

FAST Demographically-Matched National Norms

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FAST 2019 National Norms

Introduction

The national seasonal norms (fall, winter, and spring), and growth (fall-to-winter, fall-to-spring, and winter-to-spring) for selected FAST assessments were updated and will be available beginning in August 2019. The update also impacts default benchmarks because the benchmarks are anchored to the national norms (i.e., 15th and 40th percentiles).

This update differs from prior norm updates in that FAST researchers employed sampling procedures designed to produce robust samples with demographic characteristics matched to the overall U.S. student population by gender, race/ethnicity, and the percent of students receiving free or reduced lunch as indicated in the Common Core of Data (CCD) from the U.S. Department of Education. The sampling procedures were repeated 30 times for each combination of assessment and grade and included 100 schools from across 18 to 20 states. Each of the 30 samples consisted of more than 7,000 students, which is sufficient to produce very stable estimates across the full range of norms from the 1st through 99th percentiles.

Benefits

The new demographically-matched national norms accurately represent the distribution of scores on FAST assessments that would be obtained with the full U.S. school population by grade. Thus, the new norms provide FAST customers a more precise way to evaluate student, classroom, grade level, school, and district results relative to national score distributions. The procedures employed also increase the accuracy of the national norms across the full range of abilities from the 1st through the 99th percentiles. Due to the sample sizes and statistical procedures applied, the 2019 FAST norms should continue to accurately represent the U.S. school population for approximately the next five years.

Comparison to Prior Editions of FAST National Norms

On average, there was a small downward shift in the scores matched to the 50th percentile. The difference became a bit more pronounced in the lower percentile range. For example, the score associated with the *some risk* and *high risk* winter benchmarks for CBMreading in Grade 2 dropped 4 words per minute and 15 words per minute, respectively. What this means is that, on average, fewer students will be flagged as either *high risk* or *some risk* according to the FAST default benchmarks. The decline occurs primarily because the percentage of economically disadvantaged students was under-represented in the prior norm samples. In the upper percentile range, there is a small upward shift which means that fewer students will score in the top decile between the 90th and 99th percentiles.

Table 1 lists the FAST assessments with new 2019 national norms. Demographically matched national norms were developed for FAST aMath™, FAST aReading™, and

FAST CBMreading English™, the FAST earlyReading™ and FAST earlyMath™ composite, and the assessments that form the composites. Aggregate national norms were updated for FAST CBMmath Automaticity™ and FAST CBMmath CAP™. The samples available for these assessments were not sufficiently robust to demographically match the U.S. school population. However, because they are significantly larger than the prior update, the new aggregate norms are more stable and accurate across the full range of abilities.

Table 1. FAST assessments included in 2019 norm update

FAST Assessment	Grade(s)	Season(s)
earlyReading Composite	K – 1	All
• Concepts of Print	K	F
• Onset Sounds	K	F, W
• Letter Names	K	F
• Letter Sounds	K	All
• Word Segmenting	K – 1	All
• Nonsense Words	K – 1	All
• Sight Words	K – 1	All
• Sentence Reading	1	F
• CBMreading	1	W, S
earlyMath Composite	K – 1	All
• Match Quantity	K	F
• Number Sequence	K – 1	All
• Numeral Identification	K – 1	All
• Decomposing	K – 1	All
• Place Value	1	W, S
• Story Problems	1	S
CBMreading	1 – 6	All
CBMreading (aggregate norms)	7 – 8	All
aReading	K – 8	All
aMath	K – 8	All
CBMmath Automaticity (aggregate norms)	1 – 3	All
CBMmath CAP (aggregate norms)	2 – 6	All

Procedures

The 2019 FAST national norms were derived from FAST customer data obtained in the 2017-18 academic school year. Starting with all available scores for each FAST assessment, a series of data cleaning procedures were run to eliminate duplicate administrations (i.e., a second entry of the same score from the same date and time stamp for a given student), off-grade administrations, scores outside realistic

boundaries (e.g., setting the maximum words read correctly per minute on CBMreading to 350), scores outside the grade range to be normed, and scores outside the seasonal testing window. Seasonal administration windows were defined as follows

- Fall: August 1 – October 31
- Winter: January 1 – February 15
- Spring: April 15 – May 31

These time frames were chosen because most FAST screening scores (about 95%) fall within these date ranges. Extending the range to include the additional 5% was rejected because it would skew the norms and produce less precise results for the majority of customers who test within these ranges. *NOTE: we should consider providing interpolated seasonal norms for students assessed between the windows (e.g., in December or March).*

The result was a unique test score file for each FAST assessment included in the 2019 norm update.

Demographically Matched Norms

The 2016-17 Common Core of Data School Characteristics and Membership (CCD, U.S. Department of Education) databases were used to obtain counts by sex, race/ethnicity by grade within school, and free and reduced lunch at the school level, and to define demographic targets by grade as shown in Table 2.

The CCD files were merged with the FAST school database using local education agency (LEA) name, school name, and state. A total of 4,568 FAST schools were successfully matched to the CCD database.

Table 2. U.S. demographic targets by grade

Grade	Gender		Race/Ethnicity					Percent on Free or Reduced Lunch		
	Male	Female	White	Black	Hispanic	Asian	Other	0-33	34-66	67-100
K	51.6	48.4	46.2	14.7	28.0	5.0	6.1	31	38	31
1	51.4	48.6	46.2	15.2	27.6	5.0	5.9	31	38	31
2	51.3	48.7	46.2	15.4	27.7	4.9	5.7	31	38	31
3	51.3	48.7	46.2	15.5	27.8	5.0	5.6	31	38	31
4	51.2	48.8	46.8	15.1	27.7	5.0	5.5	31	38	31
5	51.2	48.8	47.2	14.9	27.6	5.0	5.3	31	38	31
6	51.3	48.7	47.9	14.8	27.1	5.1	5.1	31	38	31
7	51.3	48.7	48.6	14.7	26.5	5.2	4.9	31	38	31
8	51.2	48.8	49.1	14.8	26.3	5.2	4.7	31	38	31

In the next phase, schools that universally screen students (i.e., assess virtually all students) using FAST assessments were identified. Schools were considered to universally screen if the ratio of the number of students with valid scores in a given grade and season was at least 85% of the total number of students in that grade and season. Schools in which the total number with a valid score varied by more than 15% across seasons were excluded because the CCD demographics were not season specific and would only be valid if at least 85% of students were tested in a given grade and season. The threshold of 85% was used to account for the fact that some students were excluded due to test scores outside of the defined testing window and to account for some variation in the total number of students tested across seasons.

