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# School-Level Growth Estimates for the SAT<sup>®</sup> Suite of Assessments

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## Executive Summary

The goal of this report is to present school-level growth estimates for the SAT<sup>®</sup> Suite of Assessments. These results extend an earlier study of student-level growth results (Kim, Moses, & Zhang, in press), and show growth estimates in high school means for seven groups defined by the grade levels of the students in the schools (9th–12th grade), testing period (fall and spring), and tests taken (SAT, PSAT/NMSQT<sup>®</sup>, PSAT<sup>™</sup> 10, and PSAT<sup>™</sup> 8/9). Compared to the corresponding and previously reported student-level results, the school-level growth results reflect the following:

- Conditional means of the school-level means that are similar to those of the student-level scores,
- Conditional standard deviations of the school-level means that are smaller than those of the student-level scores,
- Conditional growth ranges of the school-level means that are narrower than those of the student-level scores.

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## Overview

The SAT Suite of Assessments was designed such that the SAT and PSAT-related assessments measure a common domain of knowledge and skills that are directly aligned with college and career readiness, at difficulty levels considered appropriate for specific high school grades, with reported scale scores that are vertically aligned across the SAT Suite (College Board, 2017)<sup>1</sup>. The design of the SAT Suite is intended to support evaluations of student growth, as described on College Board websites: “The redesigned SAT Suite uses a common score scale, providing consistent feedback across assessments to help educators and students monitor growth across grades and to identify areas in need of improvement.” (College Board, n.d.).

Basing the SAT Suite on a vertical scale also:

... allows for appropriate inferences of student growth and progress toward being on-track for college and career readiness from year to year prior to taking the SAT. One is then able to make statements about a student’s level of preparedness for college and career based on SAT performance (College Board, 2017, p. 4).

The College Board has established SAT Suite growth reporting groups, identified an appropriate methodology for reporting growth across the SAT Suite, and provided the results of the growth estimates at the student-level (Kim, Moses, & Zhang, in press). As an extension to the study of the student-level growth, the goals of this report are to examine the methodology to estimate school-level growth and to provide the results of the school-level growth estimates for SAT Suite growth reporting groups.

## Method

### Data

School-level growth will be reported on the Evidence-Based Reading and Writing (ERW) and Math section scores for each program in the SAT Suite. School-level growth measures are estimated based on the groups of schools with students who, while at the same school, took two tests, a *prior* and a *current* test within the SAT Suite of Assessments (e.g., students taking both SAT and PSAT/NMSQT) at particular times (e.g., fall, spring), in particular grades (i.e., 8th–12th grade). Given a school, school-level growth tracks changes in its students’ average scores between the prior and current tests, where the averages are rounded to the nearest 10. Thus, measuring school-level growth requires students to stay in

<sup>1</sup> Many of the basic ideas about the methodology used for scaling the SAT Suite are discussed in Kolen and Brennan (2014, Section 9.10). In particular, for the SAT Suite a domain definition of growth was employed with a scaling test design. Assuming learning occurs from grade to grade, this methodology ensures that learning does lead to increasing scores from grade to grade. This may seem obvious, but not all scaling methodologies have this characteristic.

the same school between two testing times. Table 1 shows the nine growth reporting groups for the SAT Suite considered in the student-level growth study based on specific grade levels and the timing of the first and second tests (Kim, et al., in press). Because a majority of students tend to switch their schools from 8th to 9th grade, it was decided among the nine growth reporting groups not to report school-level growth estimates for Groups 1 and 5, which involves the growth from 8th to 9th grade.

To minimize the impact of outliers on the growth estimates, only K–12 schools were included in the analysis, and thus special institutions (e.g., scholarship foundations) were not included. To compute the average of students' scores for each school, students with missing school codes were excluded. In addition, among those who had valid school codes, only the students with reportable scores who responded to at least one item on each of the three tests—Reading, Writing and Language, and Math—for both prior and current assessments were included in the analysis. For those who had multiple SAT scores from the fall administration (i.e., October, November, or December administrations) or the spring administration (i.e., January, March, May, or June administrations), only their most recent score was used in the analysis.

Table 2 shows the summary statistics for the school means of the seven school-level growth reporting groups. Group 8 has the largest sample size, followed by Group 9 and then by Group 4. The fall-to-fall groups had much larger sample sizes than did the spring-to-spring groups. Overall growth is computed as the average score change from prior to current assessments. In general, the average school-level growth estimates were very similar to the average student-level growth estimates. On the other hand, the standard deviations of the school-level growth estimates were almost half of the standard deviations of the student-level growth estimates. Thus, a projected range of typical growth at school level, which is based on the conditional mean of the current test scores plus or minus the conditional standard deviation at a prior test score, should be much narrower than the range of student-level growth. The correlations between prior and current tests in the school-level growth estimates were higher than the ones in the student-level growth estimates.

### **Growth measures: Conditional means and standard deviations of the school means**

The methodology used for student-level growth reporting in the SAT Suite is also considered for school-level growth reporting. The methodology provides schools with a projected range of “typical” growth based on the conditional mean of the current test score means plus or minus the conditional standard deviation at a prior test score. To address irregularities in the score mean distributions due to sampling errors and also to produce score ranges for growth even when a prior test score is not observed in the data, the B-spline smoothing method with quantile regression was considered. The conditional means and conditional standard deviations of the current test score means were estimated at each prior score using the outputs from the smoothing method.

For this smoothing method, the prior test scores were converted into B-spline basis functions that are piecewise polynomial functions with  $d$  degrees that divide the scores into  $k$  equally spaced intervals or knots (SAS Institute, 2008). These B-spline basis functions allow for fitting curvilinearity and other complexities in the growth estimates. Then 999 ( $q = 0.001, 0.002, \dots, 0.999$ ) equally spaced conditional quantiles of the current test scores were estimated in regressions of the B-spline basis functions of the prior test scores. Finally, because the equally spaced smoothed conditional quantiles imply that these estimates reflect a conditional uniform distribution, the smoothed conditional means and standard deviations were obtained as unweighted averages and standard deviations of the conditional quantile scores. To find the model that fits the data best, the following B-spline smoothing models were examined by varying the number of knots ( $k$ ) and degrees ( $d$ ):  $k1d2$ ,  $k2d2$ ,  $k2d3$ ,  $k3d2$ ,  $k3d3$ , and  $k4d3$ .

## Results

### Evaluations for the B-spline Smoothing Model

Figures 1–14 show the results of school-level growth estimates for the ERW section score means of the seven groups. The conditional means (Figures 1–7) and the conditional standard deviations (Figures 8–14) were estimated based on unsmoothed conditional score mean distributions as well as smoothed conditional score mean distributions using the six B-spline smoothing models.

Figures 15–28 show the results of growth estimates for the Math section score means of the seven groups. The conditional means (Figures 15–21) and the conditional standard deviations (Figures 22–28) were estimated based on unsmoothed conditional score mean distributions as well as smoothed conditional score mean distributions using the six B-spline smoothing models.

In terms of the model selection criterion, the smoothing model that best fit the conditional means and standard deviations of the current test score means was preferred. Comparing the six B-spline smoothing models, it was found that all models provided different results for the lower or higher ends of the score mean distributions. Because the model with  $k4d3$  appeared to fit the conditional means and standard deviations of the prior scores with reasonable frequencies better than other models, the model with  $k4d3$  was selected as the final smoothing model to estimate school-level growth. Note that the B-spline functions with  $k4d3$  was also used for the student-level growth estimation (Kim, et al., in press). Although the model with  $k4d3$  seemed to fit the data best, no model fit the prior scores that had a frequency of 0 or 1 well, because the conditional means and standard deviations for those scores are not identified.

The overall patterns of estimated conditional means and standard deviations in the school-level growth analysis were consistent with the ones found in the student-level growth analysis. For the scores with no missing frequencies, the conditional means of the current



test score means increased curvilinearly as prior scores increased. The conditional standard deviations of the current test score means frequently decreased curvilinearly as prior scores increased. Generally, there were larger variabilities at the lower end of the score distributions for all seven groups. This implies that the projected score range of the current test score means narrows for schools with higher scores on the prior test.

Because all seven groups did not have any frequencies for several prior scores at the lower end of the score mean distributions, the growth estimates were not identified and some manual adjustments were applied. Furthermore, three groups with small sample sizes—Group 2 (N = 2,129), Group 6 (N = 1,110), and Group 7 (N = 2,268)—had larger variabilities at the higher end of the score distributions as well as the lower end of the score mean distributions, mainly due to the lack of the data in both ends of the score mean distributions. Thus, additional manual adjustments for the upper end of the score mean distributions were required for these three groups. In the next section, the manual adjustment procedures are explained.

Although there were large variabilities at the lower and higher ends of the score mean distributions, mainly due to small sample sizes, overall the conditional means and standard deviations based on the selected B-spline smoothing model were very close to the ones based on the unsmoothed score mean distributions.

### **Growth Estimates and Adjustment Procedures for Missing School Data**

Once the conditional score mean distributions of the current test were smoothed using B-spline smoothing, the conditional mean of the current score means plus or minus the conditional standard deviation at a prior score were computed, rounded to reporting score units of 10, and truncated to the minimum and maximum possible score ranges (200–800 for SAT, 160–760 for PSAT/NMSQT and PSAT 10, and 120–720 for PSAT 8/9). Tables 3 to 9 show the results of the conditional means (rounded to units of 10) and the conditional standard deviations (SD, rounded to integers), as well as the projected score ranges of the ERW and Math section scores for the seven groups (rounded to units of 10). Each table shows all possible prior scores, the number of students, the conditional mean and standard deviation, the conditional mean minus one standard deviation (Lower Bound), and the conditional mean plus one standard deviation (Upper Bound), at each prior ERW and Math score.

Although the selected B-spline smoothing model fit the conditional school mean distributions well, conditional means and standard deviations at the lower end of the prior section scores were not identified for all seven school-level growth reporting groups, because there were very few or no schools at the lower end of the scores. For rounded and averaged prior scores with no schools, the conditional means of the current score means were undefined. For rounded and averaged prior scores with one school, the conditional standard deviations of the current score means were undefined.

To address the nonidentification issue, the conditional means and standard deviations for the lowest prior scores with fewer than five schools were extrapolated using the information from the lowest prior scores for which conditional means and standard deviations could be estimated. Likewise, the conditional means and standard deviations for the highest prior scores with fewer than five schools were extrapolated using the information from the highest prior scores for which conditional means and standard deviations could be estimated. The lowest or highest prior scores with extrapolated conditional means and standard deviations are underlined in the tables.

For example, for Group 7 schools containing the PSAT10 10th-grade spring to SAT 11th-grade spring test takers, there were fewer than five schools at ERW scores between 160 and 320 and also between 690 and 760 (Table 7). For the ERW prior scores of 320 or lower, the unrounded conditional means were estimated by adding the model estimated growth for ERW score of 330 (i.e., about 60 points) to the prior scores and the conditional standard deviations were replaced with the model estimated unrounded conditional standard deviation for ERW score of 330 (i.e., about 35). For the ERW prior scores of 690 or higher, the conditional means were estimated by adding the model estimated growth for ERW score of 680 (i.e., about 30 points) to the prior scores and the conditional standard deviations were replaced with the model estimated conditional standard deviation for ERW score of 680 (i.e., about 27 points). Figures 29 and 30 show the results before and after adjustments.

Because the growth measures tend to be associated with assumptions and interpretations of normality, normality assumptions with the growth estimates were evaluated based on how closely the interpretations agreed with the actual growth ranges. Because the Lower-Upper ranges of growth were obtained from  $\pm 1$  conditional standard deviation from the conditional mean, it can be said that approximately 68% of schools with a given prior score had growth within the Lower-Upper ranges if the current score means at a given prior score are normally distributed. To check whether the Lower-Upper ranges indeed contain the middle 68% of schools with a given prior score, the 16th and 84th percentiles for the current score mean distribution given a prior score, which include approximately 68% of the distribution, were examined. Figures 31 (ERW) and 32 (Math) show the Lower and Upper ranges and the 16th and 84th percentiles for Group 3, the schools with students who took the PSAT/NMSQT in fall 2015 as 10th graders and also in fall 2016 as 11th graders. The lines based on the Lower and Upper ranges and the 16th and 84th percentiles were very close and were almost on top of each other across most scores, with exceptions at the highest and lowest prior scores. Similar patterns were observed for the other six groups. These results indicate that most of the Lower and Upper growth ranges roughly reflect the middle 68% of schools with a given prior score.

## Discussion

The purpose of this report was to describe school-level growth for seven growth reporting groups defined by grade levels, fall and spring time periods, and tests in the SAT Suite.

Compared to the corresponding and previously reported student-level results (Kim, et al., in press), these school-level results reflect the following:

- Seven rather than nine reporting groups (i.e., no growth reporting for schools with the same students in 8th and 9th grade)
- Conditional means of the school-level means that are similar to those of the student-level scores
- Conditional standard deviations of the school-level means that are smaller than those of the student-level scores
- Conditional growth ranges of the school-level means that are narrower than those of the student-level scores

These school-level growth reporting results indicate typical growth in school-level means based on recent data for the SAT Suite. Over time, the expected growth tables will be updated on a routine basis using the most recent assessment data available. These updates are planned for all school-level growth tables and growth groups, though the ones in most need of updates are those with schools and students taking SAT Suite tests in the spring.

**Table 1: The SAT Suite Growth Measure Reporting Groups**

<b>Year/Semester</b>	<b>Group No.</b>	<b>Time 1: Prior Test Assessment/Grade Level</b>	<b>Time 2: Current Test Assessment/Grade Level</b>
2015 Fall to 2016 Fall	1	PSAT 8/9 8th	PSAT 8/9 9th
	2	PSAT 8/9 9th	PSAT/NMSQT 10th
	3	PSAT/NMSQT 10th	PSAT/NMSQT 11th
	4	PSAT/NMSQT 11th	SAT 12th
2016 Spring to 2017 Spring	5	PSAT 8/9 8th	PSAT 8/9 9th
	6	PSAT 8/9 9th	PSAT 10 10th
	7	PSAT 10 10th	SAT 11th
2016 Fall to 2017 Spring	8	PSAT/NMSQT 11th	SAT 11th
2016 Spring to 2016 Fall	9	SAT 11th	SAT 12th

**Table 2: School-Level Means, Standard Deviations, Intercorrelations, and Overall Growth for the ERW and Math Section Scores**

<b>2015 Fall to 2016 Fall</b>		<b>ERW</b>			<b>Math</b>			
Group 2: N = 2,129	PSAT 8/9 9th	PSAT/NMSQT 10th	Corr.	Overall Growth	PSAT 8/9 9th	PSAT/NMSQT 10th	Corr.	Overall Growth
Mean	456.87	486.5	0.96	29.63	444.16	472.11	0.94	27.94
SD	55.26	61.16		16.93	52.02	54.89		18.41
Group 3: N = 15,725	PSAT/NMSQT 10th	PSAT/NMSQT 11th	Corr.	Overall Growth	PSAT/NMSQT 10th	PSAT/NMSQT 11th	Corr.	Overall Growth
Mean	513.64	547.22	0.96	33.59	498.72	530.97	0.93	32.25
SD	66.9	71.03		20.16	62.66	69.37		24.91
Group 4: N = 16,680	PSAT/NMSQT 11th	SAT 12th	Corr.	Overall Growth	PSAT/NMSQT 11th	SAT 12th	Corr.	Overall Growth
Mean	530.83	568.58	0.94	37.75	522.58	556.66	0.93	34.08
SD	71.23	69.66		25.42	72.05	74.75		27.79
<b>2016 Spring to 2017 Spring</b>								
Group 6: N = 1,110	PSAT 8/9 9th	PSAT 10 10th	Corr.	Overall Growth	PSAT 8/9 9th	PSAT 10 10th	Corr.	Overall Growth
Mean	438.74	461.82	0.93	23.07	422.81	450.03	0.9	27.23
SD	51	58.75		22.13	50.34	53.09		22.8
Group 7: N = 2,268	PSAT 10 10th	SAT 11th	Corr.	Overall Growth	PSAT 10 10th	SAT 11th	Corr.	Overall Growth
Mean	476.53	516.41	0.95	39.88	467.38	503.36	0.93	35.98
SD	67.49	73.65		23.61	62.6	81.13		32.11
<b>2016 Fall to 2017 Spring</b>								
Group 8: N = 17,008	PSAT/NMSQT 11th	SAT 11th	Corr.	Overall Growth	PSAT/NMSQT 11th	SAT 11th	Corr.	Overall Growth
Mean	549.64	570.87	0.96	21.22	536.32	561.97	0.95	25.64
SD	70.26	69.59		20.91	69.86	75.93		23.69
<b>2016 Spring to 2016 Fall</b>								
Group 9: N = 16,792	SAT 11th	SAT 12th	Corr.	Overall Growth	SAT 11th	SAT 12th	Corr.	Overall Growth
Mean	550.59	565.53	0.93	14.94	547.23	559.89	0.94	12.66
SD	65.37	65.51		24.27	74.36	76.03		25.06

**Table 3: PSAT 8/9 9th Fall -to- PSAT/NMSQT 10th Fall Expected Score Range**

PSAT 8/9 9th	ERW Section				Math Section			
	N	PSAT/ NMSQT 10th Mean	PSAT/ NMSQT 10th SD	PSAT/ NMSQT 10th Lower-Upper Bound	N	PSAT/ NMSQT 10th Mean	PSAT/ NMSQT 10th SD	PSAT/ NMSQT 10th Lower-Upper Bound
120	-	160	21	160 - 170	-	160	36	160 - 200
130	-	160	21	160 - 180	-	170	36	160 - 210
140	-	170	21	160 - 190	-	180	36	160 - 220
150	-	180	21	160 - 200	1	190	36	160 - 230
160	-	190	21	170 - 210	-	200	36	170 - 240
170	-	200	21	180 - 220	-	210	36	180 - 250
180	-	210	21	190 - 230	-	220	36	190 - 260
190	-	220	21	200 - 240	-	230	36	200 - 270
200	-	230	21	210 - 250	1	240	36	210 - 280
210	-	240	21	220 - 260	-	250	36	220 - 290
220	1	250	21	230 - 270	-	260	36	230 - 300
230	-	260	21	240 - 280	-	270	36	240 - 310
240	-	270	21	250 - 290	-	280	36	250 - 320
250	1	280	21	260 - 300	-	290	36	260 - 330
260	-	290	21	270 - 310	-	300	36	270 - 340
270	-	300	21	280 - 320	-	310	36	280 - 350
280	-	310	21	290 - 330	2	320	36	290 - 360
290	-	320	21	300 - 340	2	330	36	300 - 370
300	1	330	21	310 - 350	1	340	36	310 - 380
310	3	340	21	320 - 360	4	350	36	320 - 390
320	4	350	21	330 - 370	5	360	36	330 - 400
330	11	360	21	340 - 380	4	370	31	340 - 400
340	26	360	19	350 - 380	25	370	26	350 - 400
350	29	370	18	360 - 390	33	380	22	360 - 400
360	51	380	17	370 - 400	47	390	19	370 - 410
370	47	390	17	380 - 410	54	400	16	380 - 410
380	60	400	16	390 - 420	74	410	15	390 - 420
390	75	410	16	400 - 430	102	410	14	400 - 430
400	68	420	16	410 - 440	114	420	14	410 - 440
410	108	440	16	420 - 450	133	440	14	420 - 450
420	99	450	16	430 - 460	131	450	14	430 - 460
430	119	460	16	440 - 470	151	460	15	440 - 470
440	134	470	16	450 - 480	188	470	15	450 - 480
450	150	480	15	460 - 490	190	480	16	460 - 490
460	153	490	15	470 - 500	187	490	16	470 - 500
470	156	500	15	490 - 520	129	500	16	480 - 520
480	151	510	14	500 - 530	135	510	17	490 - 530
490	156	520	14	510 - 540	98	520	17	500 - 540
500	142	530	14	520 - 550	82	530	18	510 - 550
510	109	540	15	530 - 560	66	540	19	520 - 560
520	73	550	15	540 - 570	55	550	20	530 - 570
530	57	560	16	550 - 580	33	560	21	540 - 580
540	49	570	17	560 - 590	27	570	22	550 - 590
550	34	590	19	570 - 600	13	580	24	560 - 600
560	18	600	20	580 - 620	15	590	25	570 - 620
570	12	610	22	590 - 630	5	600	27	570 - 630
580	7	620	24	600 - 640	4	610	29	580 - 640
590	5	630	26	600 - 660	4	620	30	590 - 650
600	6	640	27	610 - 670	2	630	32	600 - 670
610	4	650	27	620 - 680	5	640	34	610 - 680
620	4	660	27	630 - 690	-	650	34	620 - 690
630	3	670	27	640 - 700	1	660	34	630 - 700
640	1	680	27	650 - 710	1	670	34	640 - 710
650	-	690	27	660 - 720	1	680	34	650 - 720
660	2	700	27	670 - 730	-	690	34	660 - 730
670	-	710	27	680 - 740	1	700	34	670 - 740
680	-	720	27	690 - 750	-	710	34	680 - 750
690	-	730	27	700 - 760	-	720	34	690 - 760
700	-	740	27	710 - 760	1	730	34	700 - 760
710	-	750	27	720 - 760	-	740	34	710 - 760
720	-	760	27	730 - 760	2	750	34	720 - 760

Note. The results at the lowest scores below the first underline were manually adjusted conditional means, standard deviations, and ranges. Results for the highest scores above the second underline were also manually adjusted.

