

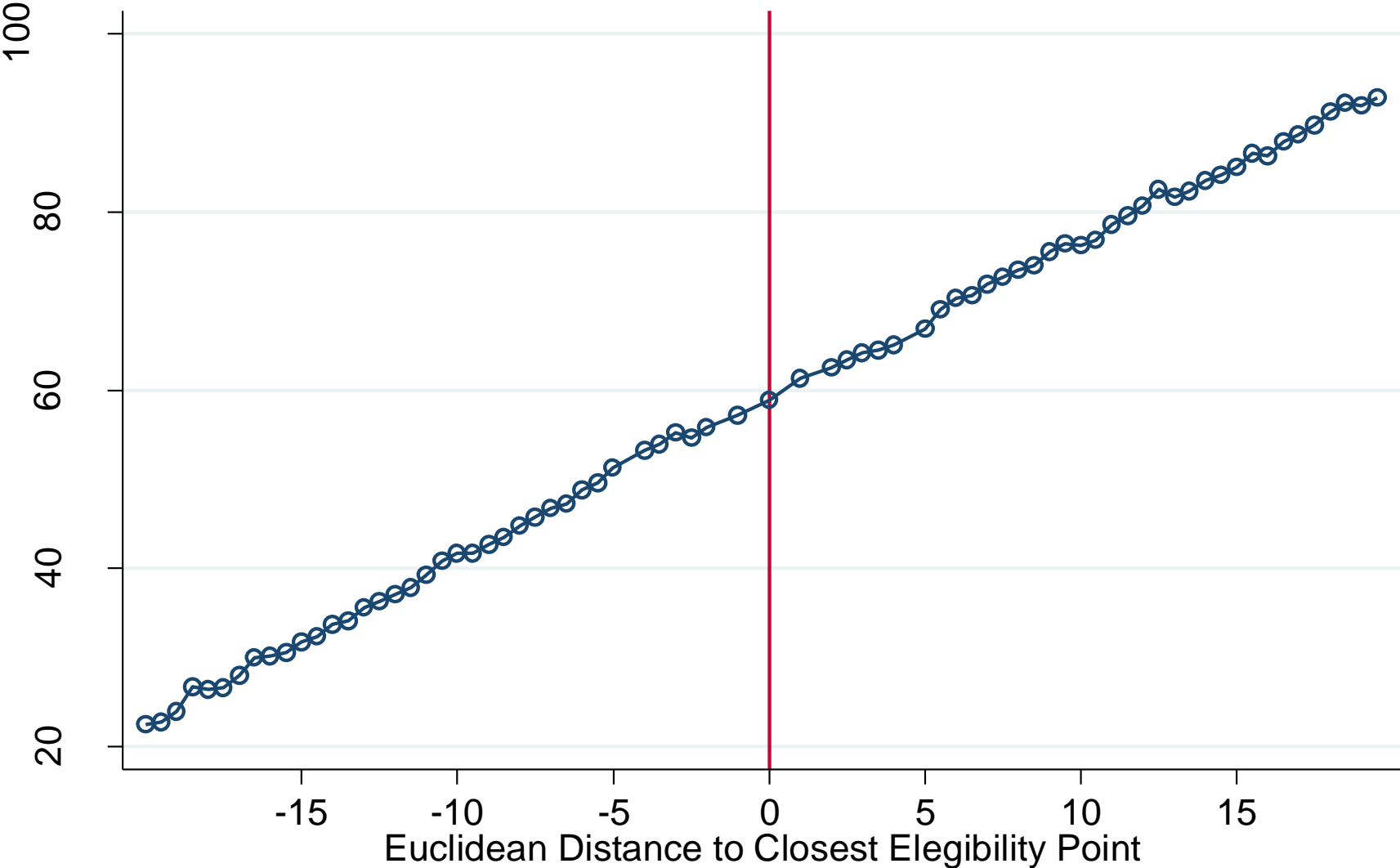
Is Gifted Education a Bright Idea?