Table 3 shows the number of schools that met the conditions for universal screening by assessment, and that were matched to the CCD file. The earlyReading and earlyMath counts apply to each assessment comprising the Composite. For each FAST assessment, schools from between 18 and 21 states were represented.

Table 4 and 5 show the range of the number of students in the Score File available for norms selection by grade.

Table 3. Number of FAST schools universally screening by assessment

Fast Assessment	Number of Schools	Grade Range
earlyReading	1,464	K – 1
earlyMath	471	K – 1
aMath	2,009	K – 8
aReading	2,809	K – 8
CBMreading English	3,716	1 – 8
CBMmath Automaticity	964	1 – 3
CBMmath CAP	1,208	2 – 8

Table 4. Number of students in the Score File by grade.

Assessment	Grade	N-Count
earlyReading	K	47,211 – 48,719
	1	44,428 – 44,882
earlyMath	K	18,777 – 19,446
	1	17,640 – 18,094
aReading	K	19,784 – 37,941
	1	49,957 – 54,616
	2	33,628 – 34,797
	3	34,243 – 34,713
	4	33,225 – 34,278
	5	32,025 – 33,366
	6	22,387 – 23,099
	7	28,100 – 40,727
8	26,983 – 40,006	

aMath	K	17,425 – 30,218
	1	32,883 – 47,497
	2	25,563 – 26,066
	3	24,360 – 27,470
	4	23,874 – 25,564
	5	23,084 – 24,491
	6	16,227 – 17,056
	7	25,301 – 36,071
	8	22,992 – 34,160
CBMreading English	1	53,036 – 53,866
	2	48,418 – 48,644
	3	43,816 – 46,647
	4	41,395 – 43,354
	5	34,507 – 36,671
	6	14,975 – 15,426

Table 5. Number of students in the Score File by grade.

Assessment	Grade	N-Count
CBMmath Automaticity	1	6,529 – 10,739
	2	3,828 – 18,055
	3	3,333 – 14,750
CBMmath CAP	2	7,700 – 11,584
	3	5,775 – 9,795
	4	7,304 – 12,993
	5	6,799 – 14,275
	6	6,310 – 13,090
	7	4,898 – 10,989
	8	3,292 – 10,040

Using the scores of students from schools that universally screen, an iterative sampling procedure selected 100 schools randomly with replacement such that the total sample matched the demographic percentages in the national population on gender, race/ethnicity, and percent receiving free or reduced lunch. To validate this procedure, a separate simulation analysis, using the characteristics of CBMreading was conducted. The results showed that with as few as 6,000 students, the root mean squared deviation, an indicator of stability, was less than 0.50 words per minute at the 50th percentile, and less than 1 word per minute at the 99th percentile. Thus, this method resulted in accurate and stable norms across the full range of abilities.

Because the current FAST customer base is concentrated in the Midwest, constraints were added to the sampling procedure. First, an initial sample of 10 schools was drawn from states outside of the Midwest. Second, the percentage of

schools from the Midwest was limited to 30% of the overall sample. Third, no school could account for more than 5% of the total sample in each replication. Matching to national percentages by race, especially Hispanic, and free or reduced lunch also ensured broad representation across states and urbanicity. The procedure was repeated 30 times for both the seasonal scores and the growth scores.

Table 6 shows the final demographic percentages by grade. The sampling strategy resulted in percentages that conform closely to the U.S. school population percentages in Table 2. Because sampling was performed at the school level, the percentages at each free/reduced lunch level match perfectly to the U.S. school population.

The sampling strategy did not result in a precise demographic-match for aReading and aMath in Kindergarten and Grades 1, 7, and 8. Therefore, statistical adjustments were derived by fitting polynomial models to the distribution of scores conditioned on grade and season. This modeling takes advantage of the fact that aReading and aMath are scored on a vertical scale that spans Kindergarten through Grade 8. Separate third-degree polynomial models were fitted by percentile, 1 – 99. These models resulted in very strong fit with R^2 values of 0.99 and higher. The predicted values were used as the demographically-matched national norm scores in Kindergarten and Grades 1, 7, and 8.

Table 6. Final demographic percentages by grade

Assessment	Grade	Gender		Race/Ethnicity					Percent F/R Lunch		
		Male	Female	White	Black	Asian	Hispanic	Other	0-33	34-66	67-100
earlyReading	0	51.0	49.0	46.0	13.5	7.3	26.7	6.5	31.0	38.0	31.0
	1	50.9	49.1	45.2	13.4	8.8	25.9	6.7	31.0	38.0	31.0
earlyMath	0	50.1	49.9	45.2	13.7	8.2	26.6	6.2	31.0	38.0	31.0
	1	50.5	49.5	44.5	13.3	10.4	25.8	6.0	31.0	38.0	31.0
aMath	2	51.8	48.2	44.5	13.8	9.9	25.9	5.9	31.0	38.0	31.0
	3	51.0	49.0	45.1	14.5	8.1	26.3	6.0	31.0	38.0	31.0
	4	50.8	49.2	46.1	14.7	6.8	26.6	5.9	31.0	38.0	31.0
	5	51.1	48.9	45.7	13.3	9.6	26.0	5.4	31.0	38.0	31.0
	6	51.0	49.0	46.9	13.9	7.5	25.9	5.8	31.0	38.0	31.0
aReading	2	51.2	48.8	45.1	14.2	8.3	26.4	6.0	31.0	38.0	31.0
	3	51.1	48.9	45.2	14.0	8.2	26.2	6.5	31.0	38.0	31.0
	4	50.7	49.3	45.4	13.3	9.3	25.8	6.3	31.0	38.0	31.0
	5	50.9	49.1	45.7	13.2	9.5	25.8	5.8	31.0	38.0	31.0
	6	51.6	48.4	47.2	13.8	7.5	26.0	5.6	31.0	38.0	31.0
CBMreading English	1	51.1	48.9	45.9	13.5	8.3	26.0	6.3	31.0	38.0	31.0
	2	50.2	49.8	45.7	14.1	7.2	26.5	6.5	31.0	38.0	31.0
	3	51.0	49.0	46.8	14.3	5.6	26.6	6.7	31.0	38.0	31.0

4	51.5	48.5	48.8	13.6	4.7	26.1	6.8	31.0	38.0	31.0
5	50.7	49.3	50.3	13.4	3.9	26.4	6.0	31.0	38.0	31.0
6	52.2	47.8	49.2	14.0	5.9	26.5	4.4	31.0	38.0	31.0

For each replication, percentiles ranging from 1 through 99 were computed using the Type 3 quantile algorithm in R (Becker, Chambers, and Wilks, 1988). The algorithm identifies the FAST assessment score corresponding to each percentile. The mean score at each percentile across the 30 replications, rounded to the nearest whole number was used as the final norm value.