**Table 4: PSAT/NMSQT 10th Fall -to- PSAT/NMSQT 11th Fall Expected Score Range**

PSAT/ NMSQT 10th	ERW Section				Math Section			
	N	PSAT/NMSQT 11th Mean	PSAT/ NMSQT 11th SD	PSAT/ NMSQT 11th Lower-Upper Bound	N	PSAT/ NMSQT 11th Mean	PSAT/ NMSQT 11th SD	PSAT/ NMSQT 11th Lower-Upper Bound
160	-	190	35	160 - 230	-	230	54	180 - 290
170	-	200	35	170 - 240	-	240	54	190 - 300
180	-	210	35	180 - 250	1	250	54	200 - 310
190	-	220	35	190 - 260	-	260	54	210 - 320
200	-	230	35	200 - 270	-	270	54	220 - 330
210	-	240	35	210 - 280	-	280	54	230 - 340
220	-	250	35	220 - 290	-	290	54	240 - 350
230	-	260	35	230 - 300	-	300	54	250 - 360
240	-	270	35	240 - 310	1	310	54	260 - 370
250	-	280	35	250 - 320	3	320	54	270 - 380
260	1	290	35	260 - 330	-	330	54	280 - 390
270	-	300	35	270 - 340	3	340	54	290 - 400
280	-	310	35	280 - 350	1	350	54	300 - 410
290	3	320	35	290 - 360	4	360	54	310 - 420
300	4	330	35	300 - 370	-	370	54	320 - 430
310	7	340	35	310 - 380	18	380	54	330 - 440
320	10	350	32	320 - 380	2	380	51	330 - 430
330	10	360	30	330 - 390	15	390	49	340 - 430
340	22	370	28	340 - 390	12	390	46	340 - 430
350	62	370	27	350 - 400	36	390	44	350 - 430
360	87	380	26	360 - 410	44	400	41	350 - 440
370	131	390	25	370 - 420	76	400	38	360 - 440
380	169	410	25	380 - 430	140	410	36	370 - 440
390	203	420	24	390 - 440	230	410	33	380 - 450
400	245	430	24	400 - 450	280	420	31	390 - 450
410	292	440	23	420 - 460	380	430	29	400 - 460
420	330	450	22	430 - 470	505	440	27	420 - 470
430	418	460	22	440 - 480	544	450	25	430 - 480
440	416	470	21	450 - 490	673	470	24	440 - 490
450	507	480	20	460 - 500	786	480	23	460 - 500
460	574	490	20	470 - 510	885	490	22	470 - 510
470	710	500	19	480 - 520	1,031	500	22	480 - 520
480	817	510	19	500 - 530	1,033	510	21	490 - 530
490	833	520	18	510 - 540	1,035	520	21	500 - 540
500	928	530	18	520 - 550	1,047	530	21	510 - 560
510	1,002	540	17	530 - 560	989	540	21	520 - 570
520	1,032	560	17	540 - 570	980	550	21	530 - 580
530	996	570	17	550 - 580	844	560	22	540 - 590
540	925	580	17	560 - 590	778	580	22	550 - 600
550	882	590	17	570 - 600	649	590	23	560 - 610
560	729	600	18	580 - 610	541	600	24	570 - 620
570	693	610	18	590 - 620	458	610	25	580 - 630
580	565	620	19	600 - 630	399	620	26	590 - 640
590	473	630	19	610 - 650	304	630	27	600 - 650
600	392	640	20	620 - 660	220	640	28	610 - 660
610	314	640	21	620 - 670	170	650	29	620 - 680
620	239	650	22	630 - 680	137	660	29	630 - 690
630	178	660	23	640 - 690	114	670	30	640 - 700
640	131	670	24	650 - 690	70	670	31	640 - 710
650	86	680	25	650 - 700	66	680	31	650 - 710
660	74	690	26	660 - 710	39	690	32	660 - 720
670	63	690	27	670 - 720	25	700	32	670 - 730
680	44	700	27	670 - 730	36	710	32	670 - 740
690	36	710	27	680 - 730	23	710	31	680 - 740
700	29	710	26	690 - 740	22	720	30	690 - 750
710	28	720	25	690 - 740	25	730	29	700 - 750
720	14	720	22	700 - 750	14	730	27	700 - 760
730	10	730	19	710 - 750	11	740	24	710 - 760
740	7	740	15	720 - 750	7	740	21	720 - 760
750	4	750	15	730 - 760	12	750	18	730 - 760
760	-	760	15	740 - 760	7	750	14	740 - 760

Note. The results at the lowest scores below the first underline were manually adjusted conditional means, standard deviations, and ranges. Results for the highest scores above the second underline were also manually adjusted.

**Table 5: PSAT/NMSQT 11th Fall -to- SAT 12th Fall Expected Score Range**

PSAT/NMSQT 11th	ERW Section				Math Section			
	N	SAT 12th Mean	SAT 12th SD	SAT 12th Lower-Upper Bound	N	SAT 12th Mean	SAT 12th SD	SAT 12th Lower-Upper Bound
160	-	240	44	200 - 280	-	250	53	200 - 300
170	-	250	44	210 - 290	-	260	53	200 - 310
180	-	260	44	220 - 300	-	270	53	210 - 320
190	-	270	44	230 - 310	-	280	53	220 - 330
200	-	280	44	240 - 320	-	290	53	230 - 340
210	-	290	44	250 - 330	-	300	53	240 - 350
220	1	300	44	260 - 340	-	310	53	250 - 360
230	-	310	44	270 - 350	3	320	53	260 - 370
240	-	320	44	280 - 360	-	330	53	270 - 380
250	1	330	44	290 - 370	3	340	53	280 - 390
260	-	340	44	300 - 380	-	350	53	290 - 400
270	1	350	44	310 - 390	2	360	53	300 - 410
280	1	360	44	320 - 400	1	370	53	310 - 420
290	2	370	44	330 - 410	3	380	53	320 - 430
300	4	380	44	340 - 420	4	390	53	330 - 440
310	-	390	44	350 - 430	5	400	53	340 - 450
320	5	400	44	360 - 440	5	400	52	350 - 450
330	10	400	43	360 - 450	12	400	51	350 - 450
340	17	410	41	370 - 450	10	400	49	350 - 450
350	30	410	39	370 - 450	30	410	47	360 - 450
360	42	420	38	380 - 450	45	410	45	370 - 460
370	77	420	37	390 - 460	39	420	43	370 - 460
380	116	430	35	400 - 470	92	420	41	380 - 460
390	137	440	34	410 - 470	163	430	39	390 - 470
400	162	450	33	420 - 480	153	440	37	400 - 470
410	206	460	31	430 - 490	263	450	35	410 - 480
420	266	470	30	440 - 500	359	450	33	420 - 490
430	278	470	29	450 - 500	326	460	31	430 - 490
440	329	480	28	460 - 510	431	470	29	440 - 500
450	388	490	26	470 - 520	540	480	28	460 - 510
460	510	500	25	480 - 530	593	490	26	470 - 520
470	592	510	24	490 - 540	820	500	25	480 - 530
480	677	520	23	500 - 540	940	510	24	490 - 540
490	835	530	23	510 - 550	1,099	520	24	500 - 550
500	962	540	22	520 - 560	1,161	530	24	510 - 560
510	1,177	550	22	530 - 570	1,131	540	24	520 - 570
520	1,205	560	21	540 - 580	1,168	560	24	530 - 580
530	1,227	570	21	550 - 590	1,094	570	25	540 - 590
540	1,234	580	21	560 - 600	881	580	25	550 - 600
550	964	590	22	570 - 610	774	590	26	560 - 610
560	834	600	22	580 - 620	689	600	26	570 - 620
570	717	610	23	580 - 630	579	610	27	580 - 630
580	565	620	23	590 - 640	516	620	27	590 - 640
590	480	630	24	600 - 650	373	630	28	600 - 650
600	395	630	25	610 - 660	368	640	28	610 - 660
610	320	640	26	620 - 670	279	650	29	620 - 670
620	285	650	27	630 - 680	234	650	29	630 - 680
630	227	660	27	630 - 690	213	660	29	630 - 690
640	232	670	28	640 - 700	179	670	29	640 - 700
650	159	680	28	650 - 710	150	680	29	650 - 710
660	174	690	28	660 - 720	163	690	29	660 - 720
670	129	700	28	670 - 720	105	700	29	670 - 720
680	132	700	28	680 - 730	111	700	29	670 - 730
690	114	710	27	680 - 740	102	710	29	680 - 740
700	83	720	27	690 - 750	80	720	29	690 - 750
710	91	730	26	700 - 750	95	730	29	700 - 760
720	83	730	26	710 - 760	78	740	29	710 - 760
730	97	740	26	720 - 770	73	740	28	720 - 770
740	62	750	26	720 - 770	77	750	28	730 - 780
750	38	760	26	730 - 780	47	760	27	740 - 790
760	7	760	27	740 - 790	19	780	27	750 - 800

*Note.* The results at the lowest scores below the first underline were manually adjusted conditional means, standard deviations, and ranges.



**Table 6: PSAT 8/9 9th Spring -to- PSAT 10 10th Spring Expected Score Range**

PSAT 8/9 9th	ERW Section				Math Section			
	N	PSAT 10 10th Mean	PSAT 10 10th SD	PSAT 10 10th Lower-Upper Bound	N	PSAT 10 10th Mean	PSAT 10 10th SD	PSAT 10 10th Lower-Upper Bound
120	-	160	35	160 - 200	-	180	40	160 - 220
130	-	170	35	160 - 210	-	190	40	160 - 230
140	-	180	35	160 - 220	-	200	40	160 - 240
150	-	190	35	160 - 230	-	210	40	170 - 250
160	-	200	35	170 - 240	-	220	40	180 - 260
170	-	210	35	180 - 250	-	230	40	190 - 270
180	-	220	35	190 - 260	-	240	40	200 - 280
190	-	230	35	200 - 270	-	250	40	210 - 290
200	-	240	35	210 - 280	1	260	40	220 - 300
210	-	250	35	220 - 290	-	270	40	230 - 310
220	-	260	35	230 - 300	-	280	40	240 - 320
230	-	270	35	240 - 310	-	290	40	250 - 330
240	-	280	35	250 - 320	2	300	40	260 - 340
250	-	290	35	260 - 330	-	310	40	270 - 350
260	-	300	35	270 - 340	-	320	40	280 - 360
270	-	310	35	280 - 350	2	330	40	290 - 370
280	-	320	35	290 - 360	1	340	40	300 - 380
290	1	330	35	300 - 370	3	350	40	310 - 390
300	2	340	35	310 - 380	-	360	40	320 - 400
310	2	350	35	320 - 390	14	370	40	330 - 410
320	7	360	35	330 - 400	9	370	35	340 - 410
330	10	360	27	330 - 390	13	370	31	340 - 400
340	18	360	22	340 - 380	21	380	27	350 - 400
350	29	370	21	340 - 390	39	380	23	360 - 410
360	33	370	22	350 - 400	46	390	21	370 - 410
370	34	380	23	360 - 410	40	400	20	380 - 420
380	30	390	24	370 - 420	49	400	20	380 - 420
390	43	400	24	380 - 430	57	410	20	390 - 430
400	49	420	24	390 - 440	68	420	20	400 - 440
410	48	430	23	410 - 450	65	430	19	410 - 450
420	70	440	21	420 - 460	91	440	18	430 - 460
430	105	450	19	430 - 470	134	450	18	440 - 470
440	109	460	17	450 - 480	104	470	17	450 - 480
450	122	470	16	460 - 490	108	480	17	460 - 490
460	105	480	15	470 - 500	59	490	18	470 - 500
470	69	500	16	480 - 510	44	500	18	480 - 510
480	53	510	17	490 - 520	34	510	19	490 - 520
490	47	520	19	500 - 540	27	520	20	500 - 540
500	36	530	21	510 - 550	25	530	20	510 - 550
510	22	540	22	520 - 560	18	540	21	520 - 560
520	16	550	23	530 - 580	9	550	22	530 - 580
530	16	560	24	540 - 590	10	570	24	540 - 590
540	5	580	25	550 - 600	5	580	25	560 - 610
550	11	590	26	560 - 610	1	590	25	570 - 620
560	2	600	28	570 - 630	4	600	25	580 - 630
570	6	610	29	580 - 640	2	610	25	590 - 640
580	1	620	29	590 - 650	3	620	25	600 - 650
590	3	630	29	600 - 660	1	630	25	610 - 660
600	1	640	29	610 - 670	-	640	25	620 - 670
610	1	650	29	620 - 680	1	650	25	630 - 680
620	1	660	29	630 - 690	-	660	25	640 - 690
630	-	670	29	640 - 700	-	670	25	650 - 700
640	2	680	29	650 - 710	-	680	25	660 - 710
650	-	690	29	660 - 720	-	690	25	670 - 720
660	-	700	29	670 - 730	-	700	25	680 - 730
670	1	710	29	680 - 740	-	710	25	690 - 740
680	-	720	29	690 - 750	-	720	25	700 - 750
690	-	730	29	700 - 760	-	730	25	710 - 760
700	-	740	29	710 - 760	-	740	25	720 - 760
710	-	750	29	720 - 760	-	750	25	730 - 760
720	-	760	29	730 - 760	-	760	25	740 - 760

Note. The results at the lowest scores below the first underline were manually adjusted conditional means, standard deviations, and ranges. Results for the highest scores above the second underline were also manually adjusted.

**Table 7: PSAT 10 10th Spring -to- SAT 11th Spring Expected Score Range**

PSAT 10 10th	ERW Section				Math Section			
	N	SAT 11th Mean	SAT 11th SD	SAT 11th Lower-Upper Bound	N	SAT 11th Mean	SAT 11th SD	SAT 11th Lower-Upper Bound
160	-	220	35	200 - 250	-	240	42	200 - 280
170	-	230	35	200 - 260	-	250	42	200 - 290
180	-	240	35	200 - 270	-	260	42	210 - 300
190	-	250	35	210 - 280	-	270	42	220 - 310
200	-	260	35	220 - 290	-	280	42	230 - 320
210	-	270	35	230 - 300	-	290	42	240 - 330
220	-	280	35	240 - 310	-	300	42	250 - 340
230	-	290	35	250 - 320	-	310	42	260 - 350
240	-	300	35	260 - 330	-	320	42	270 - 360
250	-	310	35	270 - 340	-	330	42	280 - 370
260	-	320	35	280 - 350	-	340	42	290 - 380
270	-	330	35	290 - 360	-	350	42	300 - 390
280	-	340	35	300 - 370	-	360	42	310 - 400
290	-	350	35	310 - 380	-	370	42	320 - 410
300	1	360	35	320 - 390	1	380	42	330 - 420
310	3	370	35	330 - 400	2	390	42	340 - 430
320	1	380	35	340 - 410	6	400	42	350 - 440
330	7	390	35	350 - 420	3	380	34	350 - 420
340	18	390	32	360 - 420	15	380	29	350 - 410
350	20	390	30	360 - 420	14	380	28	350 - 400
360	30	400	29	370 - 430	18	380	27	350 - 400
370	64	400	27	380 - 430	45	380	28	350 - 410
380	64	410	27	390 - 440	65	390	30	360 - 420
390	71	420	26	400 - 450	78	400	31	370 - 430
400	71	430	25	410 - 460	106	410	32	380 - 440
410	85	440	25	420 - 470	100	430	32	390 - 460
420	64	450	24	430 - 480	93	440	31	410 - 470
430	94	470	23	440 - 490	149	460	30	430 - 480
440	109	480	23	450 - 500	140	470	28	440 - 500
450	122	490	22	470 - 510	180	480	26	460 - 510
460	171	500	21	480 - 520	165	500	24	470 - 520
470	153	510	21	490 - 530	170	510	23	490 - 530
480	154	520	20	500 - 540	143	520	22	500 - 540
490	137	530	20	510 - 550	129	530	22	510 - 550
500	110	540	20	520 - 560	108	540	22	520 - 570
510	119	550	20	530 - 570	91	560	23	530 - 580
520	104	560	20	540 - 580	80	570	24	540 - 590
530	90	570	20	550 - 590	57	580	26	560 - 610
540	79	580	21	560 - 610	63	590	29	570 - 620
550	52	590	22	570 - 620	29	610	31	580 - 640
560	53	610	23	580 - 630	56	620	33	590 - 650
570	56	620	24	590 - 640	31	630	36	600 - 670
580	33	630	24	600 - 650	27	640	37	610 - 680
590	20	630	25	610 - 660	32	650	38	620 - 690
600	30	640	26	620 - 670	9	660	39	630 - 700
610	15	650	27	630 - 680	19	670	39	630 - 710
620	11	660	27	630 - 690	8	680	39	640 - 720
630	14	670	27	640 - 700	5	690	39	650 - 730
640	8	680	28	650 - 710	7	700	39	660 - 740
650	4	690	28	660 - 710	5	710	38	670 - 750
660	13	690	28	670 - 720	5	710	37	680 - 750
670	1	700	28	670 - 730	4	720	37	690 - 760
680	6	710	27	680 - 740	1	730	37	700 - 770
690	4	720	27	690 - 750	-	740	37	710 - 780
700	3	730	27	700 - 760	2	750	37	720 - 790
710	-	740	27	710 - 770	2	760	37	730 - 800
720	2	750	27	720 - 780	-	770	37	740 - 800
730	1	760	27	730 - 790	1	780	37	750 - 800
740	1	770	27	740 - 800	2	790	37	760 - 800
750	-	780	27	750 - 800	2	800	37	770 - 800
760	-	790	27	760 - 800	-	800	37	780 - 800

Note. The results at the lowest scores below the first underline were manually adjusted conditional means, standard deviations, and ranges. Results for the highest scores above the second underline were also manually adjusted.

