT PROGRAM TO MAP CONCORDANCE

		Mississippi Assessment Program Score	
		Below Mississippi Assessment Program cut	At or Above Mississippi Assessment Program cut
MAP Score	Below MAP cut	True Negative	False Negative
	At or Above MAP cut	False Positive	True Positive

Note. Shaded cells are summed to compute the consistency rate.

Proficiency Projection

MAP conditional growth norms provide student's expected gain scores across testing seasons (Thum & Hauser, 2015). This information is utilized to predict a student's performance on the Mississippi Assessment Program based on that student's MAP scores in prior seasons (e.g. fall and winter). The probability of a student achieving Level 3 (Pass) on Mississippi Assessment Program, based on his/her fall or winter MAP score is given in Equation (A2):

$$Pr(\text{Achieving Level 3 in spring} | \text{a RIT score of } x) = \Phi\left(\frac{x + g - c}{SD}\right) \quad (A2)$$

where, Φ is a standardized normal cumulative distribution, x is the student's RIT score in fall or winter, g is the expected growth from fall or winter to spring corresponding to x , c is the MAP cut-score for spring, and SD is the conditional standard deviation of growth from fall or winter to spring.

For the probability of a student achieving Level 3 on the MISSISSIPPI ASSESSMENT PROGRAM tests, based on his/her spring score s , it can be calculated by Equation (A3):

$$Pr(\text{Achieving Level 3 in spring} | \text{a RIT score of } s \text{ in spring}) = \Phi\left(\frac{s - c}{SE}\right) \quad (A3)$$

where SE is the standard error of measurement for MAP reading or math test.

NWEA is a not-for-profit organization that supports students and educators worldwide by providing assessment solutions, insightful reports, professional learning offerings, and research services. Visit NWEA.org to find out how NWEA can partner with you to help all kids learn.

© NWEA 2017. MAP is a registered trademark, and NWEA, MAP Growth, and Measuring What Matters are trademarks, of NWEA in the US and in other countries. The names of other companies and their products mentioned are the trademarks of their respective owners.