

2010 TPM Projection Accuracy

Background

The Texas Projection Measure (TPM) was implemented in 2009. As part of the growth proposal to the United States Department of Education, TEA agreed to conduct annual evaluations of the projection accuracy of the TPM with respect to all students, student groups, and different subjects.

The TPM was first reported and used in 2009. The accuracy of these projections was evaluated after 2010 performance data were available. The projected values in 2009 were compared with observed values in 2010 to evaluate one-year projection accuracy for the methods employed in the subsequent year.

The purpose of this document is to present the results of the 2009 to 2010 TPM projection accuracy analyses as part of the ongoing evaluation of the reliability and validity of the TPM.

Analyses

The projection accuracy of the TPM was evaluated in two ways: 1) the classification accuracy of students projected to either “meet the standard” or “not meet the standard” was evaluated, and 2) the projected score means were analyzed. The projection accuracy of the TPM was evaluated for the subjects in the grades presented in Table 1. Projection scores were also generated in 2009 for testers in grades 3, 5, 6, 8, and 9, as well as grade 4 writing. However, the projection accuracy for these grades cannot be evaluated in 2010 because the observed values for these projections are not available in 2010.

Table 1. TPM Projection Accuracy Analysis Grades and Subjects

Grade in 2009	Grade in 2010	Language Version	Subjects
4	5	English	Reading
			Mathematics
		Spanish	Reading
			Mathematics
7	8	English	Reading
			Mathematics
10	11	English	English Language Arts
			Mathematics
			Science
			Social Studies

The results are presented in three sections. The first section summarizes the overall classification accuracy and projected score mean differences, the second section provides a high-level summary of the overall trends, and the third section breaks down the trends by student groups.

Overall Results

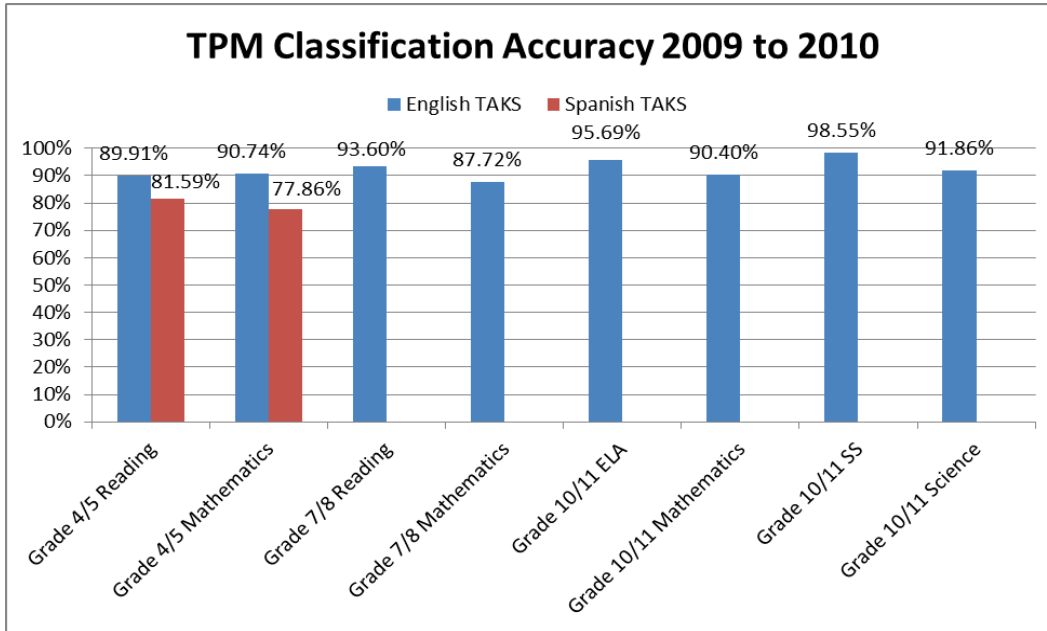


Figure 1 TPM classification accuracy (2009–2010)