Assessing the Impact of Gifted and Talented Programs on Students

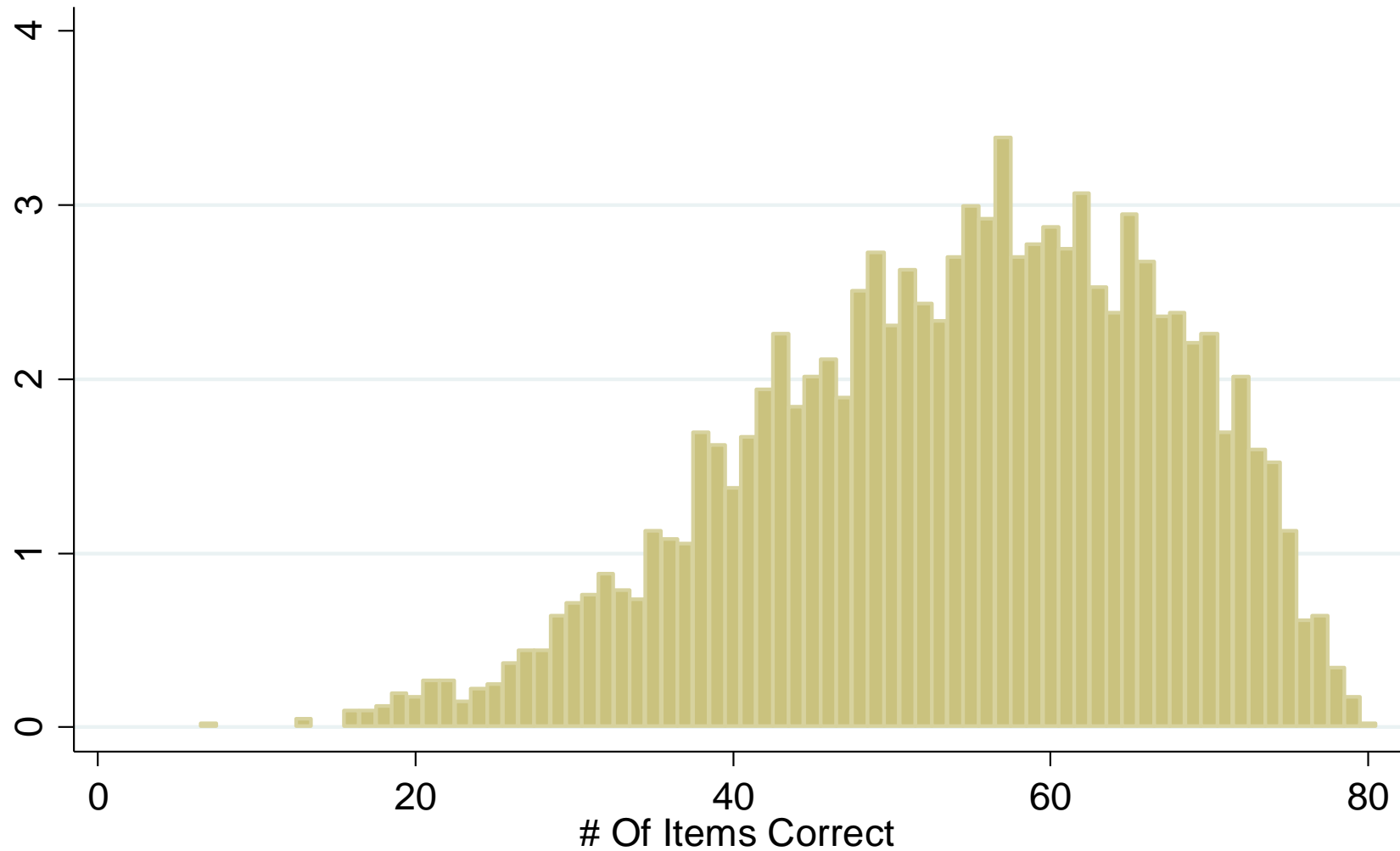
By Sa A. Bui, Steven G. Craig, and Scott A. Imberman

"Online Appendix"