**Table 8: PSAT/NMSQT 11th Fall -to- SAT 11th Spring Expected Score Range**

PSAT/NMSQT 11th	ERW Section				Math Section			
	N	SAT 11th Mean	SAT 11th SD	SAT 11th Lower-Upper Bound	N	SAT 11th Mean	SAT 11th SD	SAT 11th Lower-Upper Bound
160	-	220	55	200 - 280	-	220	47	200 - 270
170	-	230	55	200 - 290	-	230	47	200 - 280
180	-	240	55	200 - 300	-	240	47	200 - 290
190	-	250	55	200 - 310	-	250	47	200 - 300
200	-	260	55	210 - 320	-	260	47	210 - 310
210	-	270	55	220 - 330	-	270	47	220 - 320
220	1	280	55	230 - 340	-	280	47	230 - 330
230	-	290	55	240 - 350	-	290	47	240 - 340
240	-	300	55	250 - 360	-	300	47	250 - 350
250	-	310	55	260 - 370	2	310	47	260 - 360
260	-	320	55	270 - 380	-	320	47	270 - 370
270	1	330	55	280 - 390	1	330	47	280 - 380
280	1	340	55	290 - 400	1	340	47	290 - 390
290	2	350	55	300 - 410	4	350	47	300 - 400
300	-	360	55	310 - 420	-	360	47	310 - 410
310	4	370	55	320 - 430	6	370	47	320 - 420
320	5	380	55	330 - 440	-	370	46	320 - 410
330	8	380	49	340 - 430	2	370	45	330 - 420
340	15	390	45	340 - 430	11	370	44	330 - 420
350	19	390	40	350 - 430	20	380	42	340 - 420
360	32	400	37	360 - 440	29	380	40	340 - 420
370	50	400	34	370 - 440	36	390	37	350 - 430
380	89	410	31	380 - 440	85	400	35	360 - 430
390	94	420	29	390 - 450	126	410	33	380 - 440
400	143	430	27	400 - 460	148	420	30	390 - 450
410	155	440	25	410 - 460	190	430	28	400 - 460
420	183	450	24	420 - 470	237	440	27	410 - 470
430	205	460	23	430 - 480	278	450	25	420 - 470
440	246	470	22	440 - 490	352	460	24	440 - 480
450	318	470	21	450 - 500	426	470	23	450 - 490
460	354	480	20	460 - 500	483	480	22	460 - 500
470	424	490	20	470 - 510	529	490	21	470 - 510
480	474	500	19	480 - 520	675	500	21	480 - 520
490	531	510	19	490 - 530	741	510	21	490 - 530
500	637	520	19	500 - 540	909	520	21	500 - 550
510	723	530	19	510 - 550	1,024	540	21	510 - 560
520	911	540	18	520 - 560	1,107	550	21	520 - 570
530	1,036	550	18	530 - 570	1,165	560	21	540 - 580
540	1,162	560	18	540 - 580	1,213	570	21	550 - 590
550	1,188	570	18	550 - 590	1,063	580	21	560 - 600
560	1,168	580	18	560 - 600	988	590	21	570 - 610
570	1,090	590	18	570 - 610	854	600	22	580 - 620
580	925	600	18	580 - 620	678	610	22	590 - 630
590	814	610	19	590 - 630	560	620	23	600 - 640
600	676	620	19	600 - 640	538	630	24	610 - 650
610	586	630	20	610 - 650	436	640	25	620 - 670
620	502	640	21	620 - 660	331	650	26	620 - 680
630	412	650	21	630 - 670	299	660	27	630 - 690
640	350	660	22	640 - 680	227	670	28	640 - 700
650	309	670	23	640 - 690	260	680	29	650 - 710
660	217	680	25	650 - 700	217	690	30	660 - 720
670	197	680	26	660 - 710	129	700	30	670 - 730
680	162	690	27	660 - 720	145	710	31	680 - 740
690	129	700	28	670 - 730	113	720	31	680 - 750
700	135	710	29	680 - 740	48	720	31	690 - 750
710	103	720	29	690 - 750	81	730	31	700 - 760
720	69	730	29	700 - 760	37	740	30	710 - 770
730	67	740	29	710 - 760	74	750	30	720 - 780
740	45	750	28	720 - 770	53	760	30	730 - 790
750	33	760	26	730 - 780	61	770	29	740 - 800
760	8	770	23	740 - 790	16	780	29	750 - 800

*Note.* The results at the lowest scores below the first underline were manually adjusted conditional means, standard deviations, and ranges.

**Table 9: SAT 11th Spring -to- SAT 12th Fall Expected Score Range**

SAT 11th	ERW Section				Math Section			
	N	SAT 12th Mean	SAT 12th SD	SAT 12th Lower-Upper Bound	N	SAT 12th Mean	SAT 12th SD	SAT 12th Lower-Upper Bound
200	-	270	69	200 - 340	-	250	63	200 - 320
210	-	280	69	210 - 350	-	260	63	200 - 330
220	-	290	69	220 - 360	-	270	63	210 - 340
230	-	300	69	230 - 370	1	280	63	220 - 350
240	-	310	69	240 - 380	-	290	63	230 - 360
250	-	320	69	250 - 390	-	300	63	240 - 370
260	-	330	69	260 - 400	-	310	63	250 - 380
270	1	340	69	270 - 410	-	320	63	260 - 390
280	-	350	69	280 - 420	1	330	63	270 - 400
290	-	360	69	290 - 430	-	340	63	280 - 410
300	2	370	69	300 - 440	-	350	63	290 - 420
310	1	380	69	310 - 450	1	360	63	300 - 430
320	2	390	69	320 - 460	4	370	63	310 - 440
330	5	400	69	330 - 470	11	380	63	320 - 450
340	8	400	59	340 - 460	13	390	56	330 - 440
350	11	400	51	350 - 450	15	390	51	340 - 440
360	10	400	45	360 - 450	25	390	47	350 - 440
370	25	410	41	370 - 450	21	400	43	360 - 440
380	40	410	38	380 - 450	54	410	41	370 - 450
390	57	420	36	380 - 460	79	410	38	380 - 450
400	93	430	34	390 - 460	127	420	36	390 - 460
410	110	440	33	400 - 470	115	430	35	400 - 460
420	142	440	32	410 - 480	192	440	33	410 - 470
430	205	450	32	420 - 490	251	450	32	420 - 480
440	241	460	31	430 - 490	312	460	30	430 - 490
450	274	470	30	440 - 500	332	470	29	440 - 490
460	314	480	29	450 - 510	428	470	27	450 - 500
470	417	490	27	460 - 520	481	480	26	460 - 510
480	467	500	26	470 - 520	534	490	25	470 - 520
490	563	510	24	480 - 530	670	500	23	480 - 530
500	679	520	23	490 - 540	809	510	22	490 - 540
510	814	530	22	500 - 550	924	520	21	500 - 540
520	885	540	21	510 - 560	1,036	530	21	510 - 550
530	1,029	540	20	520 - 560	1,126	540	20	520 - 560
540	1,244	550	20	530 - 570	1,161	550	20	530 - 570
550	1,317	560	19	540 - 580	1,160	560	20	540 - 580
560	1,280	570	19	550 - 590	993	570	21	550 - 590
570	1,162	580	20	560 - 600	900	580	21	560 - 600
580	993	590	20	570 - 610	743	590	22	570 - 610
590	770	600	21	580 - 620	630	600	23	580 - 620
600	648	610	22	590 - 640	545	610	24	590 - 640
610	521	620	23	600 - 650	434	620	25	600 - 650
620	461	630	25	610 - 660	402	630	26	610 - 660
630	386	640	26	620 - 670	291	640	27	610 - 670
640	325	650	27	620 - 680	263	650	29	620 - 680
650	251	660	29	630 - 690	234	660	30	630 - 690
660	218	670	30	640 - 700	212	670	30	640 - 700
670	159	680	30	650 - 710	206	680	31	650 - 710
680	159	690	30	660 - 720	157	690	30	660 - 720
690	106	700	30	670 - 730	149	700	30	670 - 730
700	106	700	30	670 - 730	136	710	29	680 - 740
710	84	710	30	680 - 740	115	720	28	690 - 750
720	56	720	29	690 - 750	93	730	27	700 - 760
730	59	730	28	700 - 750	83	740	26	710 - 760
740	31	730	27	710 - 760	67	750	26	720 - 770
750	23	740	26	710 - 770	74	750	25	730 - 780
760	19	750	26	720 - 770	73	760	25	730 - 780
770	10	750	25	730 - 780	36	760	25	740 - 790
780	7	760	25	730 - 780	34	770	25	740 - 790
790	1	770	25	740 - 790	26	770	27	750 - 800
800	1	780	25	750 - 800	13	780	29	750 - 800

*Note.* The results at the lowest scores below the first underline were manually adjusted conditional means, standard deviations, and ranges. Results for the highest scores above the second underline were also manually adjusted.

**Figure 1: ERW Conditional Mean for Group 2 (PSAT 8/9 9th Fall -to- PSAT/NMSQT 10th Fall)**

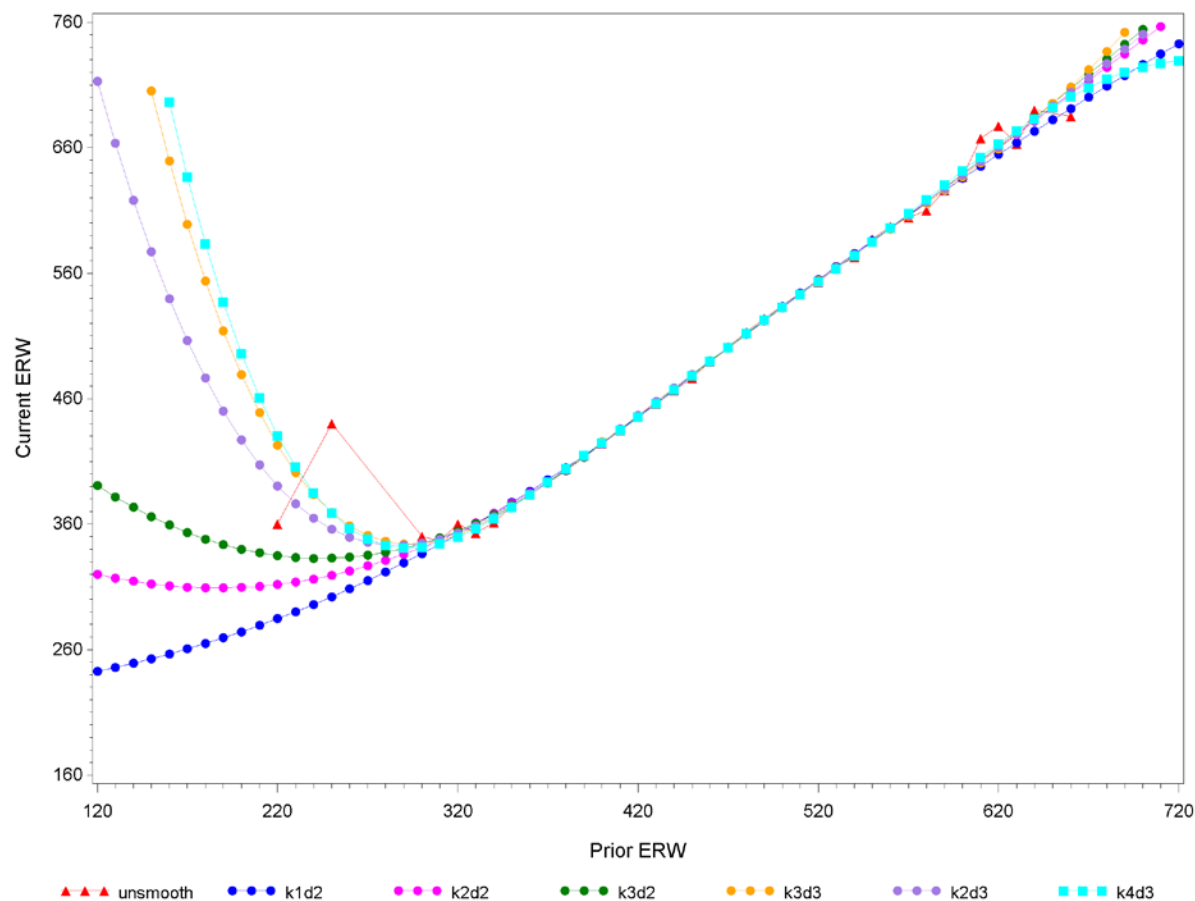
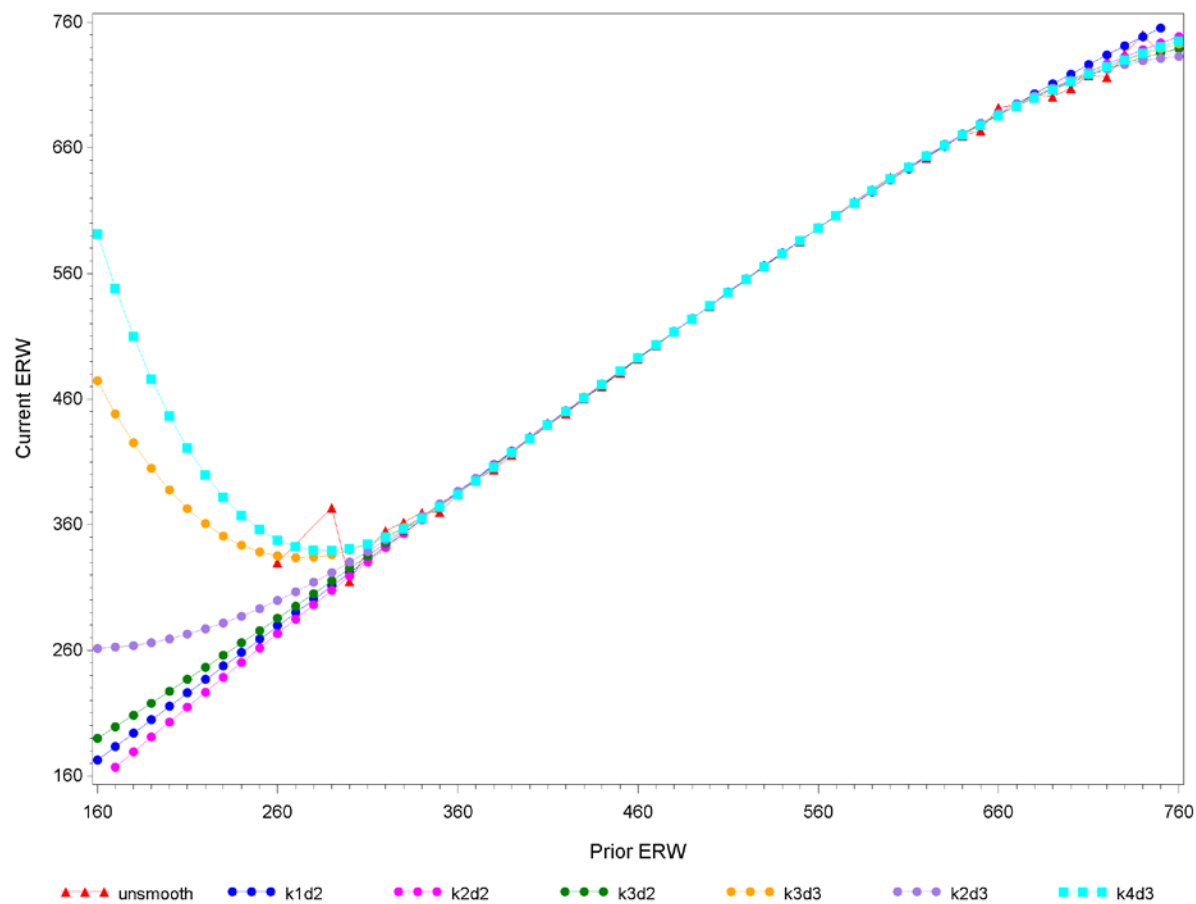
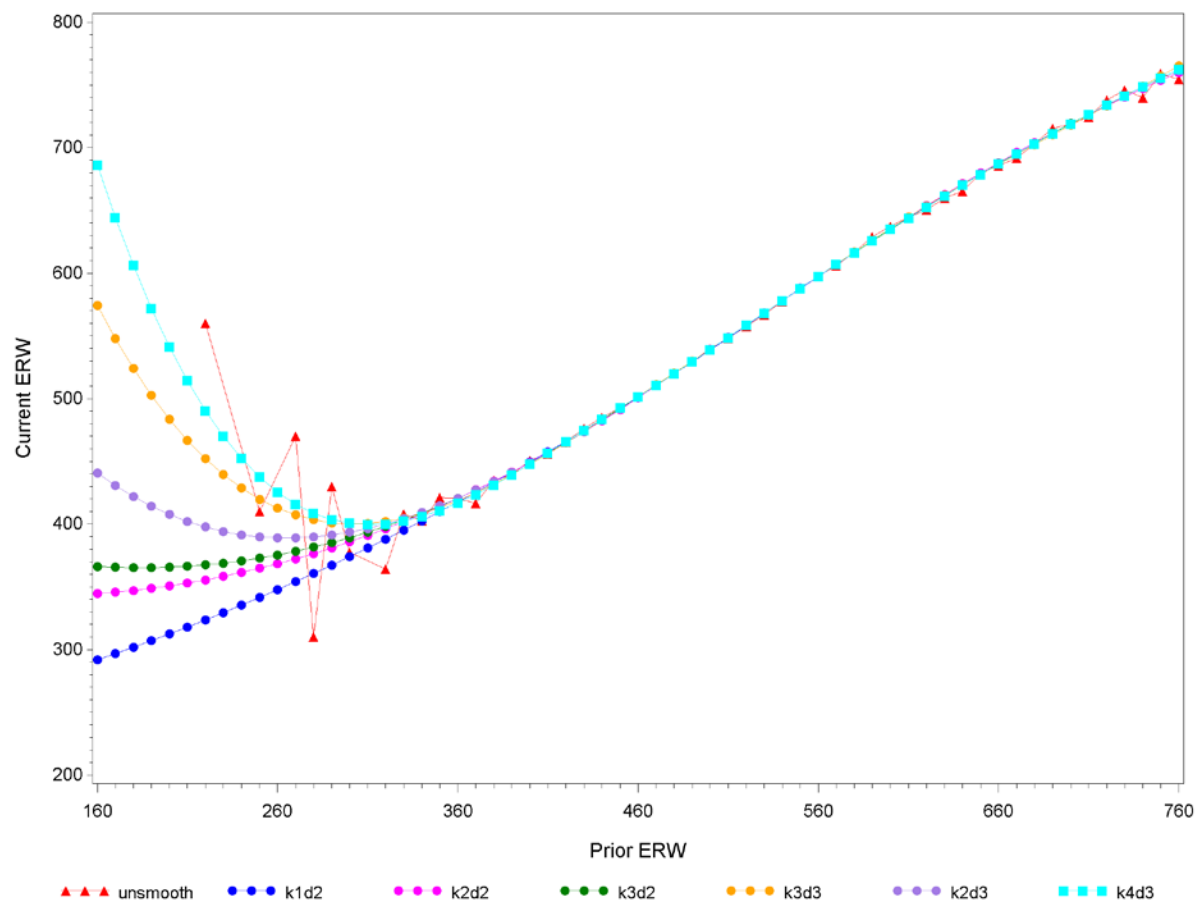


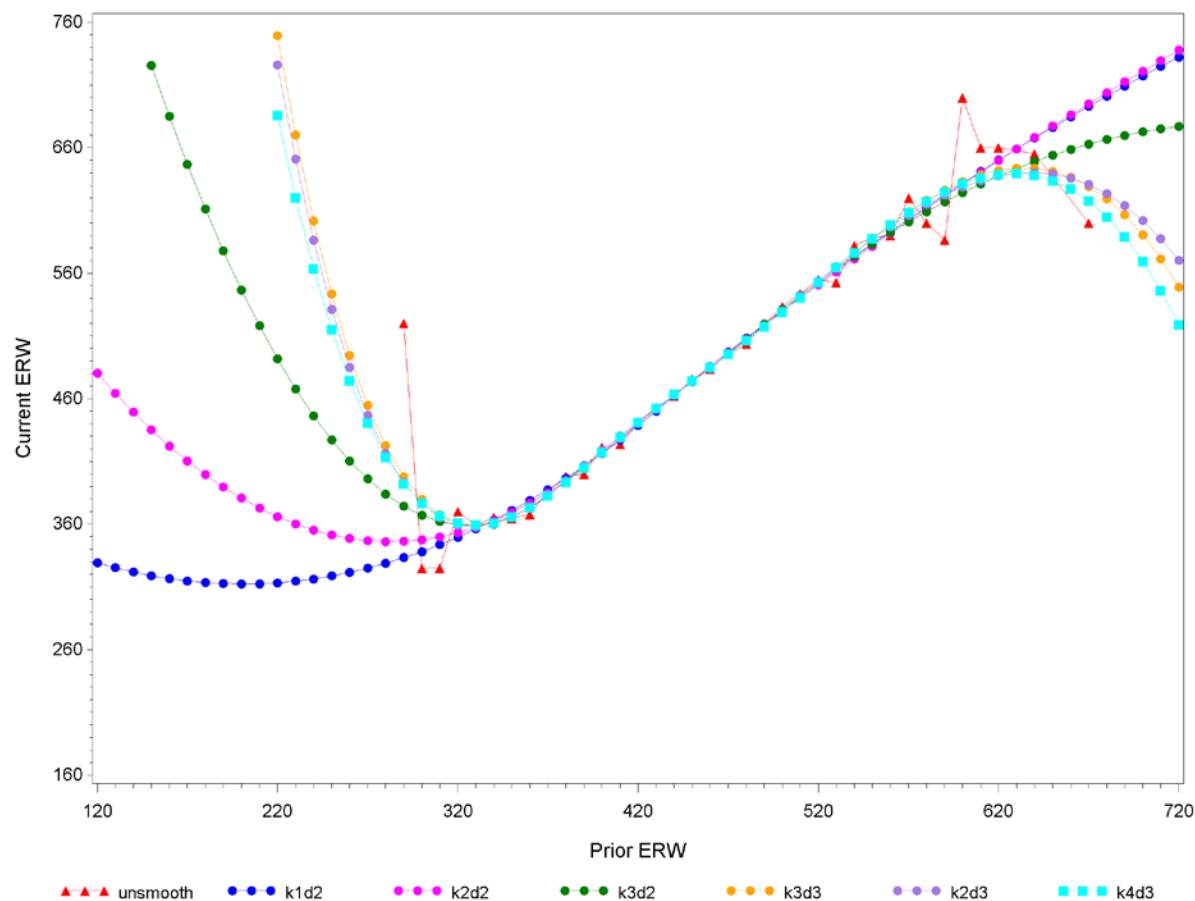
Figure 2: ERW Conditional Mean for Group 3 (PSAT/NMSQT 10th Fall -to- PSAT/NMSQT 11th Fall)