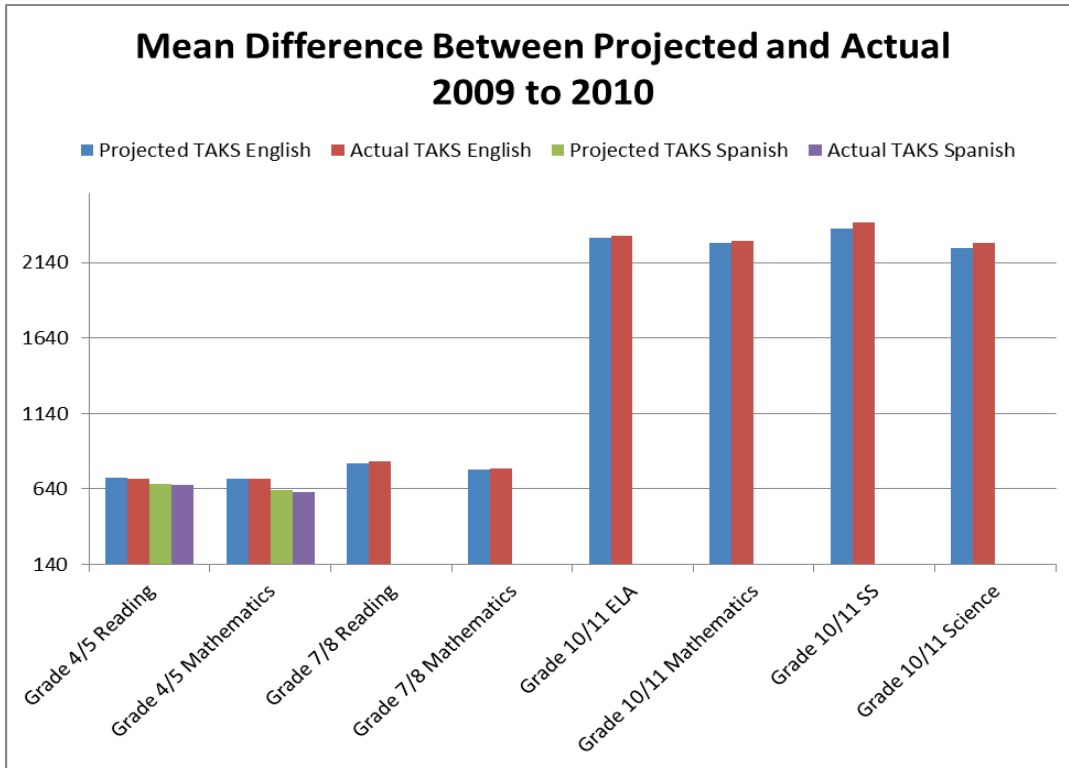


Figure 2 Mean difference between projected and actual (2009–2010)

Results Summarized Across All Grades and Subjects

Projection Accuracy

- The highest classification accuracy percentages were in grades 10/11 social studies across all student groups (see Table 2).
- The lowest classification accuracy percentages were in Spanish versions of grades 4/5 mathematics (see Table 3).
- The classification accuracy is generally higher for reading than for mathematics for both English and Spanish versions (see Figure 1).
- The classification accuracy for the English versions of the TAKS is higher than the classification accuracy for Spanish versions of the TAKS (see Figure 1).
- For English TAKS, the classification accuracy for special education and LEP groups is lower than for other student groups (see Table 2).
- In general, the magnitude of the mean differences between projected and actual scores was:
 - smaller for reading and mathematics than for social studies and science for the English versions of the TAKS (see Table 4);
 - smaller for English versions of the TAKS than for Spanish versions of the TAKS (see Tables 4 and 5);

Inaccurate Projections

- There were few inaccurate classifications overall.
- When projections were inaccurate, over projections were more common than under projections.
 - In general, students were more likely to be projected to meet the standard without actually meeting it, except for grade 10–11 mathematics and science (see Tables 2 and 3).

Results Summarized By Student Group

(Note: the results in this section do not include African American students and white students who took Spanish TAKS tests because of the limited group sizes).

All Students

- The classification accuracy percentages for all students across grades and subjects ranged from 78% to 99% with an overall average of 90% (see Tables 2 and 3).
 - Highest classification accuracy percentage:
 - 98.55% for grades 10/11 English social studies.
 - Lowest classification accuracy percentage:
 - 77.86% for grades 4/5 Spanish mathematics.
- The difference between projected and actual score means, which is calculated by subtracting the actual score from the projected score, ranged from -42.12 for grades 10/11 social studies to 16.39 for grades 4/5 Spanish mathematics (see Tables 4 and 5).