Appendix Figure 1: Relationship Between Matrix Scores and Euclidean Distance

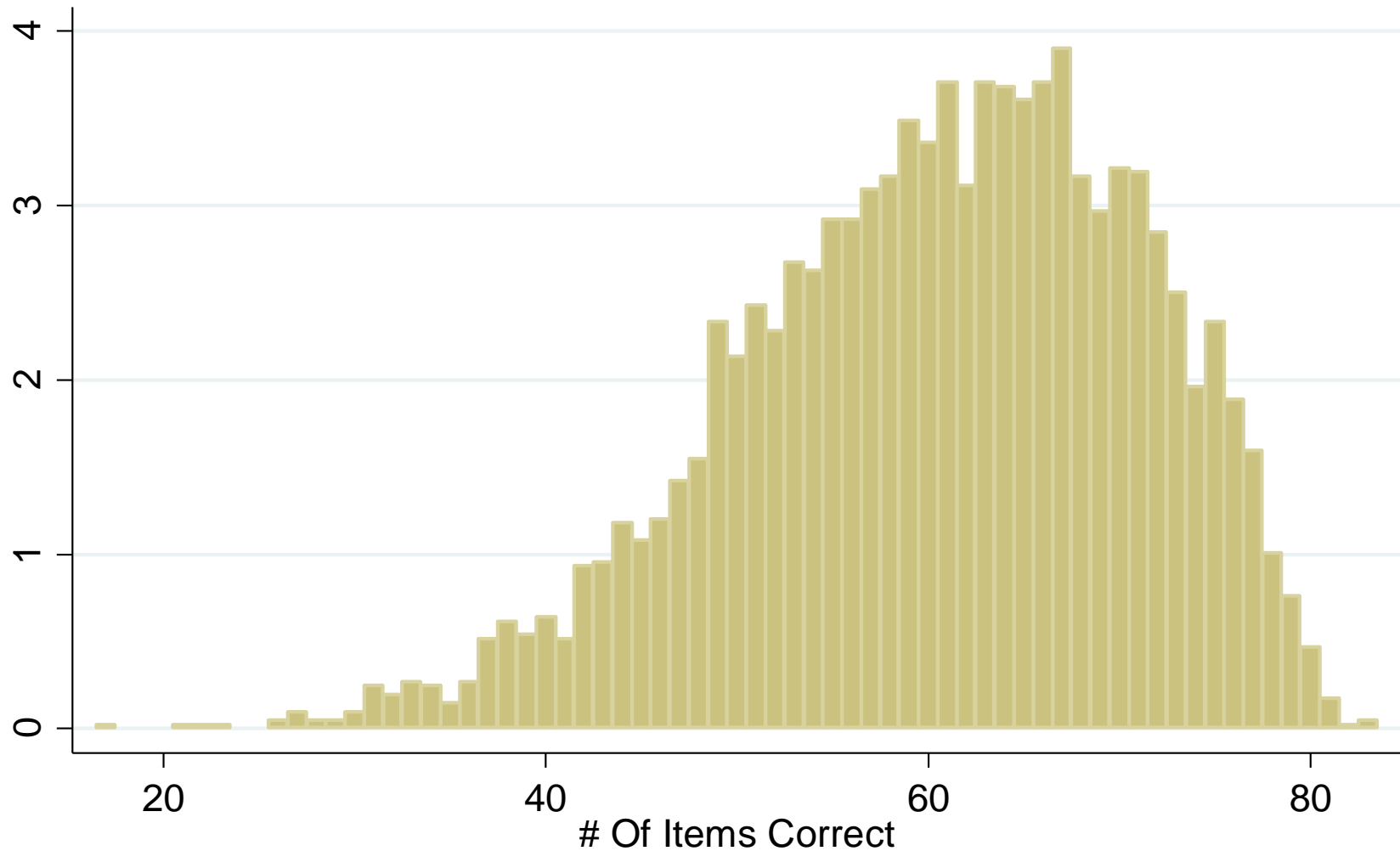


Appendix Figure 2: Distribution of Raw Math in 7th Grade For Students with Distances Between -15 and 15