**Figure 3: ERW Conditional Mean for Group 4 (PSAT/NMSQT 11th Fall -to- SAT 12th Fall)**



**Figure 4: ERW Conditional Mean for Group 6 (PSAT 8/9 9th Spring -to- PSAT 10 10th Spring)**





**Figure 5: ERW Conditional Mean for Group 7 (PSAT 10 10th Spring -to- SAT 11th Spring)**

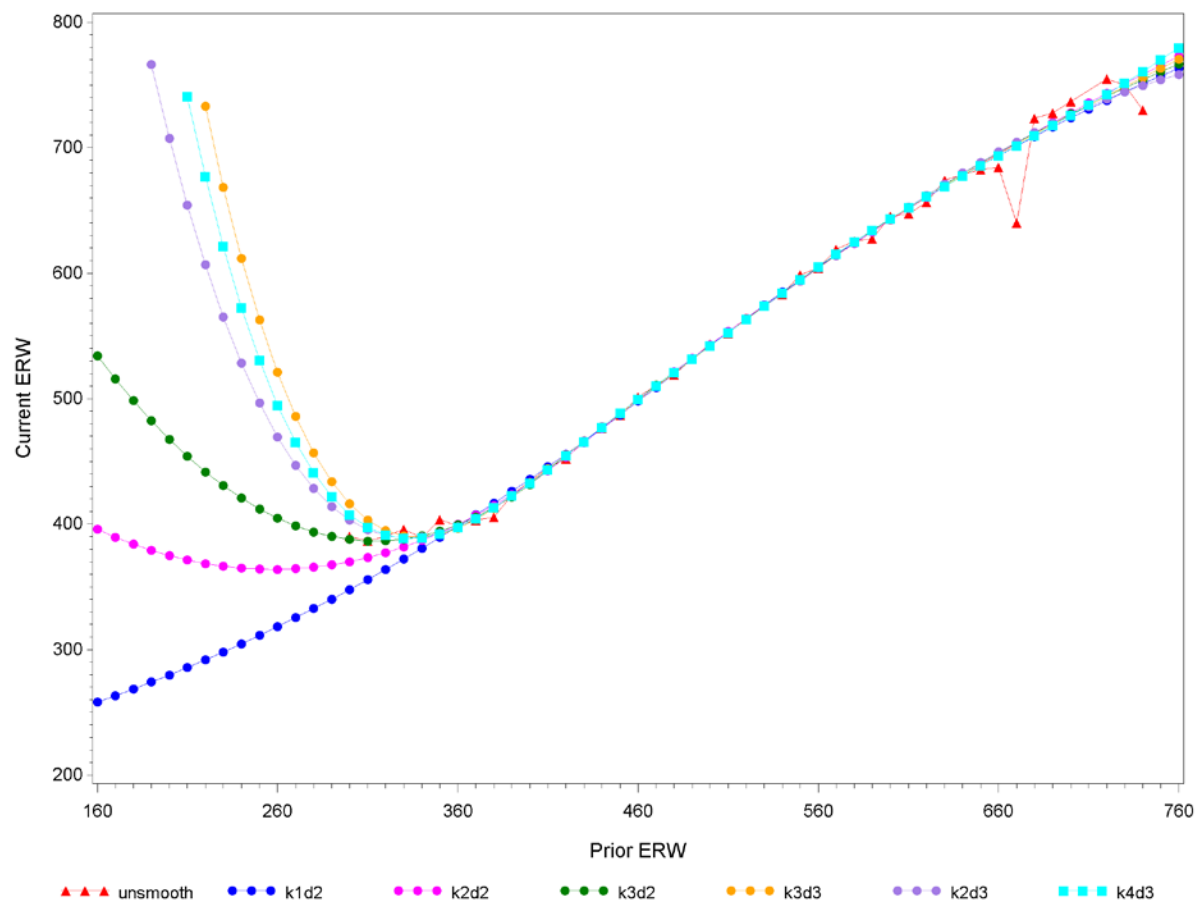


Figure 6: ERW Conditional Mean for Group 8 (PSAT/NMSQT 11th Fall -to- SAT 11th Spring)

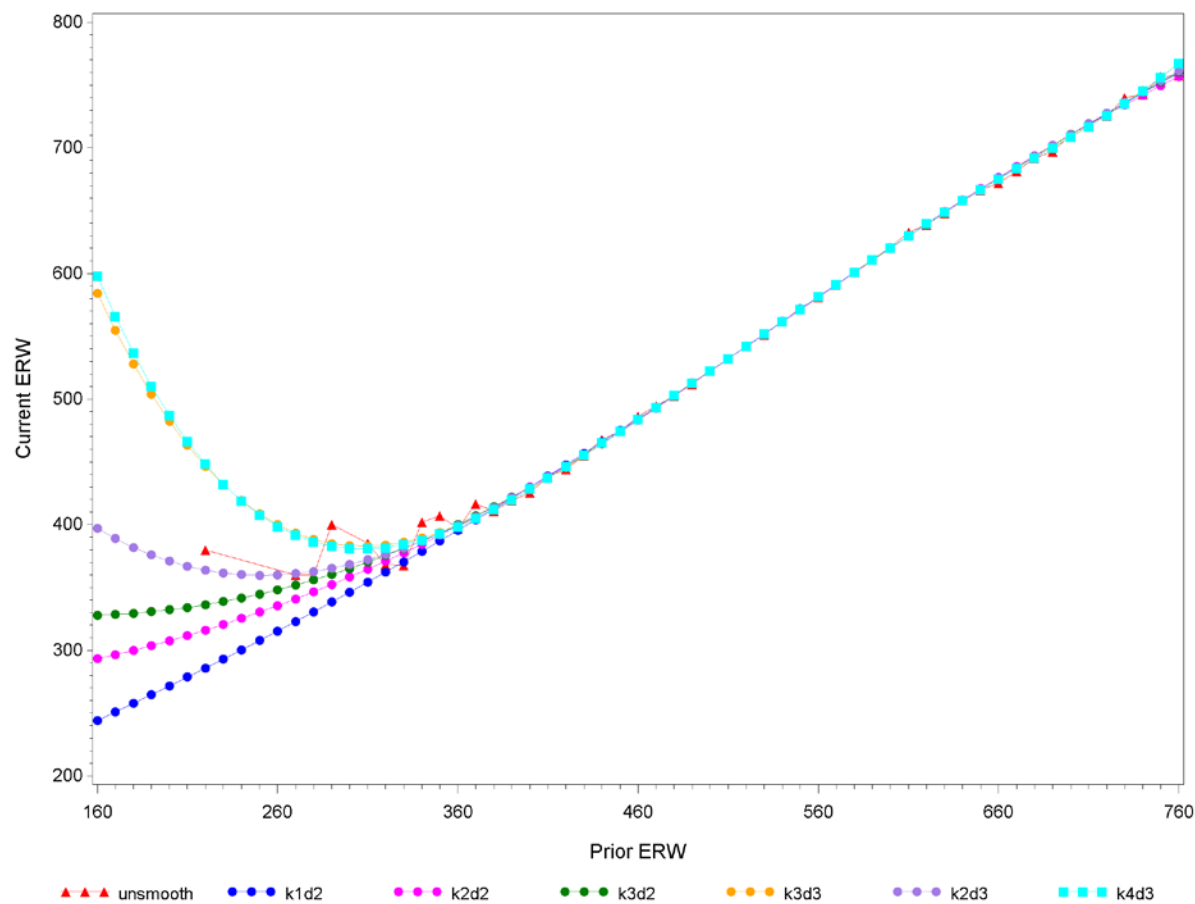
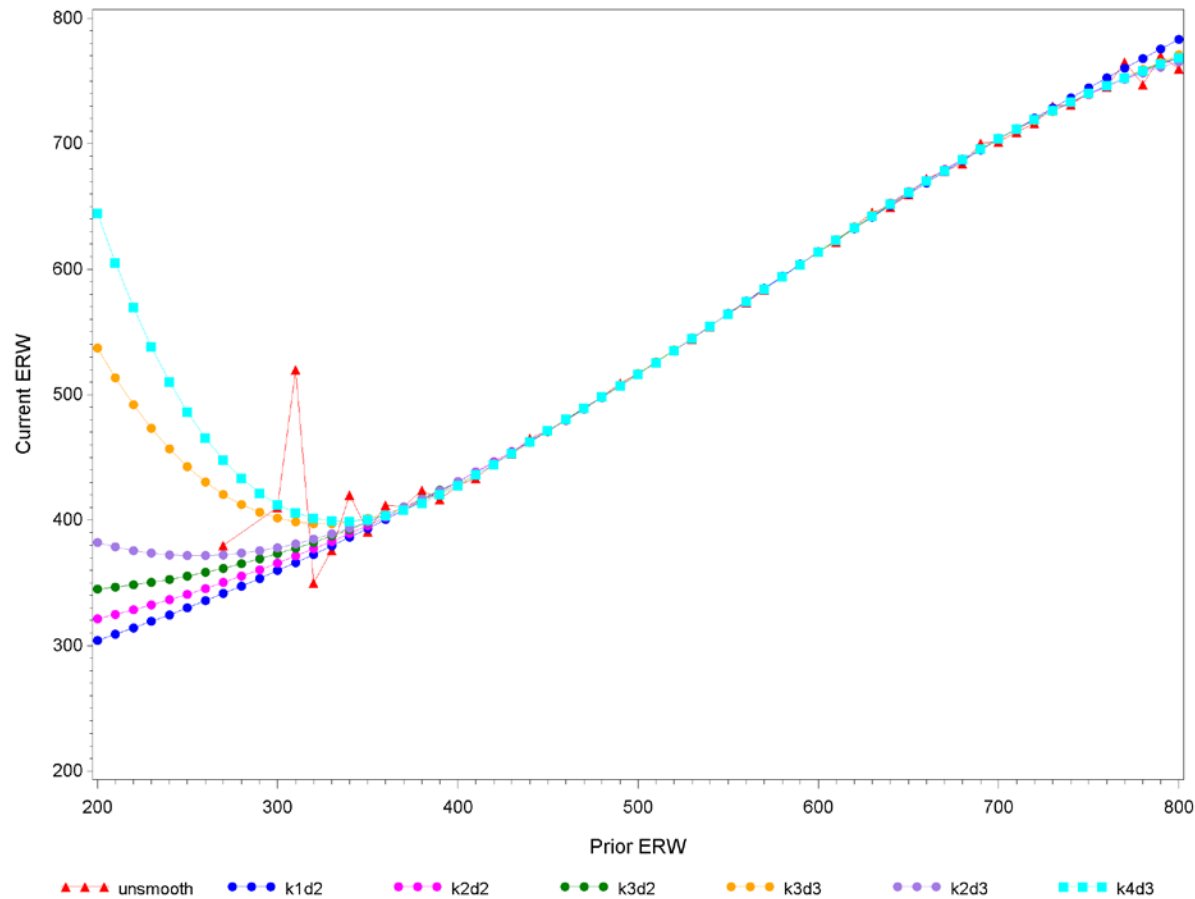
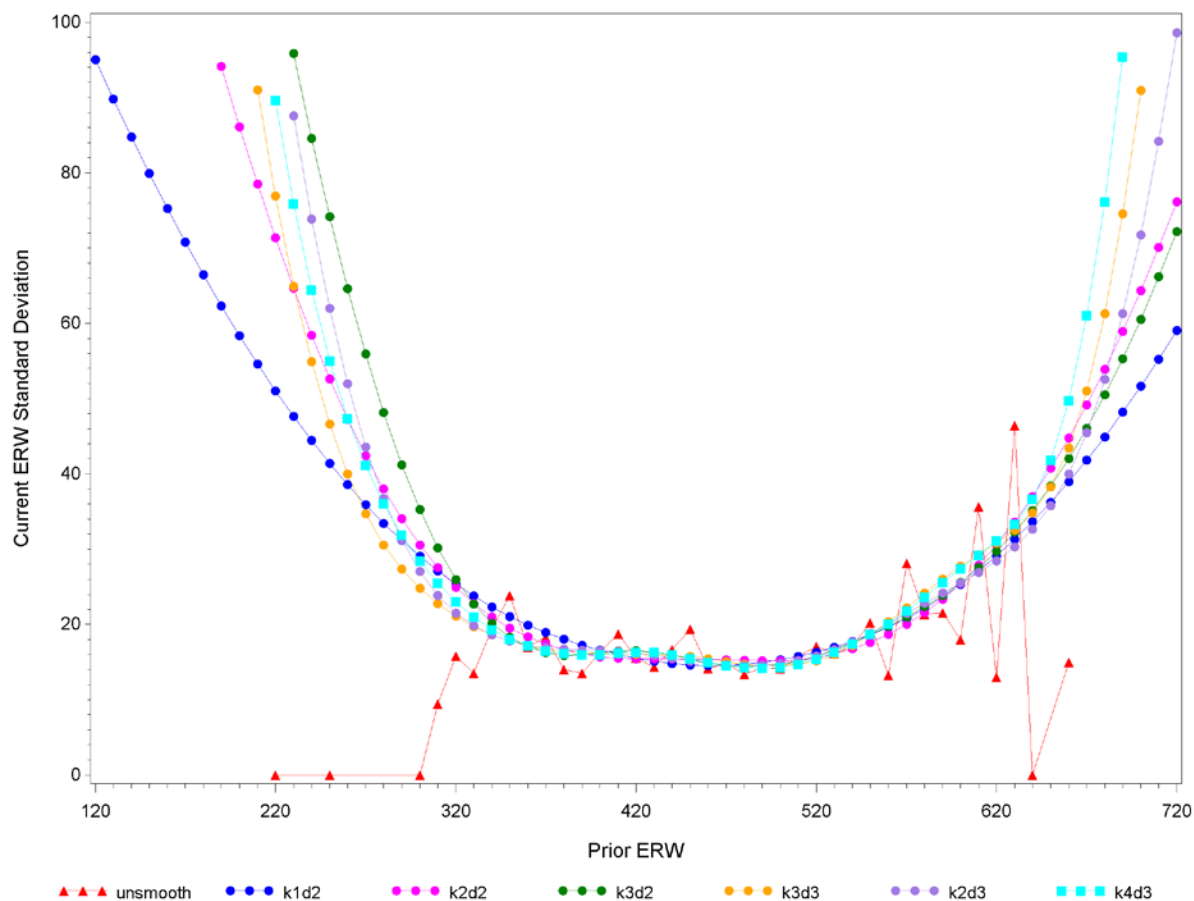


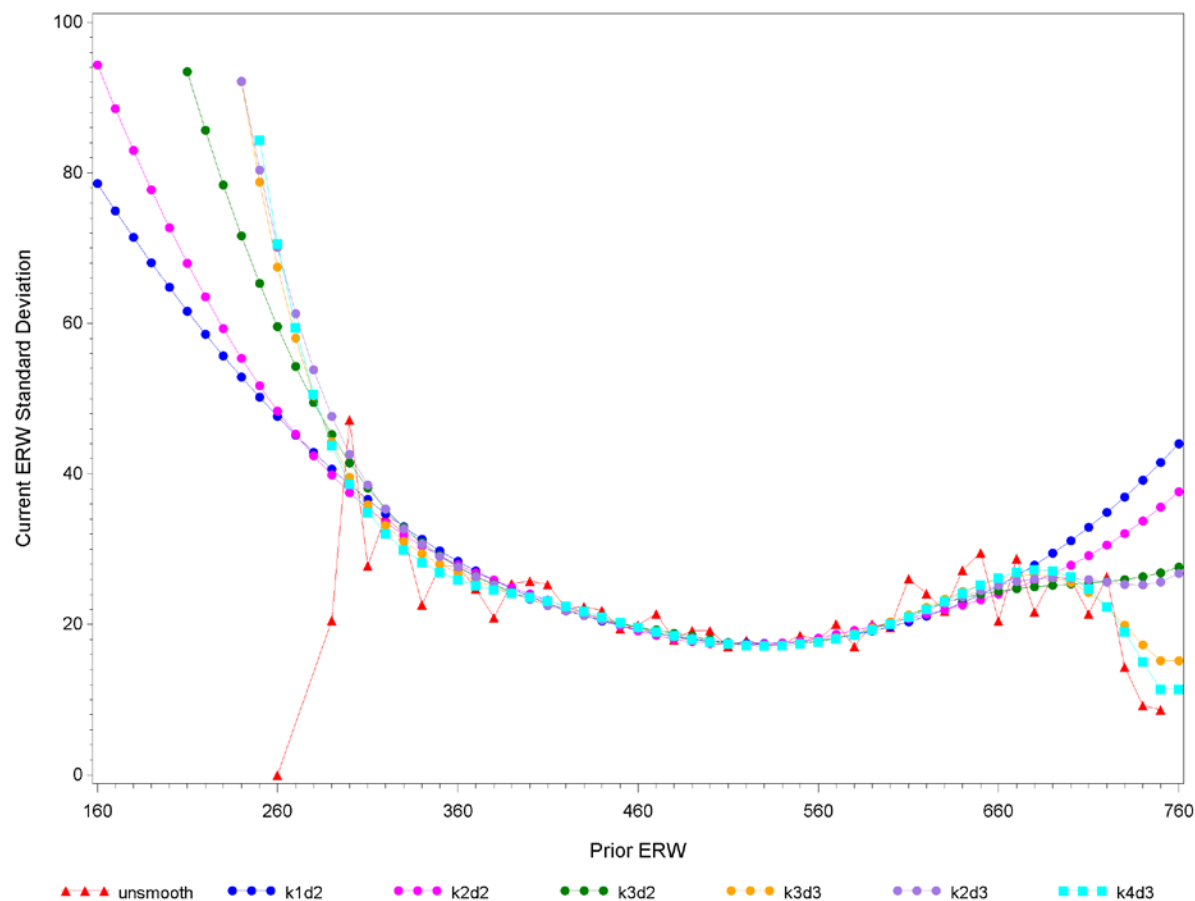
Figure 7: ERW Conditional Mean for Group 9 (SAT 11th Spring -to- SAT 12th Fall)