For some earlyReading and earlyMath subtests and for CBMreading, the FAST system reports a fluency score, such as *words correct per minute*, and an accuracy score. The updated norms apply only to the fluency scores where available. For aReading and aMath, the scaled score was used. The growth score was the average monthly gain on aReading and aMath, and the average weekly gain on the other assessments. Gain scores, known as the rate of improvement (ROI), were computed from fall, winter, and spring screening scores.

Aggregate Norms

The procedure used to generate national norms for CBMmath CAP and CBMmath Automaticity screening assessments did not include randomly sampling 100 schools or repeated replications. Rather *all* schools that used the assessment for universal screening were included. The samples were similar to the national population in the proportion of males and females; but, had a higher percentage of white students (about 60% compared to about 48% in the U.S. school population) and a lower percentage of schools at the highest free or reduced lunch rate level (about 22% compared to 31% of the U.S. school population). Despite these limitations, when compared to the sample used to develop prior editions of FAST norms, the new sample is larger and has better representation in the tails of the distribution. The number of students represented in each group for CBMreading (Grades 7 & 8) range from 15,000 – 22,000 and CBMmath Automaticity and CAP ranged from about 3,000 to over 14,000.

Results

Relative to prior versions of FAST norms, the 2019 demographically-matched norms shifted downward slightly at the 50th percentile. The difference became more pronounced in the lower percentile range. For example, the score associated with the *some risk* and *high risk* winter benchmarks for CBMreading in Grade 2 dropped 4 words per minute and 15 words per minute, respectively. What this means is that, on average, fewer students will be flagged as either high risk or some risk using default FAST benchmarks. The decline occurs primarily because the percentage of economically disadvantaged students was under-represented in the prior norm samples. In the upper percentile range, there was a small upward shift

which means that fewer students will score in the top decile between the 90th and 99th percentiles.

Figure 1 illustrates the relationship between the 2019 FAST national norms and the prior FAST norms from 2017 using results from CBMreading in the winter of Grade 2. Each point represents the words read correctly per minute associated with a percentile value from 1 through 99. In the lower tail of the percentile range (i.e., 1st – 15th percentiles), the score associated with each percentile is higher in the 2017 norms than the new 2019 norms. The gap decreases through the 70th percentile, then reverses from the 70th through 99th percentiles.

This interaction represents the effects of two differences between the new and prior norms. Relative to the prior norms, the 2019 norms shifted downward and were stretched in the tails. The small downward shift is evident by the gap between the points at the 50th percentile and is primarily a function of the differences in overall free or reduced lunch rates of the prior and 2019 norm groups. The small to moderate gap in the tails is a result of better representation across the full range of abilities.

The two vertical lines represent the *high risk* and *some risk* benchmarks. The benchmark score for the new norms is 15 points lower for high risk and 4 points lower for some risk. To put these differences in context, the *high risk* benchmark difference is about 0.5 standard deviation units and is considered moderate, and the low risk difference is about 0.1 standard deviation units and is considered small. Similar patterns are seen in other grades and with other assessments.

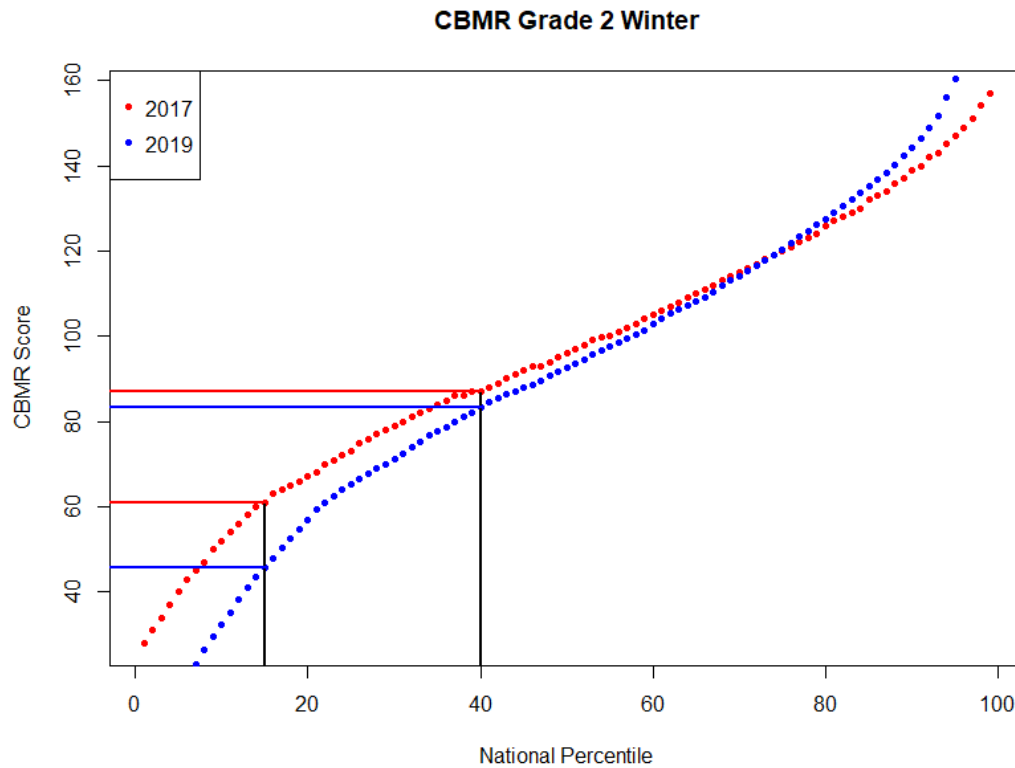


Figure 1. 2017 vs 2019 national norms, CBMreading

Figure 2 illustrates the relationship between the prior and 2019 growth norms for the earlyMath Composite rate of improvement (ROI) from fall to spring in Grade 1. An interaction pattern can be seen in which the 2019 growth norms are slightly lower in the lower tail and higher in the upper tail with the intersection occurring at about the 25th percentile. Although the relationship between the new 2019 and prior FAST growth norms varies across the FAST assessments, it is always quite small.