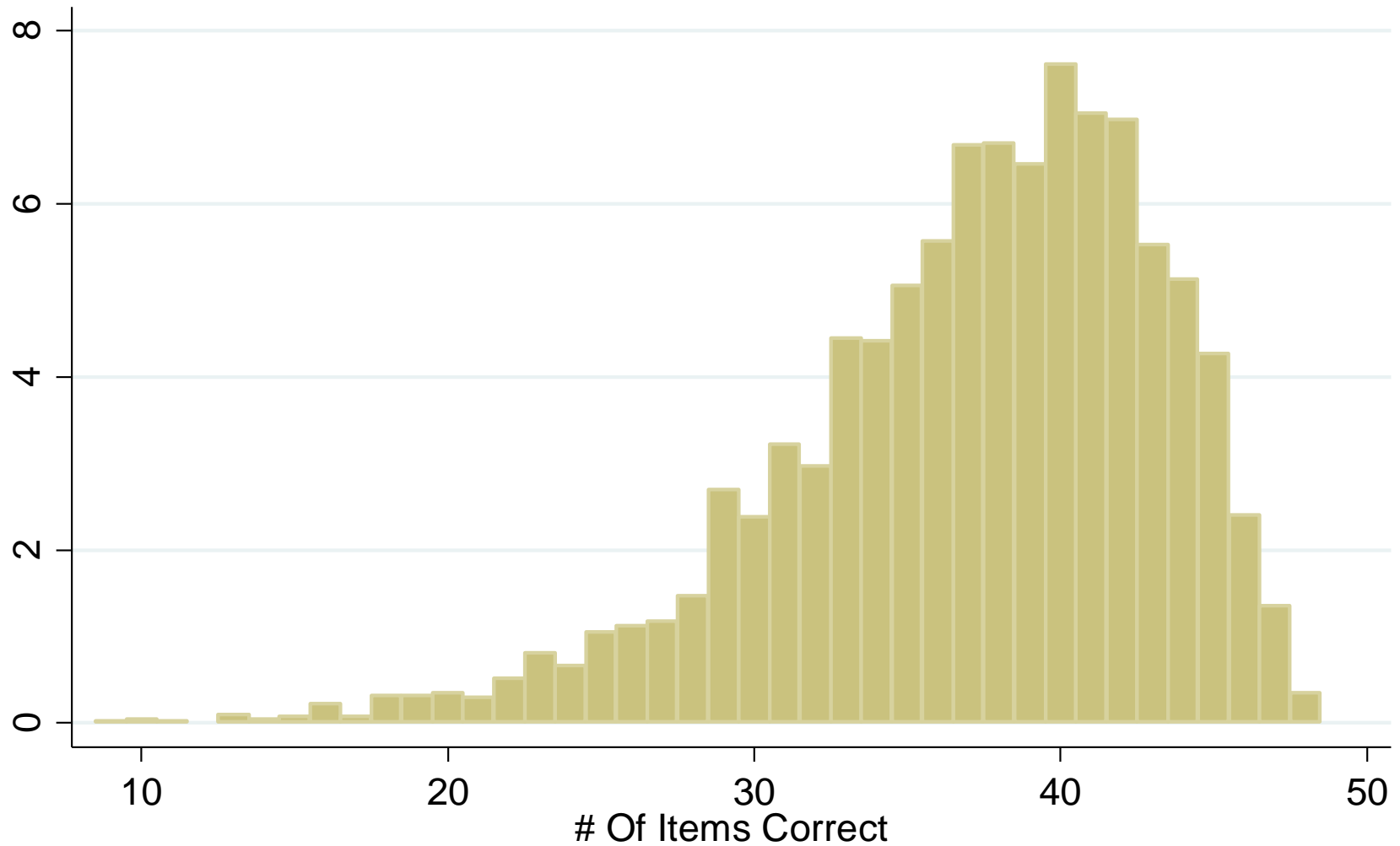
Mean = 54.2. Max = 80.