African American

- The classification accuracy percentages for African American students ranged from 82% to 98% with an average of 89%.
 - Highest classification accuracy percentage:
 - 97.77% for grades 10/11 English social studies.
 - Lowest classification accuracy percentage:
 - 82.46% for grades 7/8 English mathematics.
- The difference between projected and actual score means, which is calculated by subtracting the actual score from the projected score, ranged from -32.46 for grades 10/11 social studies to 13.18 for grades 4/5 English mathematics.

Hispanic

- The classification accuracy percentages for Hispanic students ranged from 78% to 98% with an average of 90%.
 - Highest classification accuracy percentage:
 - 97.84% for grades 10/11 social studies.
 - Lowest classification accuracy percentage:
 - 77.81% for grades 4/5 Spanish mathematics.
- The difference between projected and actual score means, which is calculated by subtracting the actual score from the projected score, ranged from -34.90 for grades 10/11 social studies to 16.52 for grades 4/5 Spanish mathematics.

White

- The classification accuracy percentages for white students ranged from 92% to 99% with an average of 96%.
 - Highest classification accuracy percentage:
 - 99.42% for grades 10/11 social studies.
 - Lowest classification accuracy percentage:
 - 91.88% for grades 7/8 mathematics.
- The difference between projected and actual score means, which is calculated by subtracting the actual score from the projected score, ranged from -52.74 for grades 10/11 social studies to 0.34 for grades 4/5 English reading.

Economically Disadvantaged

- The classification accuracy percentages for economically disadvantaged students ranged from 78% to 98% with an average of 89%.
 - Highest classification accuracy percentage:
 - 97.61% for grades 10/11 social studies.
 - Lowest classification accuracy percentage:
 - 77.68% for grades 4/5 Spanish mathematics.
- The difference between projected and actual score means, which is calculated by subtracting the actual score from the projected score,

ranged from -32.02 for grades 10/11 social studies to 16.50 for grades 4/5 Spanish mathematics.

Special Education

- The classification accuracy percentages for special education students ranged from 76% to 91% with an average of 82%.
 - Highest classification accuracy percentage:
 - 90.75% for grades 10/11 social studies.
 - Lowest classification accuracy percentage:
 - 75.53% for grades 4/5 Spanish mathematics.
- The difference between projected and actual score means, which is calculated by subtracting the actual score from the projected score, ranged from -31.82 for grades 10/11 science to 23.27 for grades 4/5 Spanish reading.

LEP

- The classification accuracy percentages for students with limited English proficiency ranged from 73% to 91% with an average of 82%.
 - Highest classification accuracy percentage:
 - 90.54% for grades 10/11 social studies.
 - Lowest classification accuracy percentage:
 - 72.80% for grades 10/11 science.
- The difference between projected and actual score means, which is calculated by subtracting the actual score from the projected score, ranged from -37.68 for grades 10/11 mathematics to 28.30 for grades 10/11 English language arts.

Summary

The results of the TPM projection accuracy analyses in 2010 were similar to the results submitted as evidence to support the model in the growth proposal to the USDE. The overall reading classification accuracy tended to be higher than the mathematics classification accuracy. The accuracy for English TAKS projections was higher than for Spanish TAKS projections. The projection accuracy for students in the special education and limited English proficient student groups tended to be lower than for students in other student groups.