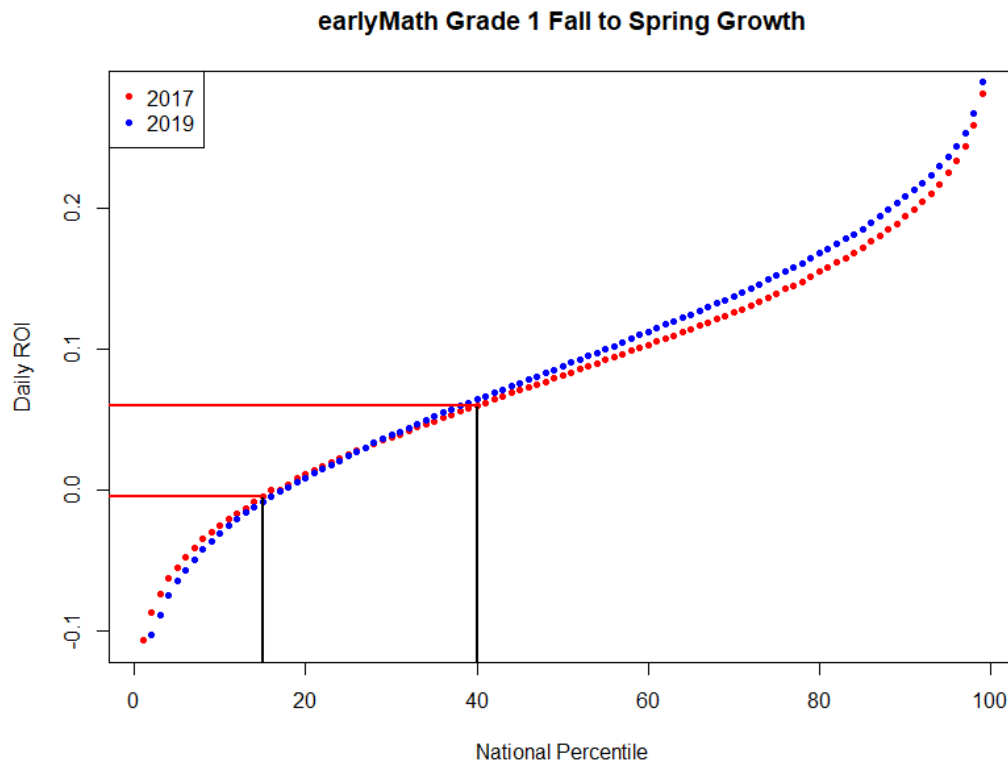


Figure 2. 2017 vs 2019 national growth norms, earlyMath

Appendix A provides a comparison between the prior and 2019 FAST benchmarks for each assessment, by grade and season. The values represent the assessment score associated with each benchmark, which are anchored to national percentile levels:

college pathway: 70th national percentile

some risk: 40th national percentile

high risk: 15th national percentile

The magnitude of the difference at a given benchmark is influenced by the true differences between the prior 2017 norms and the new 2019 norms, the distance from the median (50th percentile), and the scale of the assessment. The first two factors are consistent across assessments. But the scales used in the FAST assessments vary substantially and need to be considered in interpreting the differences between the benchmark scores. The last column lists the effect size – which is the ratio of the difference to the standard deviation for the assessment, by grade and season. Effect sizes are interpreted as follows:

- less than 0.35 are small
- 0.35 to 0.65 are moderate

- greater than 0.65 are large

Using these criteria, 81% of the differences are small, 15% are moderate, and 4% are large. The large values occur in grades 7 and 8 on CBMreading and CBMmath CAP. These larger differences are most likely due to the relatively small and non-representative samples used to generate the prior norms.

References

Becker, R. A., Chambers, J. M. and Wilks, A. R. (1988) *The New S Language*. Wadsworth & Brooks/Cole.

U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "School Characteristics," 2016–17, Version 1a.

U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Membership," 2016–17, Version 1a.

APPENDIX A

Comparison of benchmarks between prior (2017) and 2019 FAST national norms by assessment, grade, and season.

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
aMath	0	1	high	172	173	-1	-0.15
aMath	0	1	some	177	177	0	0
aMath	0	1	college	183	184	-1	-0.15
aMath	0	2	high	179	179	0	0
aMath	0	2	some	185	184	1	0.14
aMath	0	2	college	188	191	-3	-0.42
aMath	0	3	high	185	182	3	0.41
aMath	0	3	some	189	190	-1	-0.14
aMath	0	3	college	192	195	-3	-0.41
aMath	1	1	high	185	183	2	0.26
aMath	1	1	some	189	188	1	0.13
aMath	1	1	college	192	194	-2	-0.26
aMath	1	2	high	190	188	2	0.27
aMath	1	2	some	193	194	-1	-0.13
aMath	1	2	college	198	199	-1	-0.13
aMath	1	3	high	193	191	2	0.27
aMath	1	3	some	197	198	-1	-0.13
aMath	1	3	college	202	201	1	0.13
aMath	2	1	high	192	191	1	0.13
aMath	2	1	some	197	197	0	0
aMath	2	1	college	201	203	-2	-0.26
aMath	2	2	high	196	195	1	0.14
aMath	2	2	some	201	201	0	0
aMath	2	2	college	205	206	-1	-0.14
aMath	2	3	high	199	197	2	0.28
aMath	2	3	some	203	205	-2	-0.28
aMath	2	3	college	209	209	0	0
aMath	3	1	high	198	196	2	0.27
aMath	3	1	some	203	204	-1	-0.13
aMath	3	1	college	207	209	-2	-0.27
aMath	3	2	high	201	198	3	0.4
aMath	3	2	some	207	207	0	0
aMath	3	2	college	211	213	-2	-0.26
aMath	3	3	high	205	201	4	0.49
aMath	3	3	some	212	209	3	0.37
aMath	3	3	college	215	215	0	0
aMath	4	1	high	202	201	1	0.12