Appendix Figure 3: Distribution of Raw Reading in 7th Grade For Students with Distances Between -15 and 15



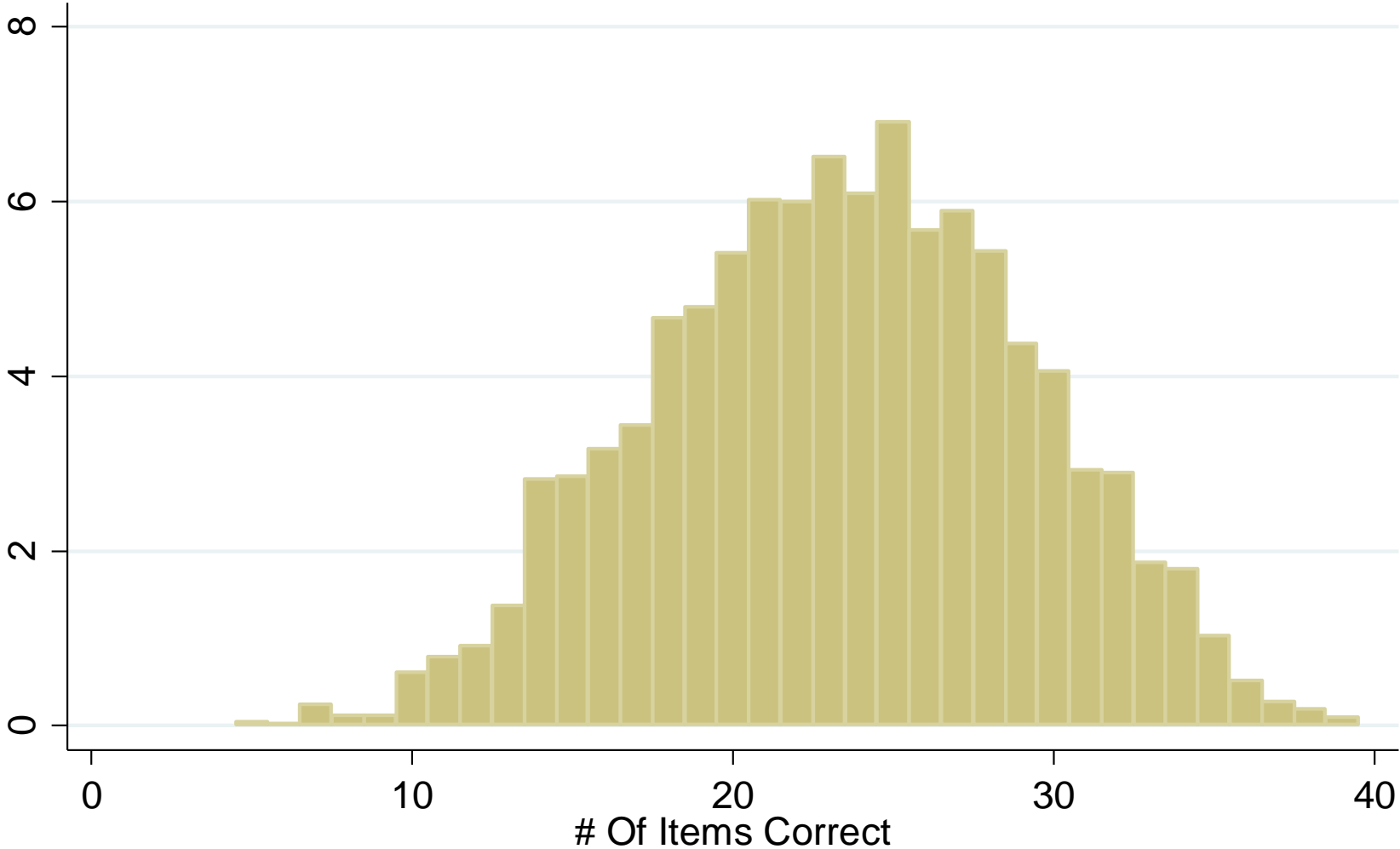
Mean = 60.6. Max = 84.