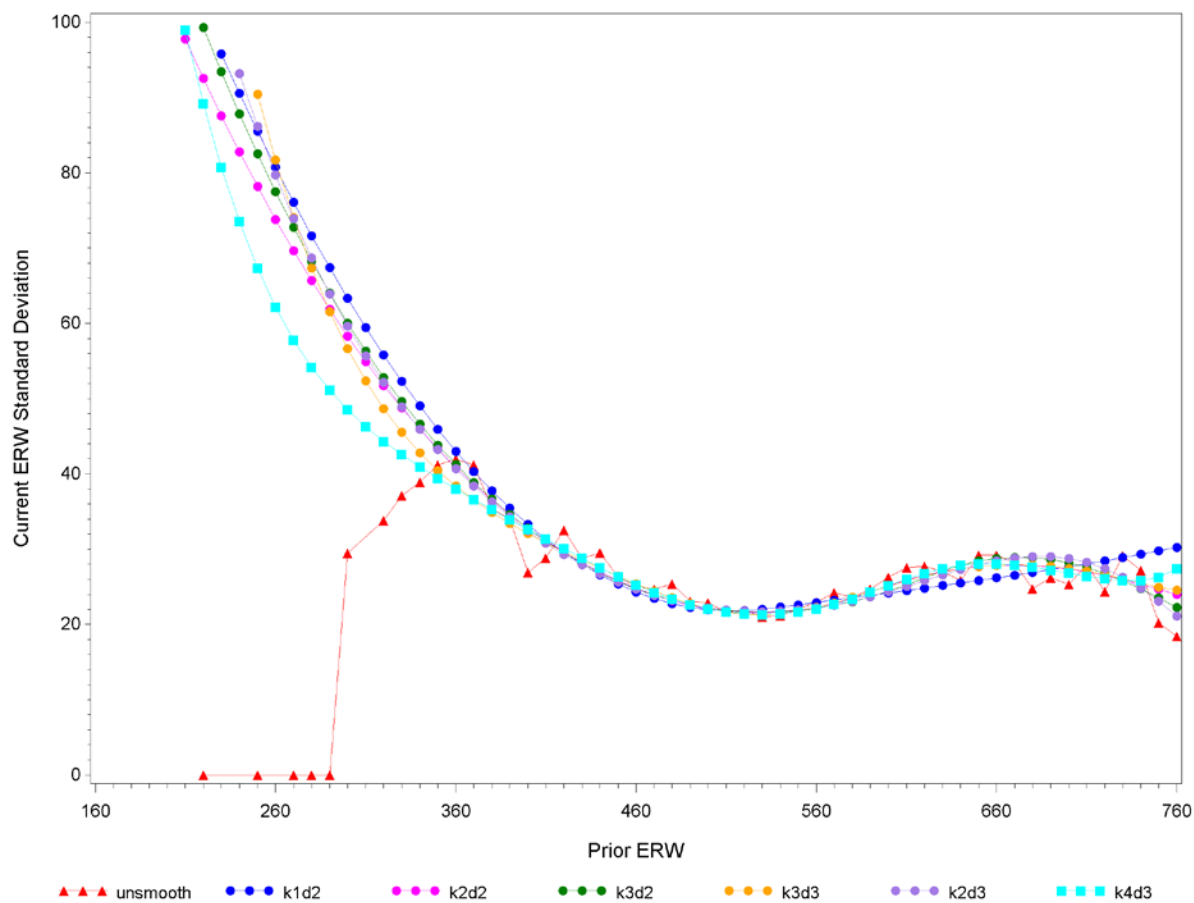
**Figure 8: ERW Conditional Standard Deviation for Group 2 (PSAT 8/9 9th Fall -to- PSAT/NMSQT 10th Fall)**



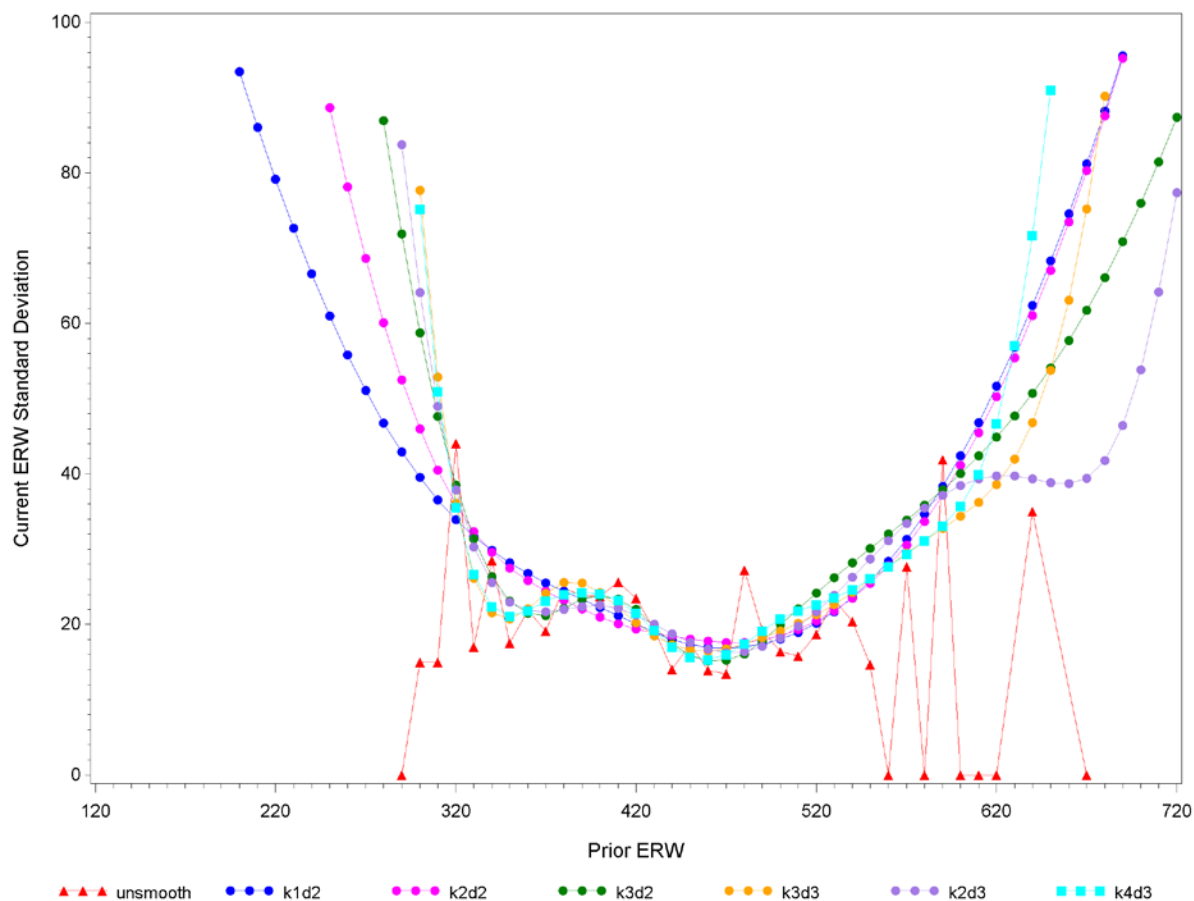
**Figure 9: ERW Conditional Standard Deviation for Group 3 (PSAT/NMSQT 10th Fall -to- PSAT/NMSQT 11th Fall)**



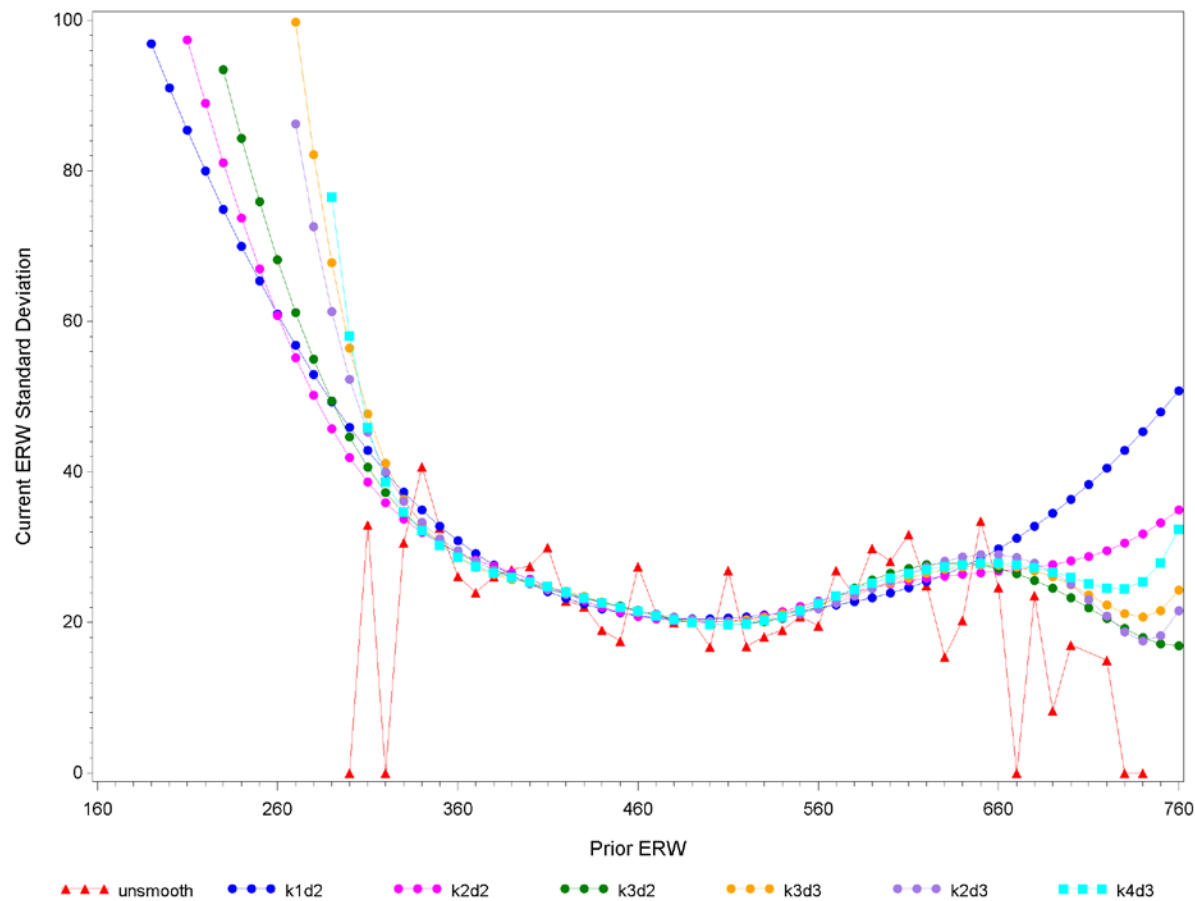
**Figure 10: ERW Conditional Standard Deviation for Group 4 (PSAT/NMSQT 11th Fall -to- SAT 12th Fall)**