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
aMath	4	1	some	209	209	0	0
aMath	4	1	college	213	214	-1	-0.12
aMath	4	2	high	206	204	2	0.24
aMath	4	2	some	212	211	1	0.12
aMath	4	2	college	216	217	-1	-0.12
aMath	4	3	high	211	205	6	0.59
aMath	4	3	some	217	213	4	0.39
aMath	4	3	college	223	222	1	0.1
aMath	5	1	high	207	205	2	0.21
aMath	5	1	some	214	213	1	0.1
aMath	5	1	college	220	220	0	0
aMath	5	2	high	211	207	4	0.38
aMath	5	2	some	220	216	4	0.38
aMath	5	2	college	225	225	0	0
aMath	5	3	high	214	208	6	0.52
aMath	5	3	some	223	218	5	0.44
aMath	5	3	college	230	229	1	0.09
aMath	6	1	high	210	206	4	0.37
aMath	6	1	some	220	215	5	0.46
aMath	6	1	college	226	224	2	0.19
aMath	6	2	high	214	207	7	0.6
aMath	6	2	some	223	219	4	0.34
aMath	6	2	college	230	229	1	0.09
aMath	6	3	high	215	208	7	0.57
aMath	6	3	some	223	220	3	0.24
aMath	6	3	college	232	231	1	0.08
aMath	7	1	high	210	209	1	0.09
aMath	7	1	some	220	219	1	0.09
aMath	7	1	college	227	229	-2	-0.18
aMath	7	2	high	211	210	1	0.09
aMath	7	2	some	223	222	1	0.09
aMath	7	2	college	230	233	-3	-0.26
aMath	7	3	high	212	210	2	0.16
aMath	7	3	some	223	223	0	0
aMath	7	3	college	232	234	-2	-0.16
aMath	8	1	high	211	212	-1	-0.09
aMath	8	1	some	223	222	1	0.09
aMath	8	1	college	229	234	-5	-0.44
aMath	8	2	high	213	213	0	0
aMath	8	2	some	224	226	-2	-0.17
aMath	8	2	college	231	237	-6	-0.51

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
aMath	8	3	high	214	212	2	0.17
aMath	8	3	some	225	226	-1	-0.08
aMath	8	3	college	233	235	-2	-0.17
aReading	0	1	high	373	369	4	0.15
aReading	0	1	some	387	386	1	0.04
aReading	0	1	college	404	415	-11	-0.42
aReading	0	2	high	391	391	0	0
aReading	0	2	some	417	417	0	0
aReading	0	2	college	434	443	-9	-0.32
aReading	0	3	high	416	414	2	0.07
aReading	0	3	some	435	437	-2	-0.07
aReading	0	3	college	445	455	-10	-0.36
aReading	1	1	high	416	413	3	0.1
aReading	1	1	some	435	435	0	0
aReading	1	1	college	447	457	-10	-0.35
aReading	1	2	high	440	431	9	0.31
aReading	1	2	some	454	455	-1	-0.03
aReading	1	2	college	473	475	-2	-0.07
aReading	1	3	high	453	445	8	0.29
aReading	1	3	some	471	468	3	0.11
aReading	1	3	college	482	484	-2	-0.07
aReading	2	1	high	450	445	5	0.18
aReading	2	1	some	469	469	0	0
aReading	2	1	college	483	488	-5	-0.18
aReading	2	2	high	470	462	8	0.31
aReading	2	2	some	481	481	0	0
aReading	2	2	college	495	499	-4	-0.16
aReading	2	3	high	477	469	8	0.33
aReading	2	3	some	489	490	-1	-0.04
aReading	2	3	college	502	505	-3	-0.12
aReading	3	1	high	475	468	7	0.27
aReading	3	1	some	487	490	-3	-0.12
aReading	3	1	college	501	505	-4	-0.16
aReading	3	2	high	482	477	5	0.21
aReading	3	2	some	497	498	-1	-0.04
aReading	3	2	college	509	512	-3	-0.12
aReading	3	3	high	489	483	6	0.25
aReading	3	3	some	503	503	0	0
aReading	3	3	college	516	517	-1	-0.04
aReading	4	1	high	486	484	2	0.09
aReading	4	1	some	500	502	-2	-0.09

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
aReading	4	1	college	513	517	-4	-0.17
aReading	4	2	high	494	493	1	0.04
aReading	4	2	some	507	509	-2	-0.09
aReading	4	2	college	520	522	-2	-0.09
aReading	4	3	high	499	496	3	0.13
aReading	4	3	some	513	513	0	0
aReading	4	3	college	526	526	0	0
aReading	5	1	high	497	496	1	0.04
aReading	5	1	some	509	513	-4	-0.18
aReading	5	1	college	523	528	-5	-0.22
aReading	5	2	high	503	501	2	0.09
aReading	5	2	some	517	517	0	0
aReading	5	2	college	529	532	-3	-0.14
aReading	5	3	high	507	504	3	0.13
aReading	5	3	some	522	520	2	0.09
aReading	5	3	college	534	536	-2	-0.09
aReading	6	1	high	502	499	3	0.13
aReading	6	1	some	516	517	-1	-0.04
aReading	6	1	college	530	534	-4	-0.17
aReading	6	2	high	508	505	3	0.13
aReading	6	2	some	523	521	2	0.09
aReading	6	2	college	535	537	-2	-0.09
aReading	6	3	high	512	508	4	0.17
aReading	6	3	some	527	524	3	0.13
aReading	6	3	college	539	541	-2	-0.09
aReading	7	1	high	504	505	-1	-0.04
aReading	7	1	some	520	524	-4	-0.17
aReading	7	1	college	535	541	-6	-0.26
aReading	7	2	high	509	511	-2	-0.09
aReading	7	2	some	525	528	-3	-0.13
aReading	7	2	college	537	545	-8	-0.35
aReading	7	3	high	514	513	1	0.04
aReading	7	3	some	531	531	0	0
aReading	7	3	college	543	548	-5	-0.21
aReading	8	1	high	508	510	-2	-0.09
aReading	8	1	some	526	536	-10	-0.44
aReading	8	1	college	540	552	-12	-0.52
aReading	8	2	high	515	519	-4	-0.18
aReading	8	2	some	530	538	-8	-0.35
aReading	8	2	college	541	557	-16	-0.7
aReading	8	3	high	518	519	-1	-0.04