Table 2. English TAKS Classification Accuracy for the TPM from 2009 to 2010

Grade/ Subject	Group	N (Pct. Relative to All Students)	Total Projection Accuracy (Pct. Relative to the Group)		Accurate Classifications (Pct. Relative to the Group)		Misclassifications (Pct. Relative to the Group)	
			Accurate Projections	Inaccurate Projections	MS	DNM	MS (Under Projection)	DNM (Over Projection)
Grade 4 to Grade 5 Reading	All Students	295293 (100.00)	265204 (89.81)	30089 (10.19)	248494 (84.15)	16710 (5.66)	8166 (2.77)	21923 (7.42)
	African American	40890 (13.85)	35118 (85.88)	5772 (14.12)	31228 (76.37)	3890 (9.51)	2022 (4.94)	3750 (9.17)
	Hispanic	134348 (45.50)	116958 (87.06)	17390 (12.94)	106800 (79.50)	10158 (7.56)	4430 (3.30)	12960 (9.65)
	White	107582 (36.43)	101188 (94.06)	6394 (5.94)	98818 (91.85)	2370 (2.20)	1597 (1.48)	4797 (4.46)
	Economically Disadvantaged	163407 (55.34)	140460 (85.96)	22947 (14.04)	126441 (77.38)	14019 (8.58)	6301 (3.86)	16646 (10.19)
	Special Education	13697 (4.64)	11255 (82.17)	2442 (17.83)	9203 (67.19)	2052 (14.98)	750 (5.48)	1692 (12.35)
	Limited English Proficient	47004 (15.92)	38925 (82.81)	8079 (17.19)	33472 (71.21)	5453 (11.60)	1865 (3.97)	6214 (13.22)
Grade 4 to Grade 5 Mathematics	All Students	295595 (100.00)	268225 (90.74)	27370 (9.26)	253311 (85.70)	14914 (5.04)	5054 (1.71)	22316 (7.55)
	African American	40852 (13.82)	34597 (84.69)	6255 (15.31)	30677 (75.09)	3920 (9.60)	1084 (2.65)	5171 (12.66)
	Hispanic	134608 (45.54)	119815 (89.01)	14793 (10.99)	111517 (82.85)	8298 (6.16)	2791 (2.07)	12002 (8.92)
	White	107652 (36.42)	101681 (94.45)	5971 (5.55)	99194 (92.14)	2487 (2.31)	1075 (1.00)	4896 (4.55)
	Economically Disadvantaged	163622 (55.35)	142907 (87.34)	20715 (12.66)	130780 (79.93)	12127 (7.41)	3823 (2.34)	16892 (10.32)
	Special Education	13740 (4.65)	11545 (84.02)	2195 (15.98)	9704 (70.63)	1841 (13.40)	493 (3.59)	1702 (12.39)
	Limited English Proficient	47201 (15.97)	41141 (87.16)	6060 (12.84)	37284 (78.99)	3857 (8.17)	1291 (2.74)	4769 (10.10)

Table 2. Continued

Grade/ Subject	Group	N (Pct. Relative to All Students)	Total Projection Accuracy (Pct. Relative to the Group)		Accurate Classifications (Pct. Relative to the Group)		Misclassifications (Pct. Relative to the Group)	
			Accurate Projections	Inaccurate Projections	MS	DNM	MS (Under Projection)	DNM (Over Projection)
Grade 7 to Grade 8 Reading	All Students	297861 (100.00)	278795 (93.60)	19066 (6.40)	267826 (89.92)	10969 (3.68)	4930 (1.66)	14136 (4.75)
	African American	39891 (13.39)	36484 (91.46)	3407 (8.54)	34542 (86.59)	1942 (4.87)	990 (2.48)	2417 (6.06)
	Hispanic	137615 (46.20)	125900 (91.49)	11715 (8.51)	118283 (85.95)	7617 (5.54)	3064 (2.23)	8651 (6.29)
	White	107977 (36.25)	104333 (96.63)	3644 (3.37)	103166 (95.54)	1167 (1.08)	818 (0.76)	2826 (2.62)
	Economically Disadvantaged	156943 (52.69)	142457 (90.77)	14486 (9.23)	133281 (84.92)	9176 (5.85)	3896 (2.48)	10590 (6.75)
	Special Education	13846 (4.65)	11279 (81.46)	2567 (18.54)	9052 (65.38)	2227 (16.08)	773 (5.58)	1794 (12.96)
	Limited English Proficient	24452 (8.21)	19627 (80.27)	4825 (19.73)	14496 (59.28)	5131 (20.98)	1543 (6.31)	3282 (13.42)
Grade 7 to Grade 8 Mathematics	All Students	297647 (100.00)	261107 (87.72)	36540 (12.28)	231080 (77.64)	30027 (10.09)	12277 (4.12)	24263 (8.15)
	African American	39783 (13.37)	32805 (82.46)	6978 (17.54)	25942 (65.21)	6863 (17.25)	2207 (5.55)	4771 (11.99)
	Hispanic	137596 (46.23)	117280 (85.24)	20316 (14.76)	99319 (72.18)	17961 (13.05)	7266 (5.28)	13050 (9.48)
	White	107890 (36.25)	99127 (91.88)	8763 (8.12)	94320 (87.42)	4807 (4.46)	2586 (2.40)	6177 (5.73)
	Economically Disadvantaged	156841 (52.69)	131690 (83.96)	25151 (16.04)	108671 (69.29)	23019 (14.68)	8748 (5.58)	16403 (10.46)
	Special Education	13527 (4.54)	10589 (78.28)	2938 (21.72)	6102 (45.11)	4487 (33.17)	1336 (9.88)	1602 (11.84)
	Limited English Proficient	24472 (8.22)	19240 (78.62)	5232 (21.38)	12309 (50.30)	6931 (28.32)	2781 (11.36)	2451 (10.02)