**Figure 11: ERW Conditional Standard Deviation for Group 6 (PSAT 8/9 9th Spring - to- PSAT 10 10th Spring)**

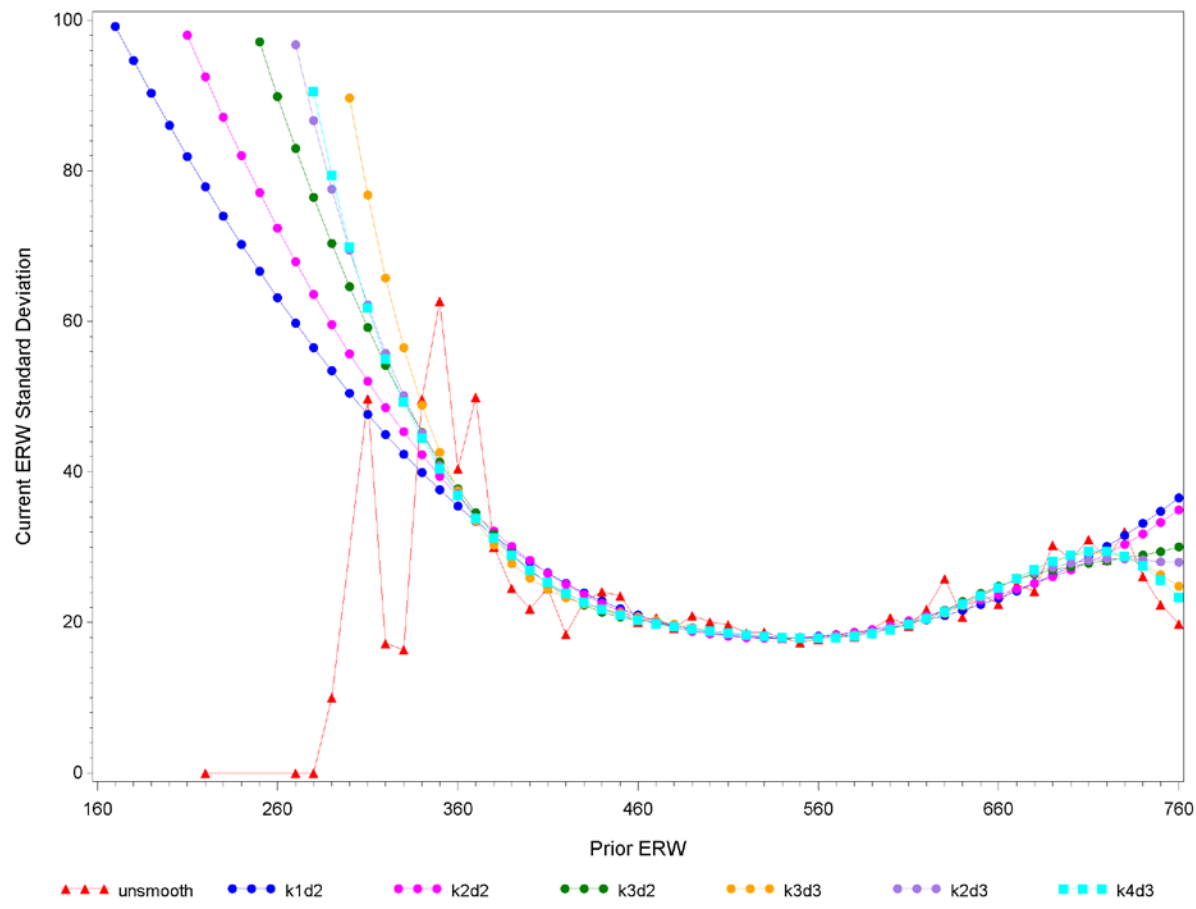


**Figure 12: ERW Conditional Standard Deviation for Group 7 (PSAT 10 10th Spring -to- SAT 11th Spring)**

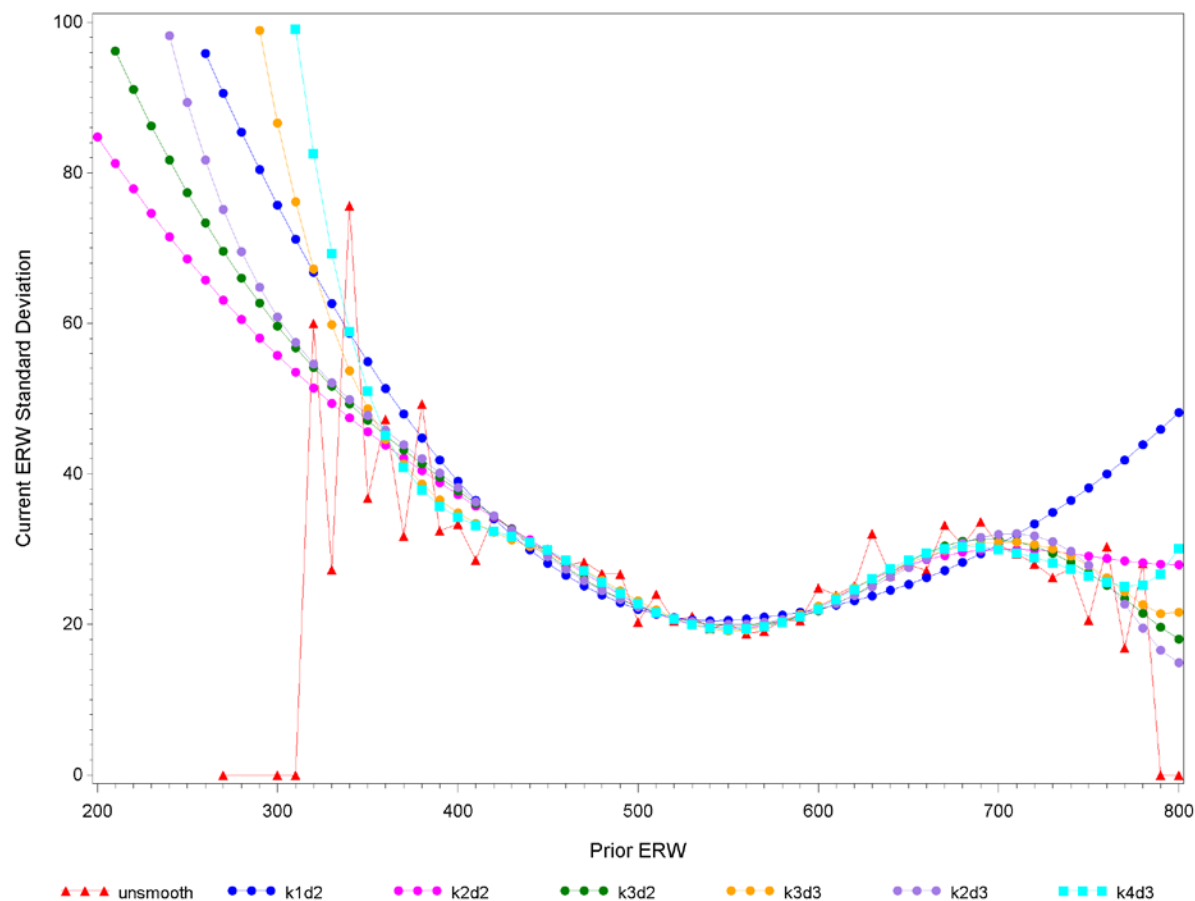




**Figure 13: ERW Conditional Standard Deviation for Group 8 (PSAT/NMSQT 11th Fall -to- SAT 11th Spring)**



**Figure 14: ERW Conditional Standard Deviation for Group 9 (SAT 11th Spring -to- SAT 12th Fall)**



**Figure 15: Math Conditional Mean for Group 2 (PSAT 8/9 9th Fall -to- PSAT/NMSQT 10th Fall)**

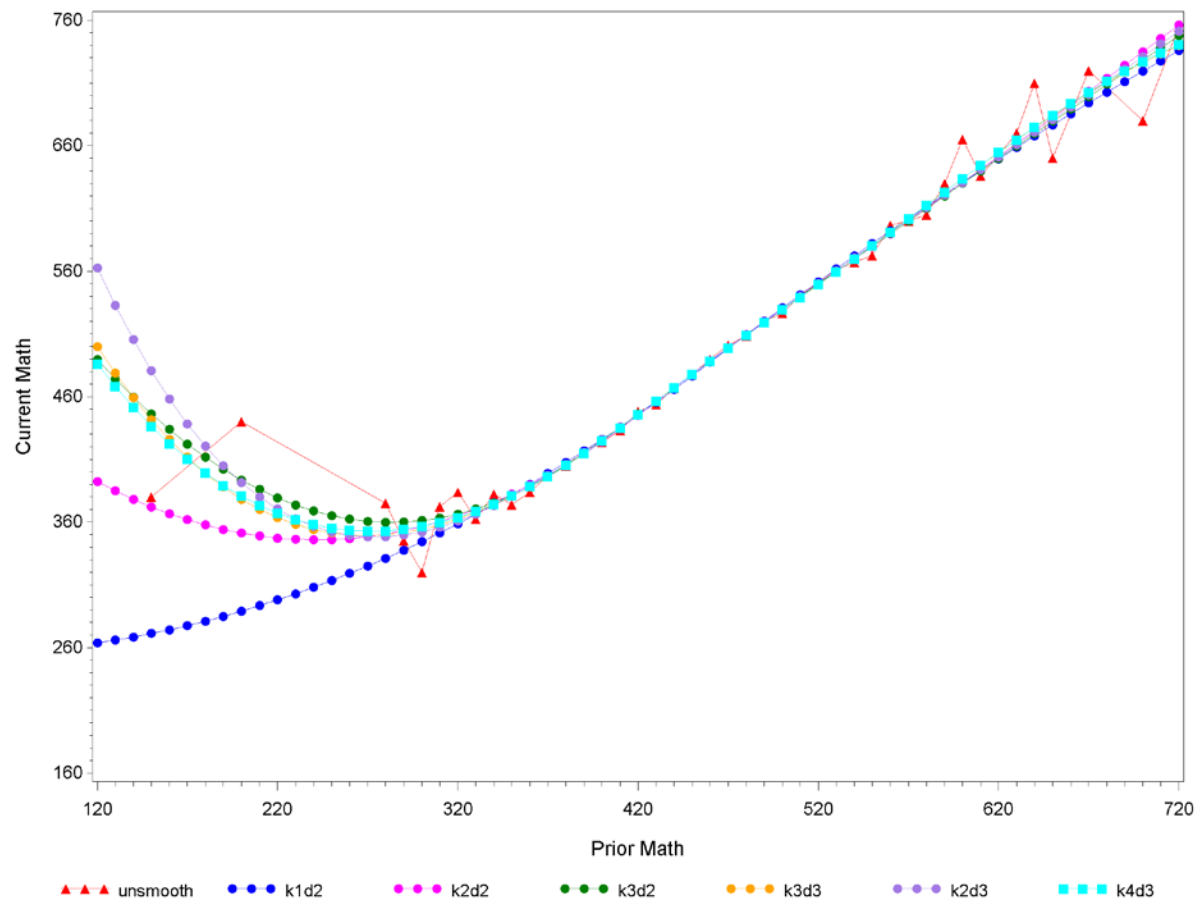
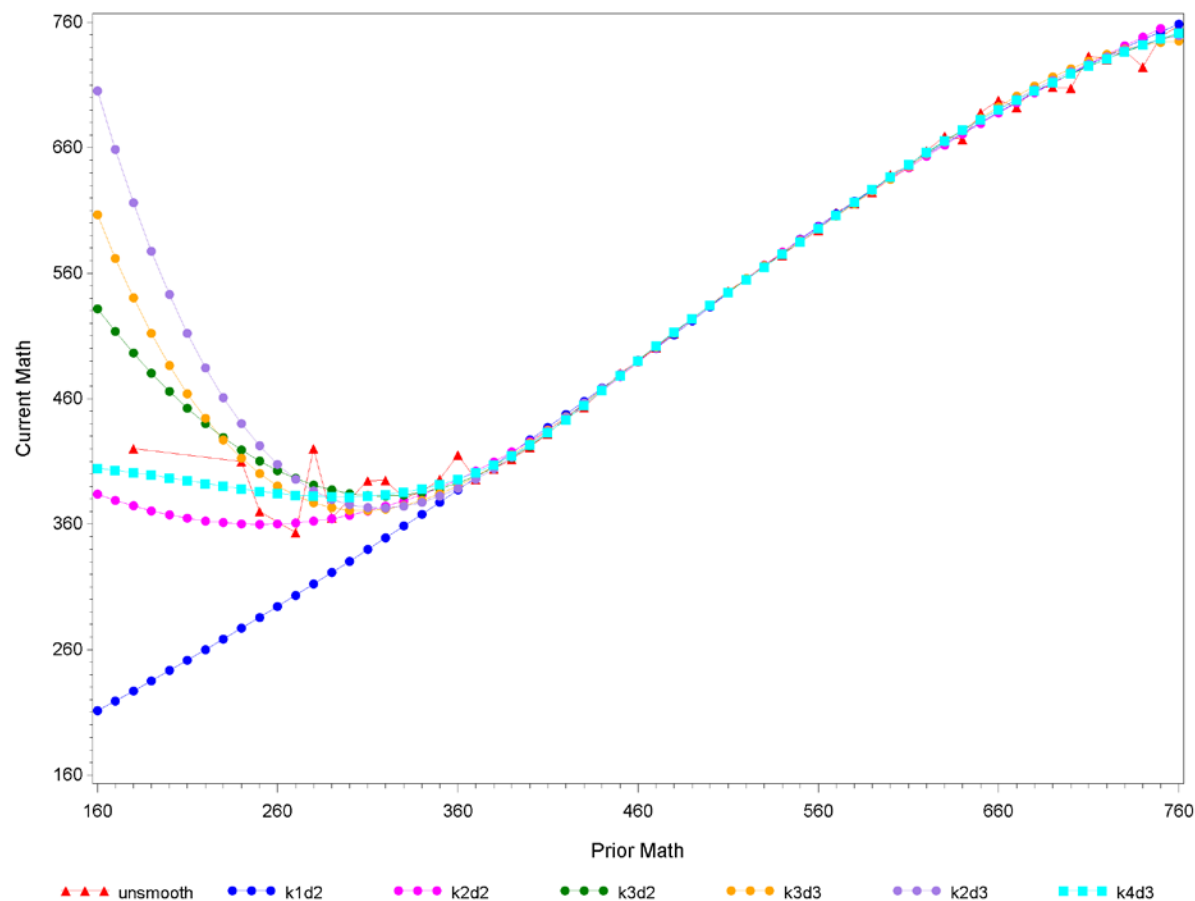
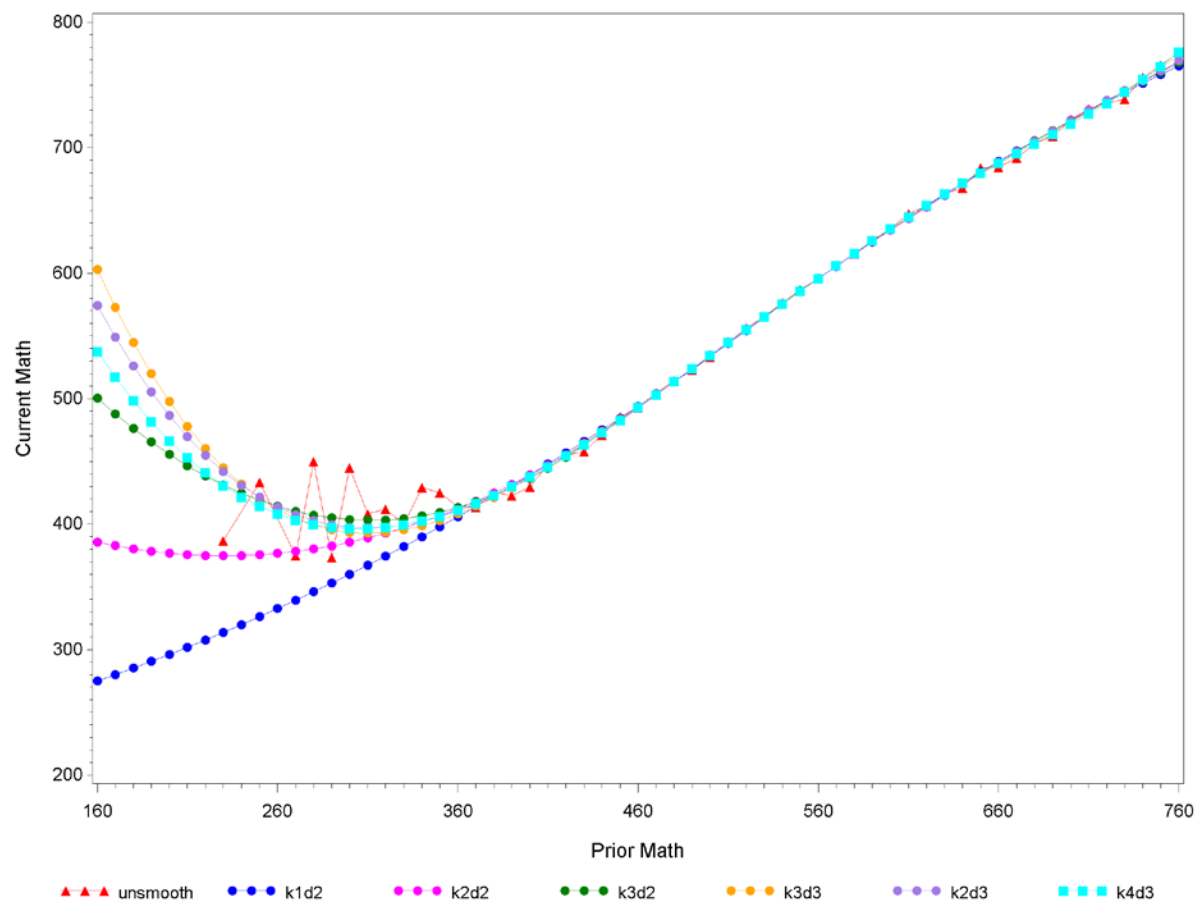


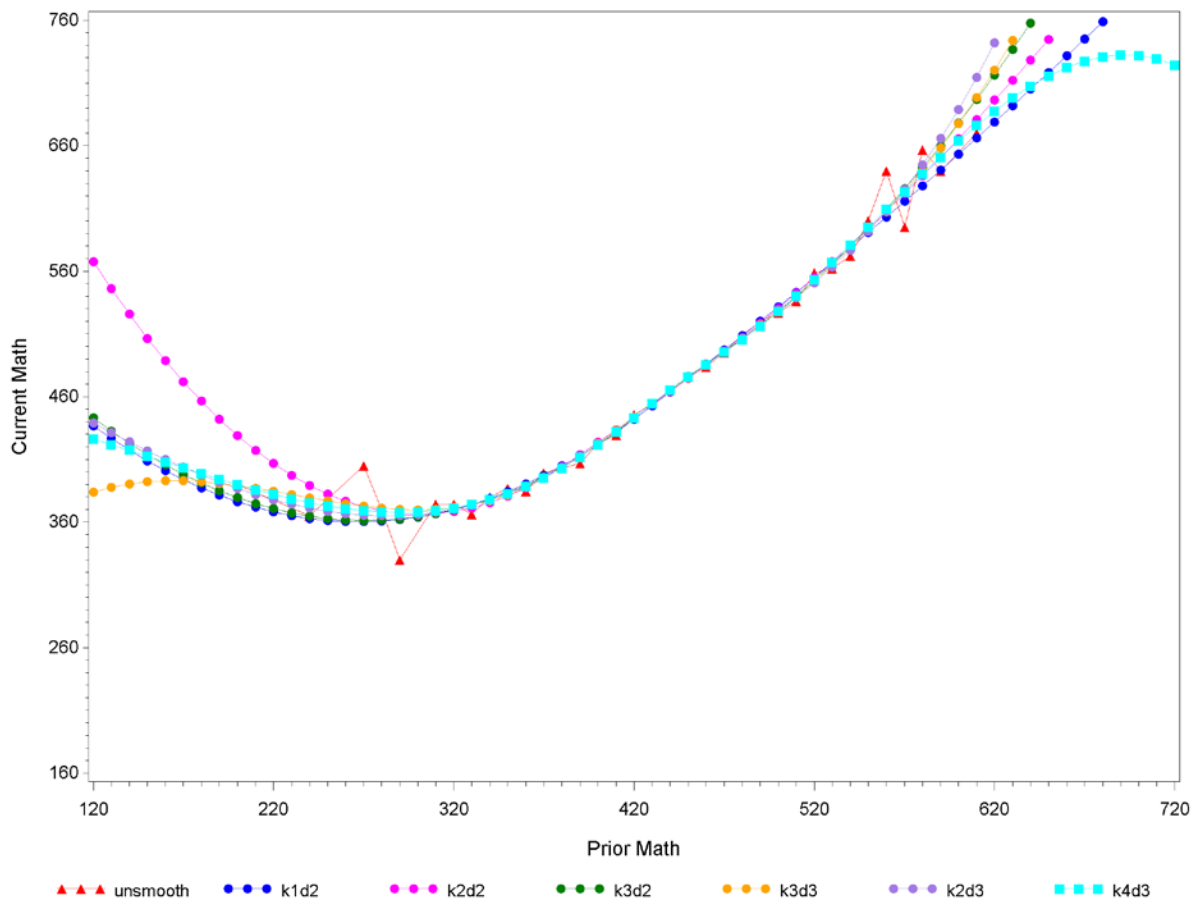
Figure 16: Math Conditional Mean for Group 3 (PSAT/NMSQT 10th Fall -to- PSAT/NMSQT 11th Fall)



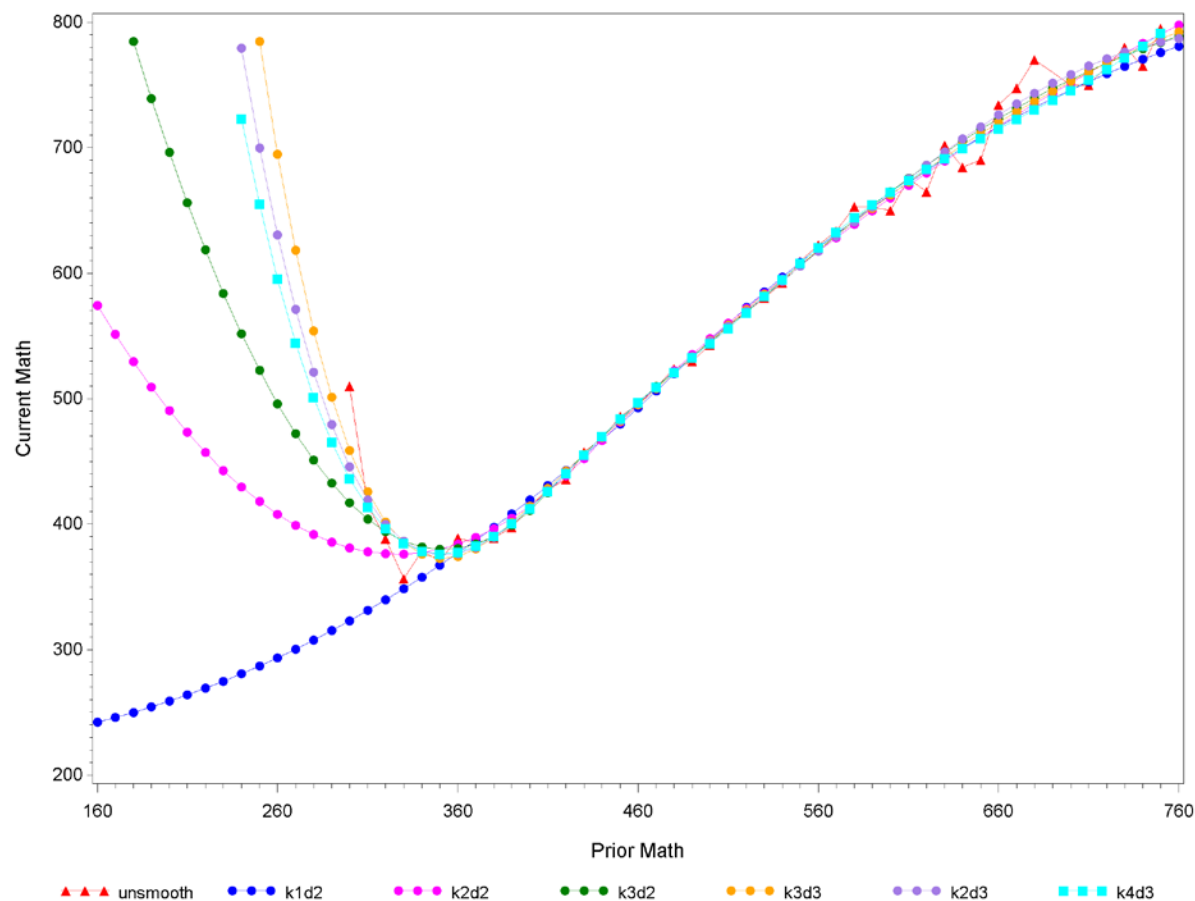
**Figure 17: Math Conditional Mean for Group 4 (PSAT/NMSQT 11th Fall -to- SAT 12th Fall)**