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
aReading	8	3	some	536	541	-5	-0.21
aReading	8	3	college	546	558	-12	-0.51
CBMmath CAP	2	1	high	3	3.3	-0.3	-0.13
CBMmath CAP	2	1	some	5	5.3	-0.3	-0.13
CBMmath CAP	2	1	college	7	7.3	-0.3	-0.13
CBMmath CAP	2	2	high	5	5.3	-0.3	-0.13
CBMmath CAP	2	2	some	7	7.3	-0.3	-0.13
CBMmath CAP	2	2	college	9	9.3	-0.3	-0.13
CBMmath CAP	2	3	high	6	6	0	0
CBMmath CAP	2	3	some	9	8	1	0.42
CBMmath CAP	2	3	college	10	10	0	0
CBMmath CAP	3	1	high	3	3.3	-0.3	-0.12
CBMmath CAP	3	1	some	5	4.7	0.3	0.12
CBMmath CAP	3	1	college	7	6.7	0.3	0.12
CBMmath CAP	3	2	high	5	4.7	0.3	0.11
CBMmath CAP	3	2	some	7	6.7	0.3	0.11
CBMmath CAP	3	2	college	9	9.3	-0.3	-0.11
CBMmath CAP	3	3	high	6	5.3	0.7	0.26
CBMmath CAP	3	3	some	9	8	1	0.37
CBMmath CAP	3	3	college	10	10	0	0
CBMmath CAP	4	1	high	2	1.5	0.5	0.26
CBMmath CAP	4	1	some	3	2.5	0.5	0.26
CBMmath CAP	4	1	college	4	4	0	0
CBMmath CAP	4	2	high	2	2	0	0
CBMmath CAP	4	2	some	3	3.5	-0.5	-0.23
CBMmath CAP	4	2	college	5	5.5	-0.5	-0.23
CBMmath CAP	4	3	high	3	2.5	0.5	0.21
CBMmath CAP	4	3	some	5	4.5	0.5	0.21
CBMmath CAP	4	3	college	7	7	0	0
CBMmath CAP	5	1	high	2	2	0	0
CBMmath CAP	5	1	some	3	3	0	0
CBMmath CAP	5	1	college	4	4.5	-0.5	-0.29
CBMmath CAP	5	2	high	2	2.5	-0.5	-0.25
CBMmath CAP	5	2	some	4	3.5	0.5	0.25
CBMmath CAP	5	2	college	5	5.5	-0.5	-0.25
CBMmath CAP	5	3	high	3	2.5	0.5	0.24
CBMmath CAP	5	3	some	4	4	0	0
CBMmath CAP	5	3	college	6	6	0	0
CBMmath CAP	6	1	high	2	2	0	0
CBMmath CAP	6	1	some	4	3.7	0.3	0.13
CBMmath CAP	6	1	college	--	6	--	--

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
CBMmath CAP	6	2	high	2	2.7	-0.7	-0.31
CBMmath CAP	6	2	some	4	4.7	-0.7	-0.31
CBMmath CAP	6	2	college	6	6.7	-0.7	-0.31
CBMmath CAP	6	3	high	3	3.3	-0.3	-0.13
CBMmath CAP	6	3	some	6	5.7	0.3	0.13
CBMmath CAP	6	3	college	8	7.7	0.3	0.13
CBMmath CAP	7	1	high	2	2	0	0
CBMmath CAP	7	1	some	4	3.3	0.7	0.41
CBMmath CAP	7	1	college	--	4.7	--	--
CBMmath CAP	7	2	high	3.9	2.3	1.6	0.97
CBMmath CAP	7	2	some	5	3.7	1.3	0.79
CBMmath CAP	7	2	college	--	5.3	--	--
CBMmath CAP	7	3	high	4.1	2.7	1.4	0.82
CBMmath CAP	7	3	some	5.2	4.3	0.9	0.53
CBMmath CAP	7	3	college	--	5.7	--	--
CBMmath CAP	8	1	high	2	2	0	0
CBMmath CAP	8	1	some	4	3	1	0.6
CBMmath CAP	8	1	college	--	4.3	--	--
CBMmath CAP	8	2	high	4	2	2	1.27
CBMmath CAP	8	2	some	4.9	3.3	1.6	1.01
CBMmath CAP	8	2	college	--	4.7	--	--
CBMmath CAP	8	3	high	4.1	2.3	1.8	1.05
CBMmath CAP	8	3	some	5.2	4	1.2	0.7
CBMmath CAP	8	3	college	--	5.3	--	--
CBMmath Auto L1	1	1	high	5	2	3	0.21
CBMmath Auto L1	1	1	some	10	10	0	0
CBMmath Auto L1	1	1	college	20	20	0	0
CBMmath Auto L1	1	2	high	15	15	0	0
CBMmath Auto L1	1	2	some	27	28	-1	-0.04
CBMmath Auto L1	1	2	college	40	48	-8	-0.34
CBMmath Auto L1	1	3	high	25	20	5	0.17
CBMmath Auto L1	1	3	some	40	38	2	0.07
CBMmath Auto L1	1	3	college	58	60	-2	-0.07

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
CBMmath Auto L2	2	1	high	5	2	3	0.17
CBMmath Auto L2	2	1	some	10	12	-2	-0.11
CBMmath Auto L2	2	1	college	23	25	-2	-0.11
CBMmath Auto L2	2	2	high	13	10	3	0.13
CBMmath Auto L2	2	2	some	25	25	0	0
CBMmath Auto L2	2	2	college	40	42	-2	-0.09
CBMmath Auto L2	2	3	high	18	15	3	0.11
CBMmath Auto L2	2	3	some	35	32	3	0.11
CBMmath Auto L2	2	3	college	53	52	1	0.04
CBMmath Auto L3	3	1	high	5	2	3	0.2
CBMmath Auto L3	3	1	some	10	8	2	0.14
CBMmath Auto L3	3	1	college	17	18	-1	-0.07
CBMmath Auto L3	3	2	high	10	12	-2	-0.09
CBMmath Auto L3	3	2	some	20	22	-2	-0.09
CBMmath Auto L3	3	2	college	35	38	-3	-0.13
CBMmath Auto L3	3	3	high	18	12	6	0.25
CBMmath Auto L3	3	3	some	30	28	2	0.08
CBMmath Auto L3	3	3	college	45	45	0	0
CBMR	1	1	high	8	6	2	0.06
CBMR	1	1	some	14	14	0	0
CBMR	1	1	college	33	42	-9	-0.25
CBMR	1	2	high	23	16	7	0.18
CBMR	1	2	some	43	37	6	0.16
CBMR	1	2	college	73	74	-1	-0.03
CBMR	1	3	high	45	30	15	0.36
CBMR	1	3	some	71	66	5	0.12