Table 2. Continued

Grade/ Subject	Group	N (Pct. Relative to All Students)	Total Projection Accuracy (Pct. Relative to the Group)		Accurate Classifications (Pct. Relative to the Group)		Misclassifications (Pct. Relative to the Group)	
			Accurate Projections	Inaccurate Projections	MS	DNM	MS (Under Projection)	DNM (Over Projection)
Grade 10 to Grade 11 English Language Arts	All Students	246434 (100.00)	235805 (95.69)	10629 (4.31)	232056 (94.17)	3749 (1.52)	1115 (0.45)	9514 (3.86)
	African American	33303 (13.51)	31303 (93.99)	2000 (6.01)	30646 (92.02)	657 (1.97)	226 (0.68)	1774 (5.33)
	Hispanic	102438 (41.57)	96598 (94.30)	5840 (5.70)	93973 (91.74)	2625 (2.56)	681 (0.66)	5159 (5.04)
	White	99665 (40.44)	97131 (97.46)	2534 (2.54)	96763 (97.09)	368 (0.37)	193 (0.19)	2341 (2.35)
	Economically Disadvantaged	106050 (43.03)	99074 (93.42)	6976 (6.58)	96171 (90.68)	2903 (2.74)	755 (0.71)	6221 (5.87)
	Special Education	10389 (4.22)	8164 (78.58)	2225 (21.42)	6989 (67.27)	1175 (11.31)	290 (2.79)	1935 (18.63)
	Limited English Proficient	11960 (4.85)	9414 (78.71)	2546 (21.29)	7317 (61.18)	2097 (17.53)	342 (2.86)	2204 (18.43)
Grade 10 to Grade 11 Mathematics	All Students	245023 (100.00)	221511 (90.40)	23512 (9.60)	204855 (83.61)	16656 (6.80)	17392 (7.10)	6120 (2.50)
	African American	32992 (13.46)	28096 (85.16)	4896 (14.84)	24133 (73.15)	3963 (12.01)	3544 (10.74)	1352 (4.10)
	Hispanic	101822 (41.56)	89001 (87.41)	12821 (12.59)	79598 (78.17)	9403 (9.23)	9744 (9.57)	3077 (3.02)
	White	99192 (40.48)	93758 (94.52)	5434 (5.48)	90729 (91.47)	3029 (3.05)	3839 (3.87)	1595 (1.61)
	Economically Disadvantaged	105158 (42.92)	90806 (86.35)	14352 (13.65)	79967 (76.04)	10839 (10.31)	10754 (10.23)	3598 (3.42)
	Special Education	9614 (3.92)	7533 (78.35)	2081 (21.65)	3986 (41.46)	3547 (36.89)	1618 (16.83)	463 (4.82)
	Limited English Proficient	11780 (4.81)	8708 (73.92)	3072 (26.08)	5478 (46.50)	3230 (27.42)	2532 (21.49)	540 (4.58)