**Figure 18: Math Conditional Mean for Group 6 (PSAT 8/9 9th Spring -to- PSAT 10 10th Spring)**



**Figure 19: Math Conditional Mean for Group 7 (PSAT 10 10th Spring -to- SAT 11th Spring)**



**Figure 20: Math Conditional Mean for Group 8 (PSAT/NMSQT 11th Fall -to- SAT 11th Spring)**

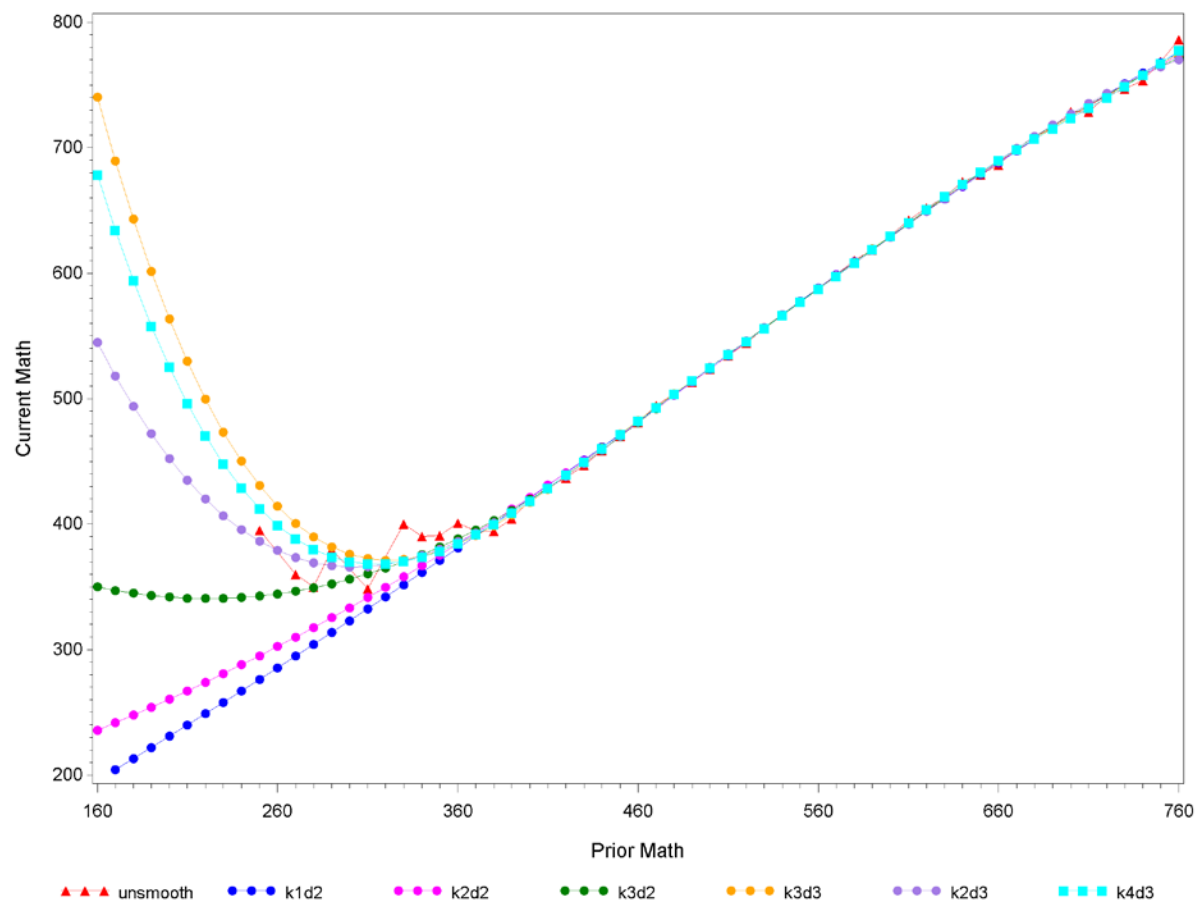
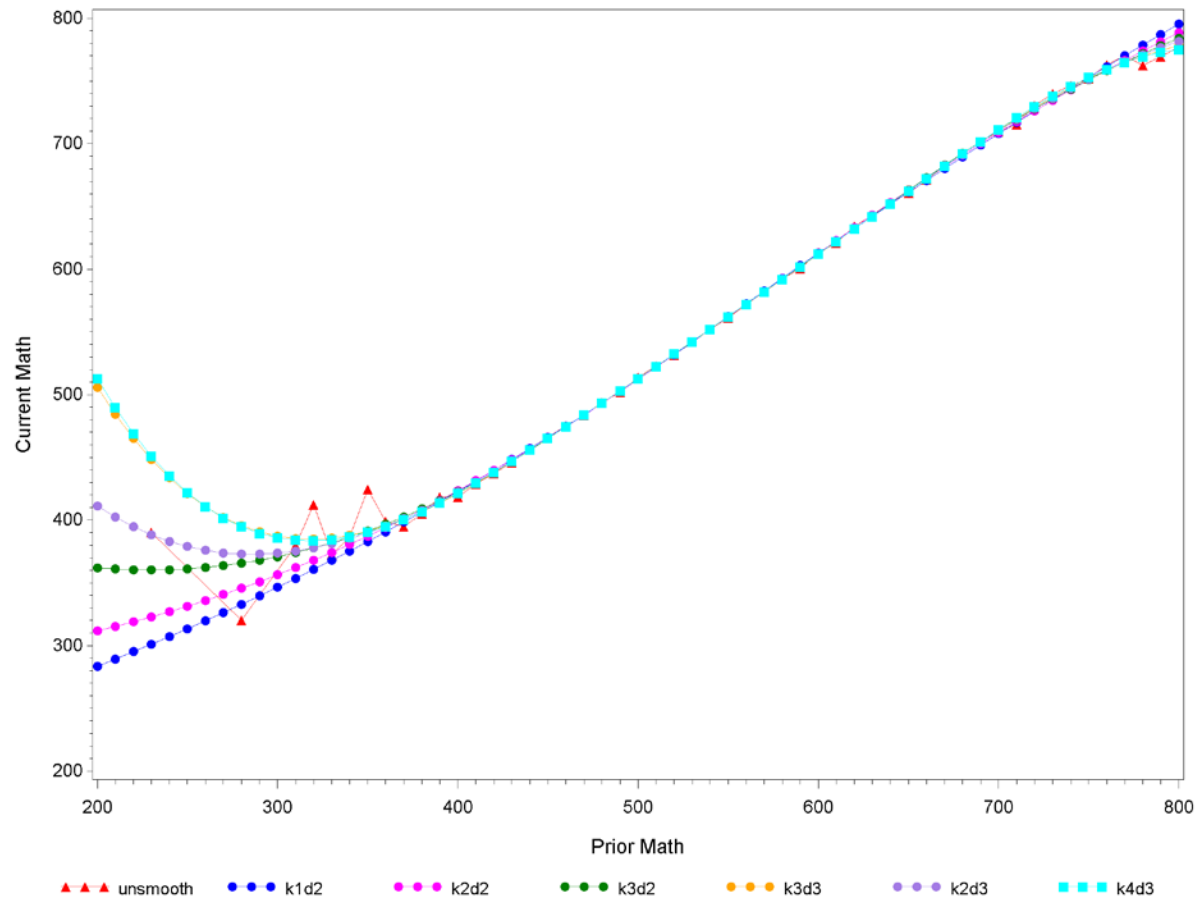
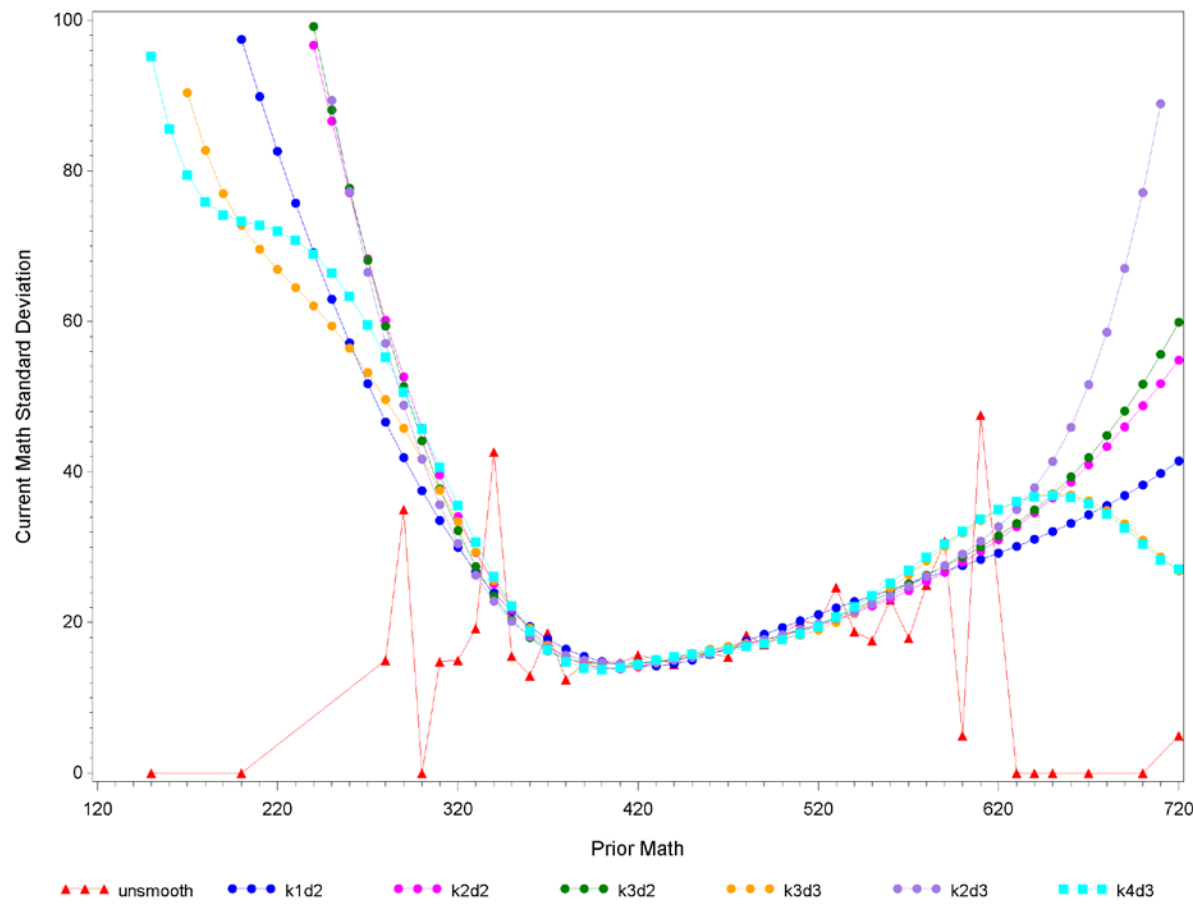




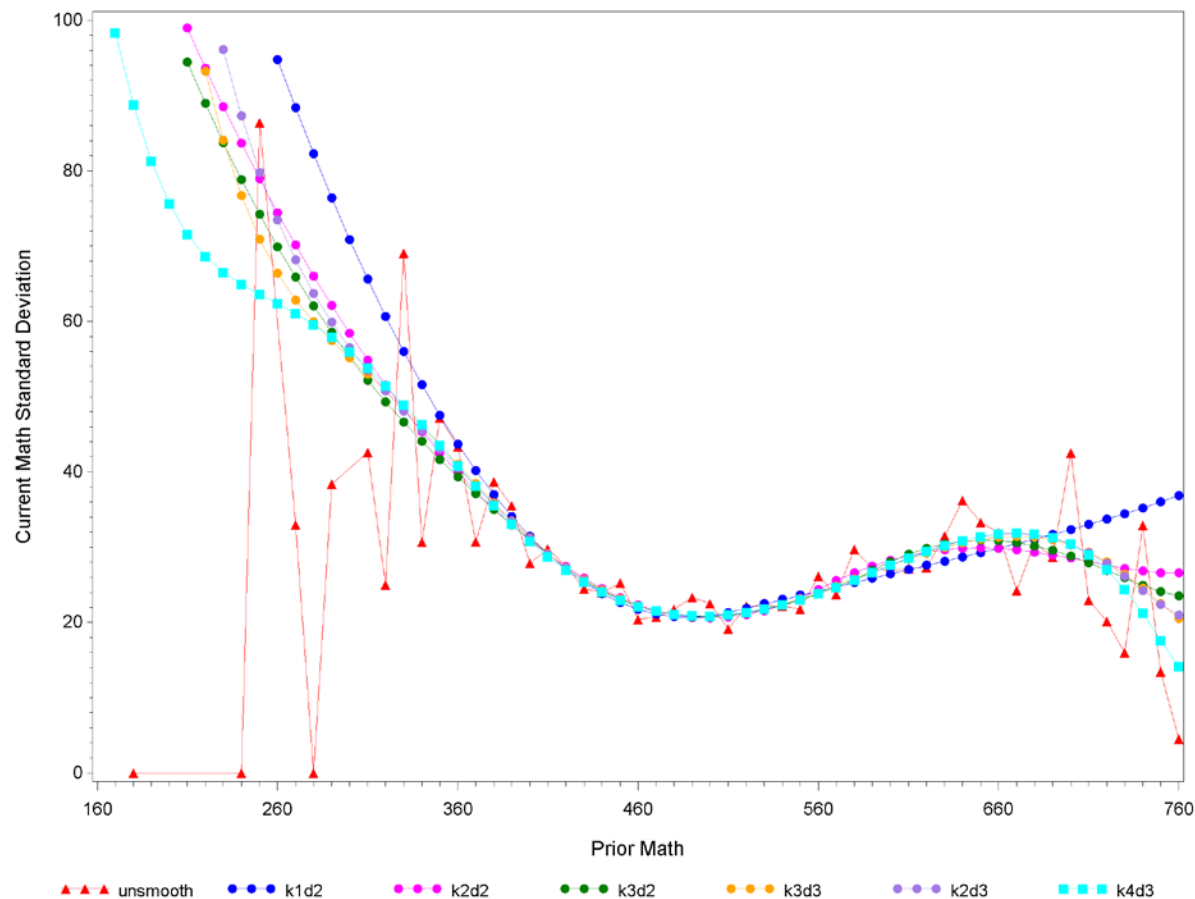
Figure 21: Math Conditional Mean for Group 9 (SAT 11th Spring -to- SAT 12th Fall)



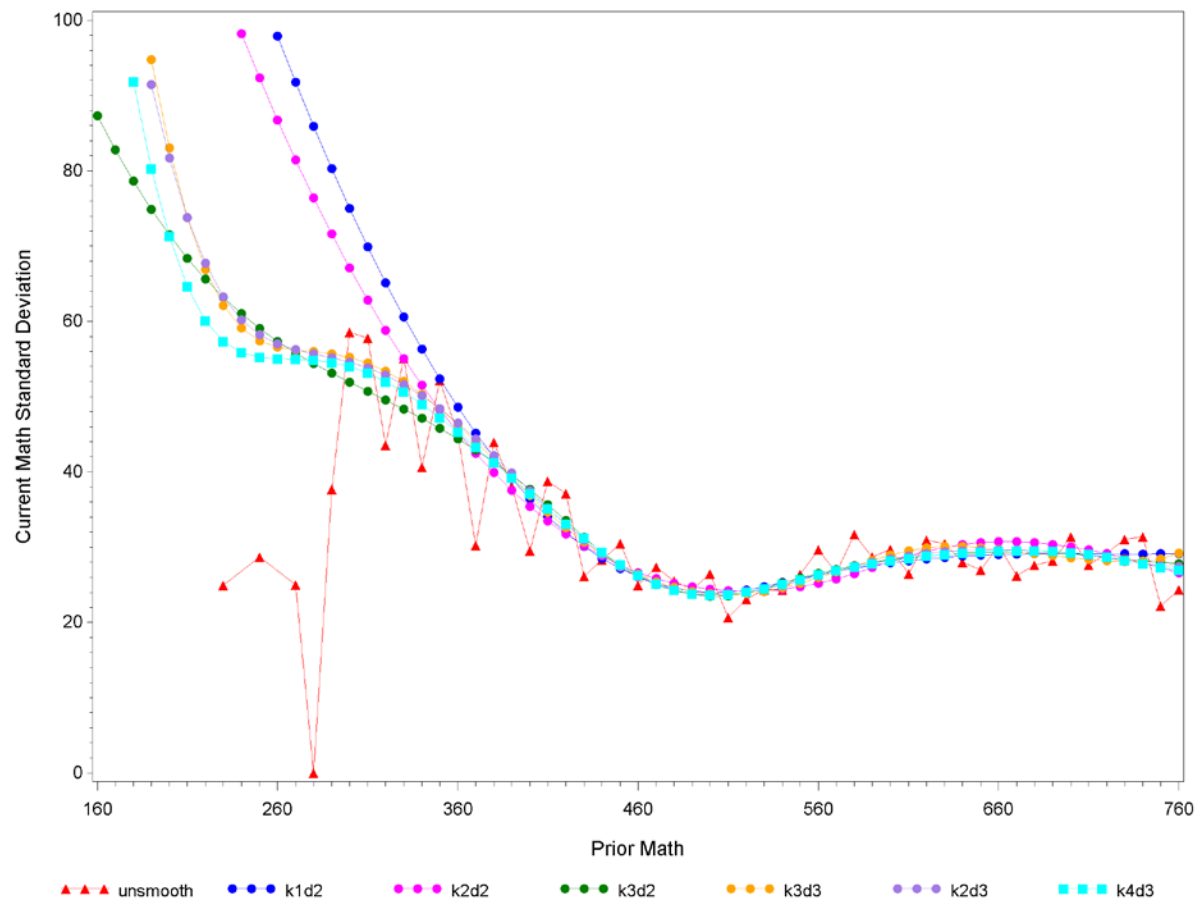
**Figure 22: Math Conditional Standard Deviation for Group 2 (PSAT 8/9 9th Fall -to- PSAT/NMSQT 10th Fall)**



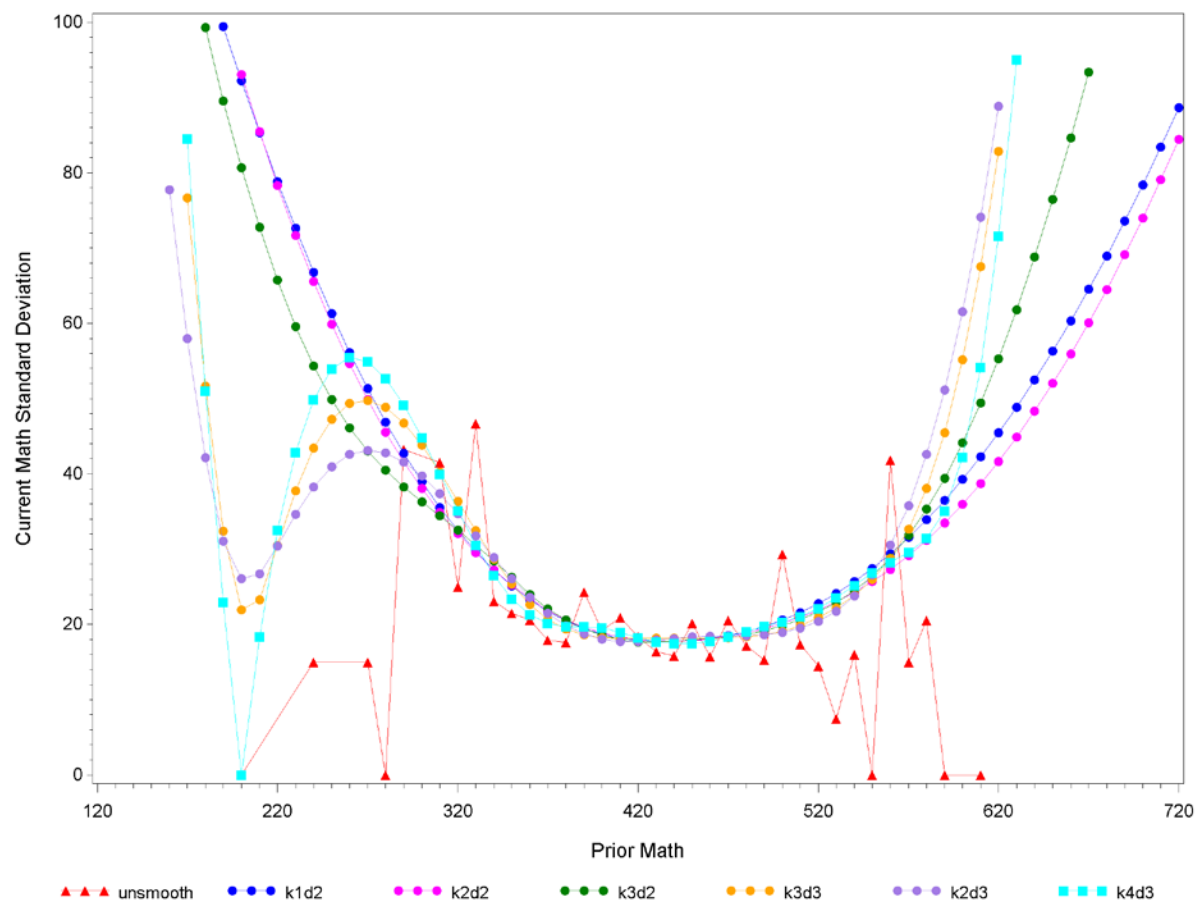
**Figure 23: Math Conditional Standard Deviation for Group 3 (PSAT/NMSQT 10th Fall -to- PSAT/NMSQT 11th Fall)**



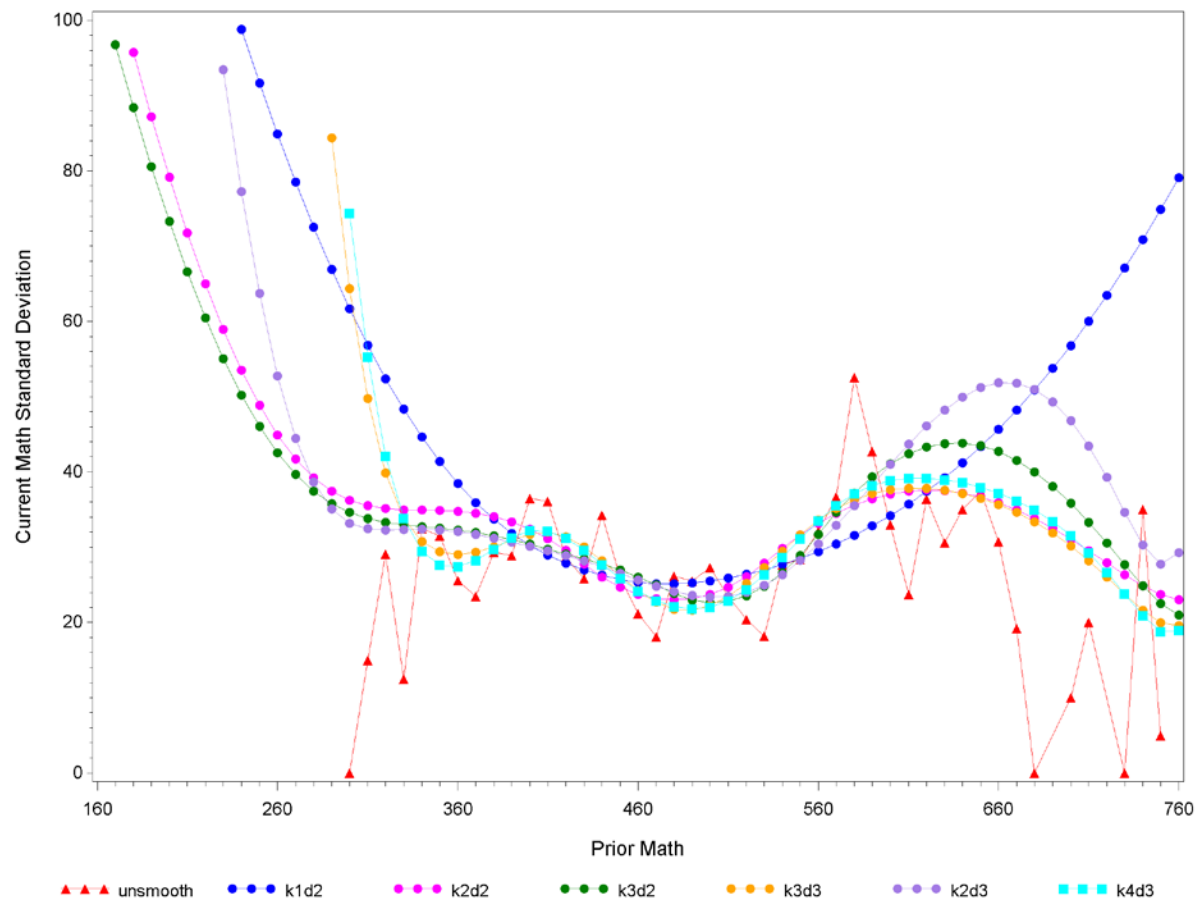
**Figure 24: Math Conditional Standard Deviation for Group 4 (PSAT/NMSQT 11th Fall -to- SAT 12th Fall)**