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
CBMR	1	3	college	96	97	-1	-0.02
CBMR	2	1	high	30	22	8	0.2
CBMR	2	1	some	58	56	2	0.05
CBMR	2	1	college	85	87	-2	-0.05
CBMR	2	2	high	61	46	15	0.36
CBMR	2	2	some	87	84	3	0.07
CBMR	2	2	college	115	114	1	0.02
CBMR	2	3	high	79	66	13	0.31
CBMR	2	3	some	106	101	5	0.12
CBMR	2	3	college	130	131	-1	-0.02
CBMR	3	1	high	62	51	11	0.27
CBMR	3	1	some	90	87	3	0.07
CBMR	3	1	college	118	117	1	0.02
CBMR	3	2	high	89	75	14	0.34
CBMR	3	2	some	116	110	6	0.14
CBMR	3	2	college	140	138	2	0.05
CBMR	3	3	high	103	90	13	0.31
CBMR	3	3	some	131	125	6	0.14
CBMR	3	3	college	154	151	3	0.07
CBMR	4	1	high	92	84	8	0.2
CBMR	4	1	some	116	115	1	0.02
CBMR	4	1	college	143	144	-1	-0.02
CBMR	4	2	high	110	101	9	0.22
CBMR	4	2	some	136	133	3	0.07
CBMR	4	2	college	161	161	0	0
CBMR	4	3	high	122	113	9	0.22
CBMR	4	3	some	150	147	3	0.07
CBMR	4	3	college	175	175	0	0
CBMR	5	1	high	107	100	7	0.17
CBMR	5	1	some	133	132	1	0.02
CBMR	5	1	college	158	163	-5	-0.12
CBMR	5	2	high	123	114	9	0.21
CBMR	5	2	some	151	149	2	0.05
CBMR	5	2	college	175	178	-3	-0.07
CBMR	5	3	high	137	127	10	0.23
CBMR	5	3	some	163	162	1	0.02
CBMR	5	3	college	188	192	-4	-0.09
CBMR	6	1	high	116	107	9	0.21
CBMR	6	1	some	142	144	-2	-0.05
CBMR	6	1	college	168	173	-5	-0.12
CBMR	6	2	high	131	123	8	0.18

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
CBMR	6	2	some	159	159	0	0
CBMR	6	2	college	183	188	-5	-0.11
CBMR	6	3	high	144	134	10	0.23
CBMR	6	3	some	172	171	1	0.02
CBMR	6	3	college	199	200	-1	-0.02
CBMR	7	1	high	116	132	-16	-0.39
CBMR	7	1	some	141	166	-25	-0.61
CBMR	7	1	college	171	195	-24	-0.59
CBMR	7	2	high	120	141	-21	-0.51
CBMR	7	2	some	146	177	-31	-0.75
CBMR	7	2	college	177	205	-28	-0.68
CBMR	7	3	high	132	152	-20	-0.46
CBMR	7	3	some	162	187	-25	-0.57
CBMR	7	3	college	187	217	-30	-0.69
CBMR	8	1	high	114	123	-9	-0.22
CBMR	8	1	some	144	155	-11	-0.26
CBMR	8	1	college	168	186	-18	-0.43
CBMR	8	2	high	120	125	-5	-0.11
CBMR	8	2	some	150	161	-11	-0.25
CBMR	8	2	college	172	190	-18	-0.4
CBMR	8	3	high	136	147	-11	-0.27
CBMR	8	3	some	164	177	-13	-0.32
CBMR	8	3	college	190	207	-17	-0.42
earlyMath	0	1	high	24	18	6	0.42
earlyMath	0	1	some	33	29	4	0.28
earlyMath	0	1	college	43	40	3	0.21
earlyMath	0	2	high	42	36	6	0.34
earlyMath	0	2	some	55	50	5	0.29
earlyMath	0	2	college	68	64	4	0.23
earlyMath	0	3	high	57	50	7	0.4
earlyMath	0	3	some	70	65	5	0.29
earlyMath	0	3	college	81	79	2	0.12
earlyMath	1	1	high	18	4	14	0.46
earlyMath	1	1	some	37	28	9	0.3
earlyMath	1	1	college	59	56	3	0.1
earlyMath	1	2	high	40	29	11	0.48
earlyMath	1	2	some	56	51	5	0.22
earlyMath	1	2	college	70	69	1	0.04
earlyMath	1	3	high	50	41	9	0.43
earlyMath	1	3	some	64	60	4	0.19
earlyMath	1	3	college	76	74	2	0.09

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
Decomposing G1	1	1	high	1	1	0	0
Decomposing G1	1	1	some	4	3	1	0.3
Decomposing G1	1	1	college	6	6	0	0
Decomposing G1	1	2	high	5	3	2	0.49
Decomposing G1	1	2	some	7	7	0	0
Decomposing G1	1	2	college	10	10	0	0
Decomposing G1	1	3	high	6	5	1	0.22
Decomposing G1	1	3	some	9	8	1	0.22
Decomposing G1	1	3	college	12	12	0	0
Decomposing KG	0	2	high	3	2	1	0.4
Decomposing KG	0	2	some	5	4	1	0.4
Decomposing KG	0	2	college	7	7	0	0
Decomposing KG	0	3	high	5	4	1	0.47
Decomposing KG	0	3	some	6	6	0	0
Decomposing KG	0	3	college	8	8	0	0
Numeral ID G1	1	1	high	20	16	4	0.38
Numeral ID G1	1	1	some	29	26	3	0.29
Numeral ID G1	1	1	college	35	34	1	0.1
Numeral ID KG	0	1	high	8	5	3	0.28
Numeral ID KG	0	1	some	13	12	1	0.09
Numeral ID KG	0	1	college	21	19	2	0.19
Numeral ID KG	0	2	high	16	13	3	0.22
Numeral ID KG	0	2	some	25	22	3	0.22
Numeral ID KG	0	2	college	35	33	2	0.15
Numeral ID KG	0	3	high	26	21	5	0.35
Numeral ID KG	0	3	some	36	32	4	0.28
Numeral ID KG	0	3	college	47	44	3	0.21
EMATHmatchq	0	1	high	6	4	2	0.51