Table 2. Continued

Grade/ Subject	Group	N (Pct. Relative to All Students)	Total Projection Accuracy (Pct. Relative to the Group)		Accurate Classifications (Pct. Relative to the Group)		Misclassifications (Pct. Relative to the Group)	
			Accurate Projections	Inaccurate Projections	MS	DNM	MS (Under Projection)	DNM (Over Projection)
Grade 10 to Grade 11 Social Studies	All Students	241382 (100.00)	237893 (98.55)	3489 (1.45)	237368 (98.34)	525 (0.22)	530 (0.22)	2959 (1.23)
	African American	32685 (13.54)	31956 (97.77)	729 (2.23)	31830 (97.38)	126 (0.39)	139 (0.43)	590 (1.81)
	Hispanic	99702 (41.30)	97548 (97.84)	2154 (2.16)	97215 (97.51)	333 (0.33)	321 (0.32)	1833 (1.84)
	White	98200 (40.68)	97627 (99.42)	573 (0.58)	97567 (99.36)	60 (0.06)	67 (0.07)	506 (0.52)
	Economically Disadvantaged	102999 (42.67)	100537 (97.61)	2462 (2.39)	100139 (97.22)	398 (0.39)	396 (0.38)	2066 (2.01)
	Special Education	10127 (4.20)	9190 (90.75)	937 (9.25)	8960 (88.48)	230 (2.27)	129 (1.27)	808 (7.98)
	Limited English Proficient	10321 (4.28)	9345 (90.54)	976 (9.46)	9141 (88.57)	204 (1.98)	195 (1.89)	781 (7.57)
Grade 10 to Grade 11 Science	All Students	243130 (100.00)	223328 (91.86)	19802 (8.14)	211185 (86.86)	12143 (4.99)	15037 (6.18)	4765 (1.96)
	African American	32778 (13.48)	28440 (86.77)	4338 (13.23)	25815 (78.76)	2625 (8.01)	3443 (10.50)	895 (2.73)
	Hispanic	100919 (41.51)	89338 (88.52)	11581 (11.48)	81457 (80.72)	7881 (7.81)	8673 (8.59)	2908 (2.88)
	White	98448 (40.49)	94906 (96.40)	3542 (3.60)	93486 (94.96)	1420 (1.44)	2670 (2.71)	872 (0.89)
	Economically Disadvantaged	104226 (42.87)	91265 (87.56)	12961 (12.44)	82524 (79.18)	8741 (8.39)	9821 (9.42)	3140 (3.01)
	Special Education	9691 (3.99)	7542 (77.82)	2149 (22.18)	4986 (51.45)	2556 (26.37)	1786 (18.43)	363 (3.75)
	Limited English Proficient	11649 (4.79)	8481 (72.80)	3168 (27.20)	4996 (42.89)	3485 (29.92)	2544 (21.84)	624 (5.36)

Table 3. Spanish TAKS Classification Accuracy for the TPM from 2009 to 2010

Grade/ Subject	Group	N (Pct. Relative to All Students)	Total Projection Accuracy (Pct. Relative to the Group)		Accurate Classifications (Pct. Relative to the Group)		Misclassifications (Pct. Relative to the Group)	
			Accurate Projections	Inaccurate Projections	MS	DNM	MS (Under Projection)	DNM (Over Projection)
			Grade 4 to Grade 5 Reading	All Students	4439 (100.00)	3622 (81.59)	817 (18.41)	3038 (68.44)
African American*	6 (0.14)	2 (33.33)		4 (66.67)	2 (33.33)	0 (0.00)	1 (16.67)	3 (50.00)
Hispanic	4427 (99.73)	3614 (81.64)		813 (18.36)	3030 (68.44)	584 (13.19)	226 (5.11)	587 (13.26)
White*	5 (0.11)	5 (100.00)		0 (0.00)	5 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)
Economically Disadvantaged	4218 (95.02)	3433 (81.39)		785 (18.61)	2883 (68.35)	550 (13.04)	215 (5.10)	570 (13.51)
Special Education	157 (3.54)	127 (80.89)		30 (19.11)	74 (47.13)	53 (33.76)	5 (3.18)	25 (15.92)
Limited English Proficient	4382 (98.72)	3574 (81.56)		808 (18.44)	2994 (68.32)	580 (13.24)	223 (5.09)	585 (13.35)
Grade 4 to Grade 5 Mathematics	All Students	2584 (100.00)	2012 (77.86)	572 (22.14)	971 (37.58)	1041 (40.29)	174 (6.73)	398 (15.40)
	African American*	1 (0.04)	1 (100.00)	0 (0.00)	0 (0.00)	1 (100.00)	0 (0.00)	0 (0.00)
	Hispanic	2578 (99.77)	2006 (77.81)	572 (22.19)	966 (37.47)	1040 (40.34)	174 (6.75)	398 (15.44)
	White*	4 (0.15)	4 (100.00)	0 (0.00)	4 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)
	Economically Disadvantaged	2455 (95.01)	1907 (77.68)	548 (22.32)	913 (37.19)	994 (40.49)	166 (6.76)	382 (15.56)
	Special Education	94 (3.64)	71 (75.53)	23 (24.47)	19 (20.21)	52 (55.32)	10 (10.64)	13 (13.83)
	Limited English Proficient	2539 (98.26)	1977 (77.87)	562 (22.13)	942 (37.10)	1035 (40.76)	168 (6.62)	394 (15.52)

Note. The results of African and White groups are not included in the “Results Summarized By Student Group” section because of the limited group sizes.