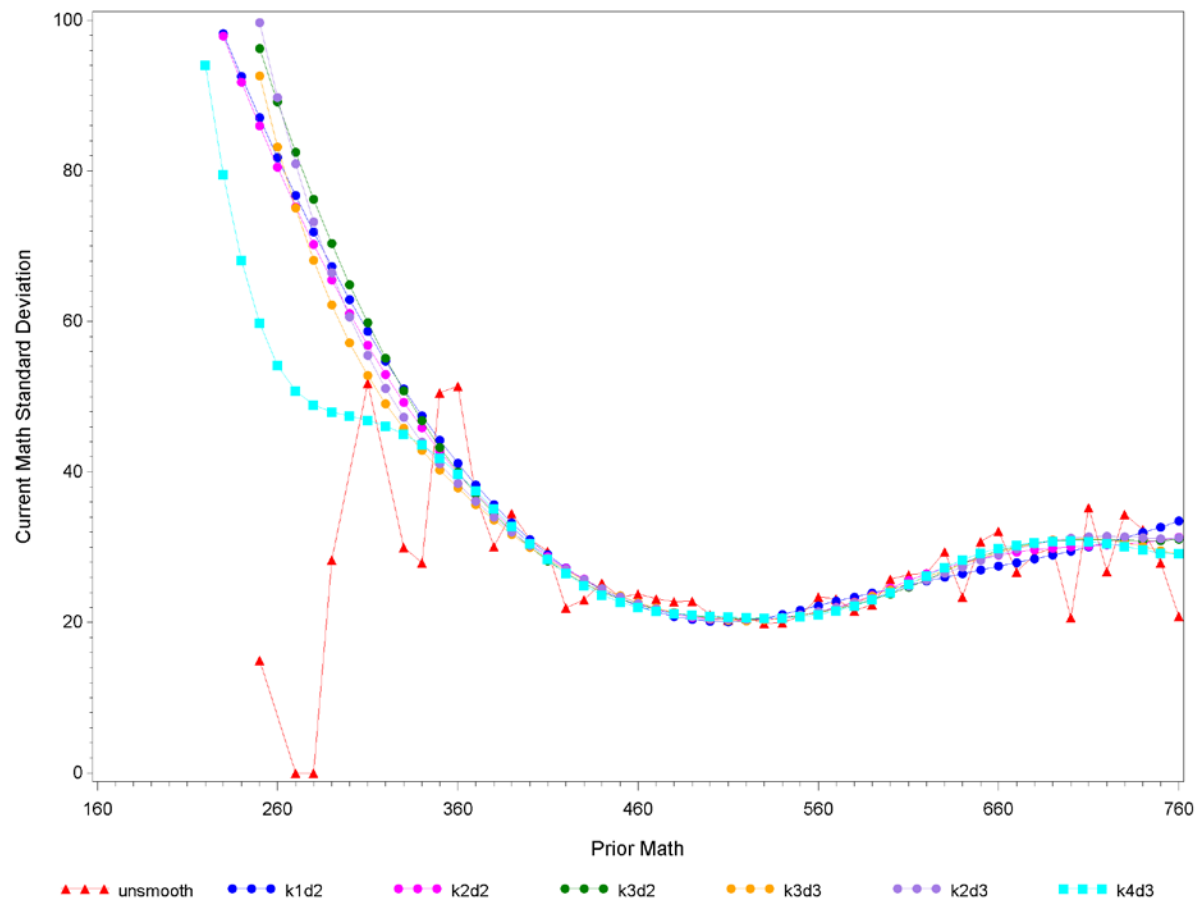
**Figure 25: Math Conditional Standard Deviation for Group 6 (PSAT 8/9 9th Spring -to- PSAT 10 10th Spring)**



**Figure 26: Math Conditional Standard Deviation for Group 7 (PSAT 10 10th Spring -to- SAT 11th Spring)**



**Figure 27: Math Conditional Standard Deviation for Group 8 (PSAT/NMSQT 11th Fall -to- SAT 11th Spring)**



**Figure 28: Math Conditional Standard Deviation for Group 9 (SAT 11th Spring -to- SAT 12th Fall)**

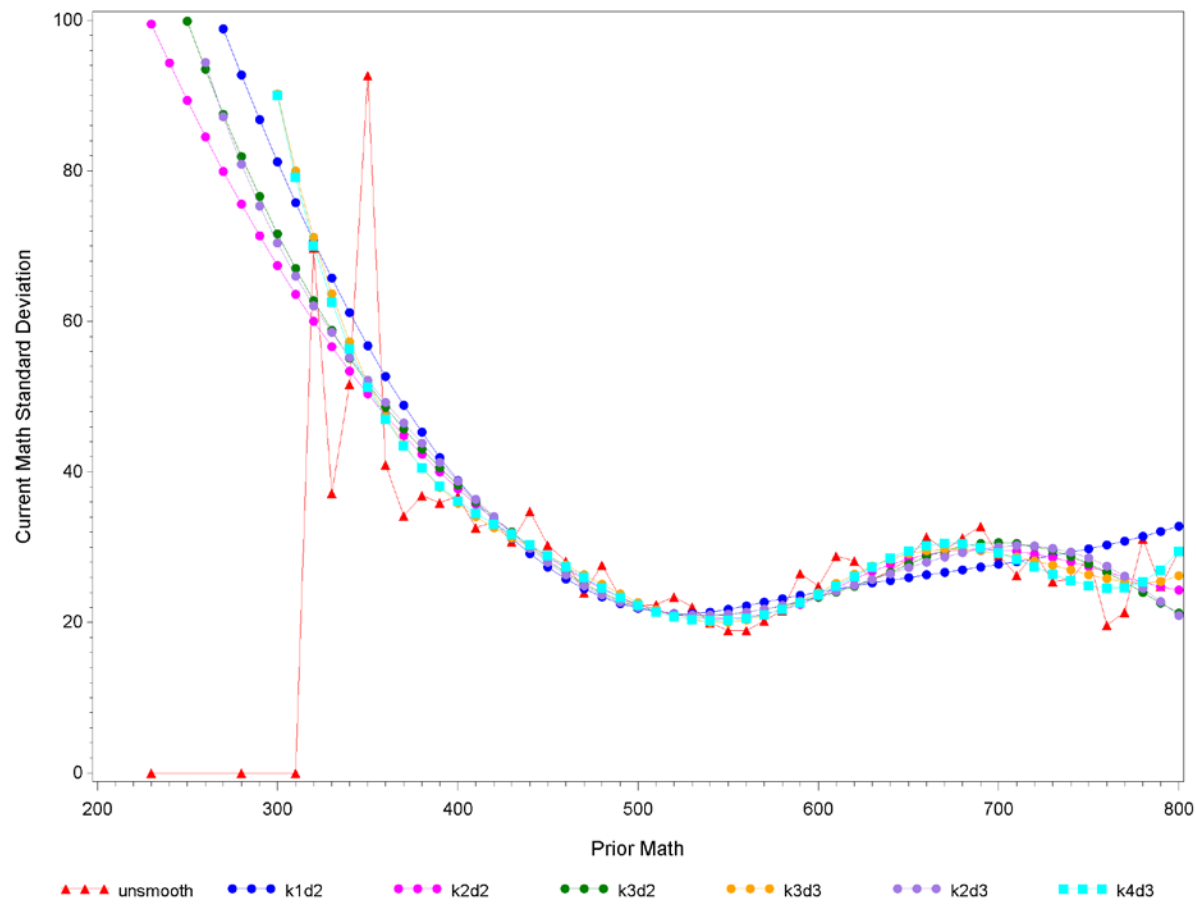




Figure 29: ERW Section Score Growth Results for Group 7: Before Adjustment

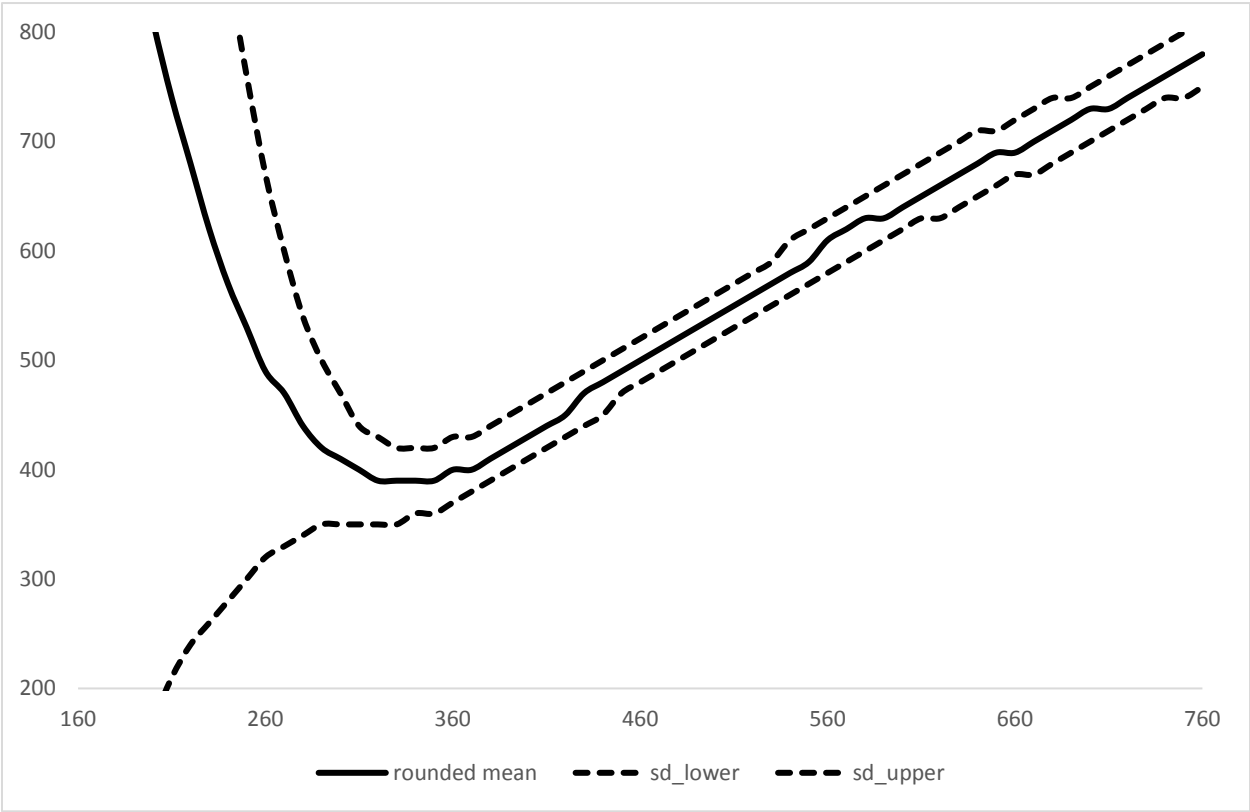


Figure 30: ERW Section Score Growth Results for Group 7: After Adjustment

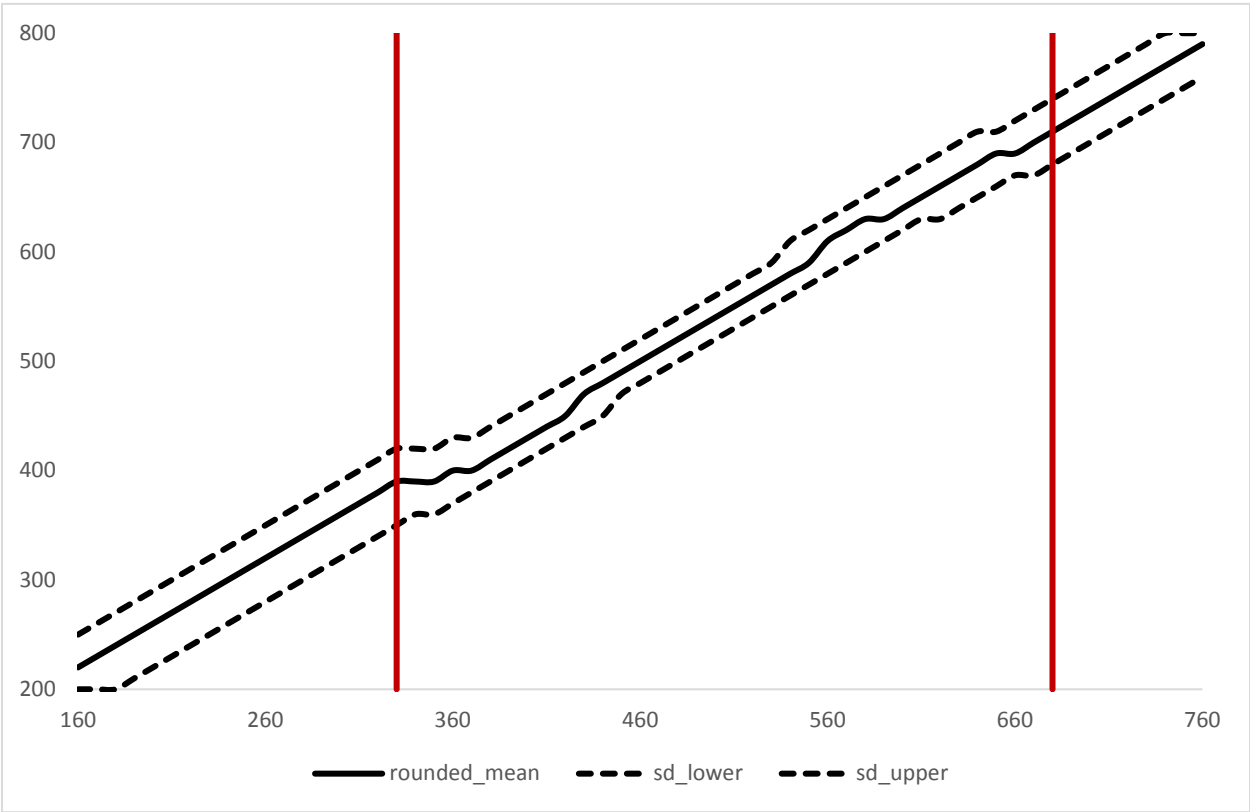


Figure 31: ERW Section Score Growth Range for Group 3

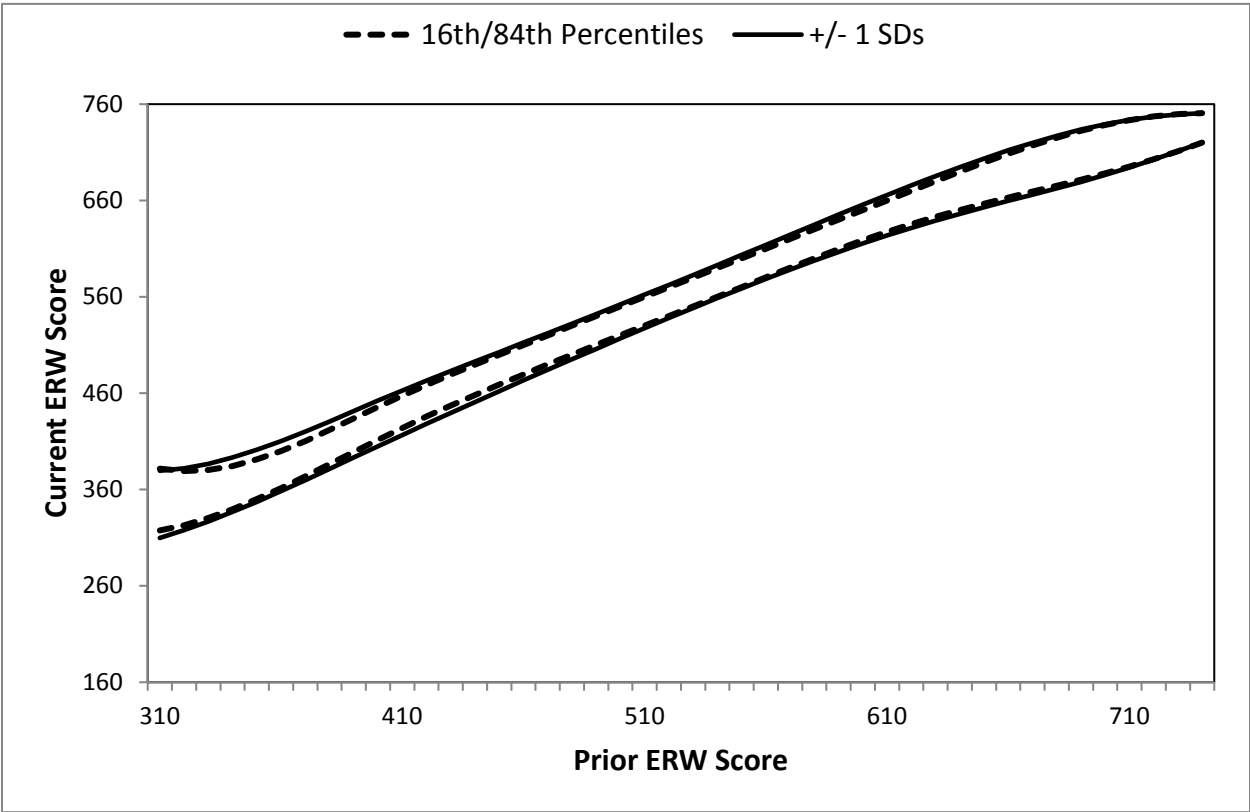
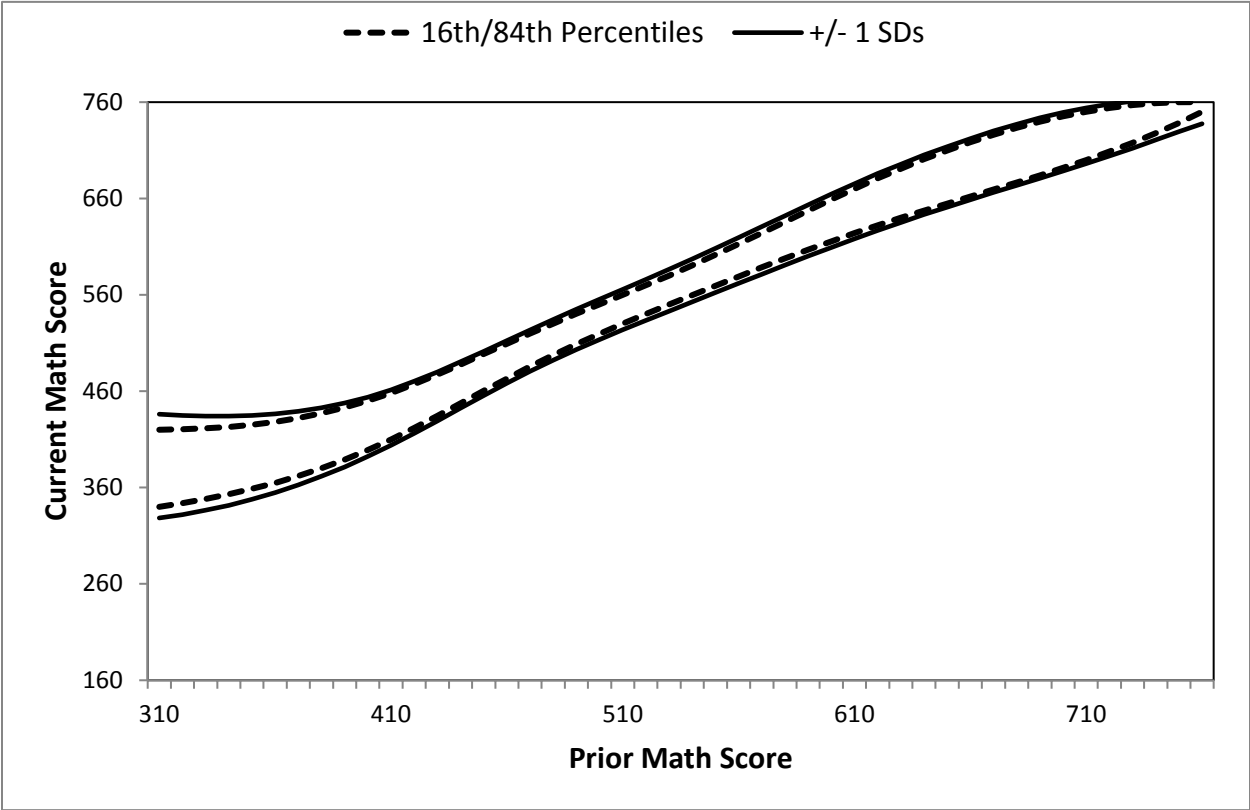


Figure 32: Math Section Score Growth Range for Group 3



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