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
EMATHmatchq	0	1	some	8	7	1	0.26
EMATHmatchq	0	1	college	10	10	0	0
Number Seq G1	1	1	high	3	2	1	0.27
Number Seq G1	1	1	some	6	5	1	0.27
Number Seq G1	1	1	college	9	8	1	0.27
Number Seq G1	1	2	high	6	5	1	0.27
Number Seq G1	1	2	some	10	8	2	0.55
Number Seq G1	1	2	college	12	12	0	0
Number Seq KG	0	1	high	2	1	1	0.3
Number Seq KG	0	1	some	5	4	1	0.3
Number Seq KG	0	1	college	7	7	0	0
Number Seq KG	0	2	high	6	5	1	0.33
Number Seq KG	0	2	some	8	7	1	0.33
Number Seq KG	0	2	college	10	10	0	0
Number Seq KG	0	3	high	8	7	1	0.37
Number Seq KG	0	3	some	10	9	1	0.37
Number Seq KG	0	3	college	12	11	1	0.37
Place Value	1	3	high	3	3	0	0
Place Value	1	3	some	4	4	0	0
Place Value	1	3	college	5	6	-1	-0.61
Story Problems	1	3	high	3	3	0	0
Story Problems	1	3	some	5	4	1	0.61
Story Problems	1	3	college	6	6	0	0
Print Concepts	0	1	high	6	5	1	0.36
Print Concepts	0	1	some	8	7	1	0.36
Print Concepts	0	1	college	10	9	1	0.36

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
earlyReading Comp.	0	1	high	30	28	2	0.36
earlyReading Comp.	0	1	some	34	32	2	0.36
earlyReading Comp.	0	1	college	38	37	1	0.18
earlyReading Comp.	0	2	high	46	42	4	0.44
earlyReading Comp.	0	2	some	52	50	2	0.22
earlyReading Comp.	0	2	college	58	56	2	0.22
earlyReading Comp.	0	3	high	59	56	3	0.25
earlyReading Comp.	0	3	some	65	64	1	0.08
earlyReading Comp.	0	3	college	72	72	0	0
earlyReading Comp.	1	1	high	27	25	2	0.11
earlyReading Comp.	1	1	some	34	33	1	0.05
earlyReading Comp.	1	1	college	46	49	-3	-0.16
earlyReading Comp.	1	2	high	42	36	6	0.25
earlyReading Comp.	1	2	some	55	52	3	0.12
earlyReading Comp.	1	2	college	71	72	-1	-0.04
earlyReading Comp.	1	3	high	53	44	9	0.33
earlyReading Comp.	1	3	some	68	66	2	0.07
earlyReading Comp.	1	3	college	85	88	-3	-0.11
Letter Names	0	1	high	7	3	4	0.24
Letter Names	0	1	some	20	14	6	0.35
Letter Names	0	1	college	33	31	2	0.12
Letter Sounds	0	1	high	1	0	1	0.1
Letter Sounds	0	1	some	5	3	2	0.19
Letter Sounds	0	1	college	13	12	1	0.1
Letter Sounds	0	2	high	18	13	5	0.31
Letter Sounds	0	2	some	29	26	3	0.19

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
Letter Sounds	0	2	college	41	38	3	0.19
Letter Sounds	0	3	high	30	27	3	0.17
Letter Sounds	0	3	some	41	41	0	0
Letter Sounds	0	3	college	51	53	-2	-0.12
Nonsense Words	0	2	high	3	2	1	0.14
Nonsense Words	0	2	some	8	6	2	0.28
Nonsense Words	0	2	college	12	12	0	0
Nonsense Words	0	3	high	8	6	2	0.21
Nonsense Words	0	3	some	12	12	0	0
Nonsense Words	0	3	college	17	18	-1	-0.11
Nonsense Words	1	1	high	5	4	1	0.09
Nonsense Words	1	1	some	9	10	-1	-0.09
Nonsense Words	1	1	college	14	16	-2	-0.18
Nonsense Words	1	2	high	11	10	1	0.07
Nonsense Words	1	2	some	16	17	-1	-0.07
Nonsense Words	1	2	college	24	27	-3	-0.22
Nonsense Words	1	3	high	15	13	2	0.13
Nonsense Words	1	3	some	21	22	-1	-0.06
Nonsense Words	1	3	college	31	34	-3	-0.19
Onset Sounds	0	1	high	7	5	2	0.43
Onset Sounds	0	1	some	12	11	1	0.21
Onset Sounds	0	1	college	15	15	0	0
Onset Sounds	0	2	high	14	13	1	0.36
Onset Sounds	0	2	some	16	16	0	0
Onset Sounds	0	2	college	16	16	0	0
Sent. Reading	1	1	high	8	4	4	0.14
Sent. Reading	1	1	some	14	12	2	0.07
Sent. Reading	1	1	college	33	31	2	0.07

Assessment	Grade	Season	Risk	2017	2019	Difference	Effect Size
Sight Words	0	3	high	8	4	4	0.16
Sight Words	0	3	some	20	13	7	0.28
Sight Words	0	3	college	42	36	6	0.24
Sight Words	1	1	high	6	5	1	0.04
Sight Words	1	1	some	17	16	1	0.04
Sight Words	1	1	college	42	47	-5	-0.19
Sight Words	1	2	high	31	19	12	0.43
Sight Words	1	2	some	50	49	1	0.04
Sight Words	1	2	college	68	69	-1	-0.04
Sight Words	1	3	high	50	40	10	0.37
Sight Words	1	3	some	67	65	2	0.07
Sight Words	1	3	college	81	83	-2	-0.07
Word Segmenting	0	2	high	17	10	7	0.72
Word Segmenting	0	2	some	26	25	1	0.1
Word Segmenting	0	2	college	30	30	0	0
Word Segmenting	0	3	high	26	24	2	0.28
Word Segmenting	0	3	some	30	30	0	0
Word Segmenting	0	3	college	32	32	0	0
Word Segmenting	1	1	high	22	22	0	0
Word Segmenting	1	1	some	27	28	-1	-0.14
Word Segmenting	1	1	college	30	31	-1	-0.14
Word Segmenting	1	2	high	27	27	0	0
Word Segmenting	1	2	some	31	31	0	0
Word Segmenting	1	2	college	33	33	0	0
Word Segmenting	1	3	high	29	28	1	0.24
Word Segmenting	1	3	some	32	32	0	0
Word Segmenting	1	3	college	34	34	0	0