Appendix Figure 4: Distribution of Raw Language Scores in 7th Grade For Students with Distances Between -15 and 15



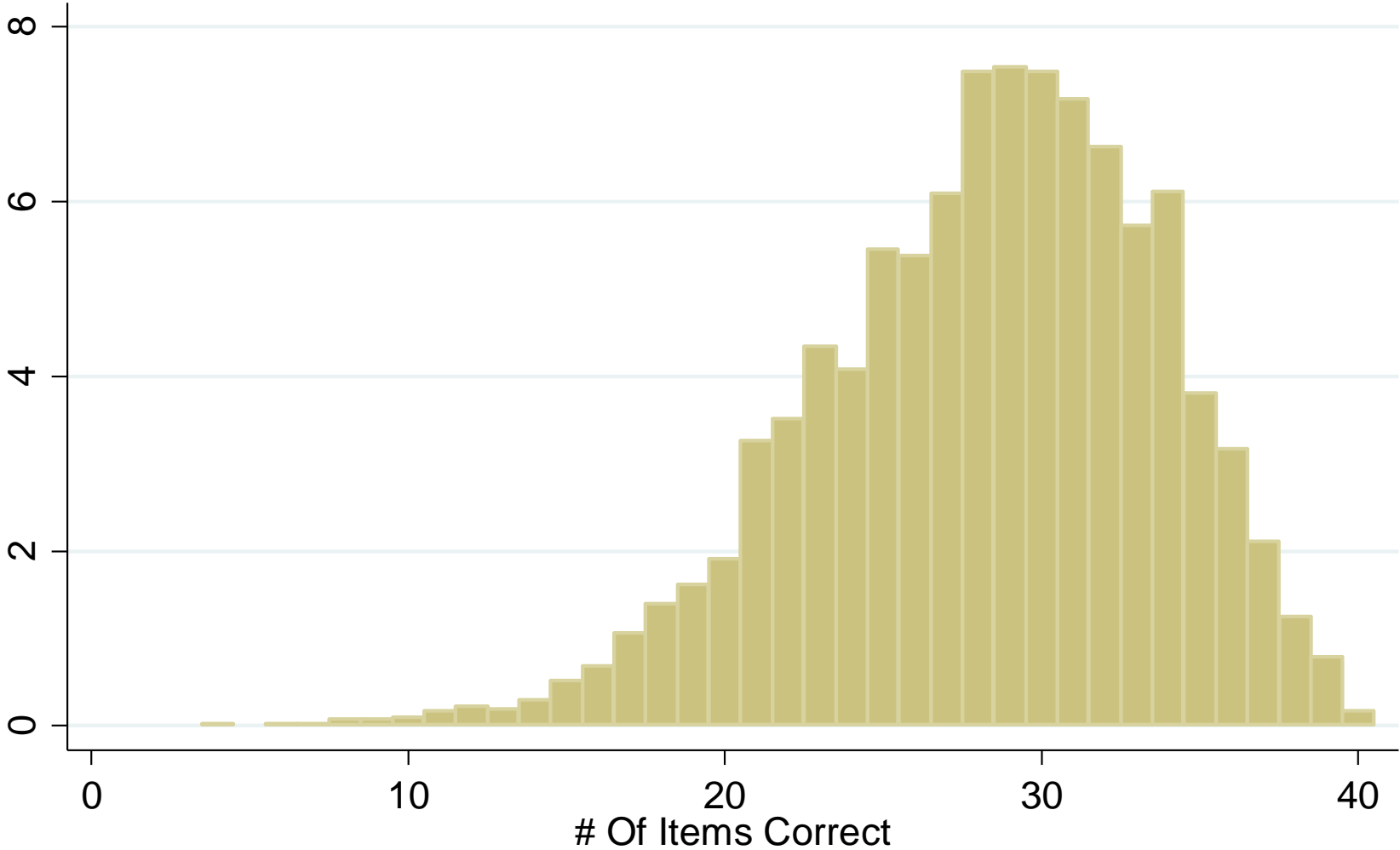
Mean = 37.1. Max = 48.

Appendix Figure 5: Distribution of Raw Soc Scores in 7th Grade For Students with Distances Between -15 and 15



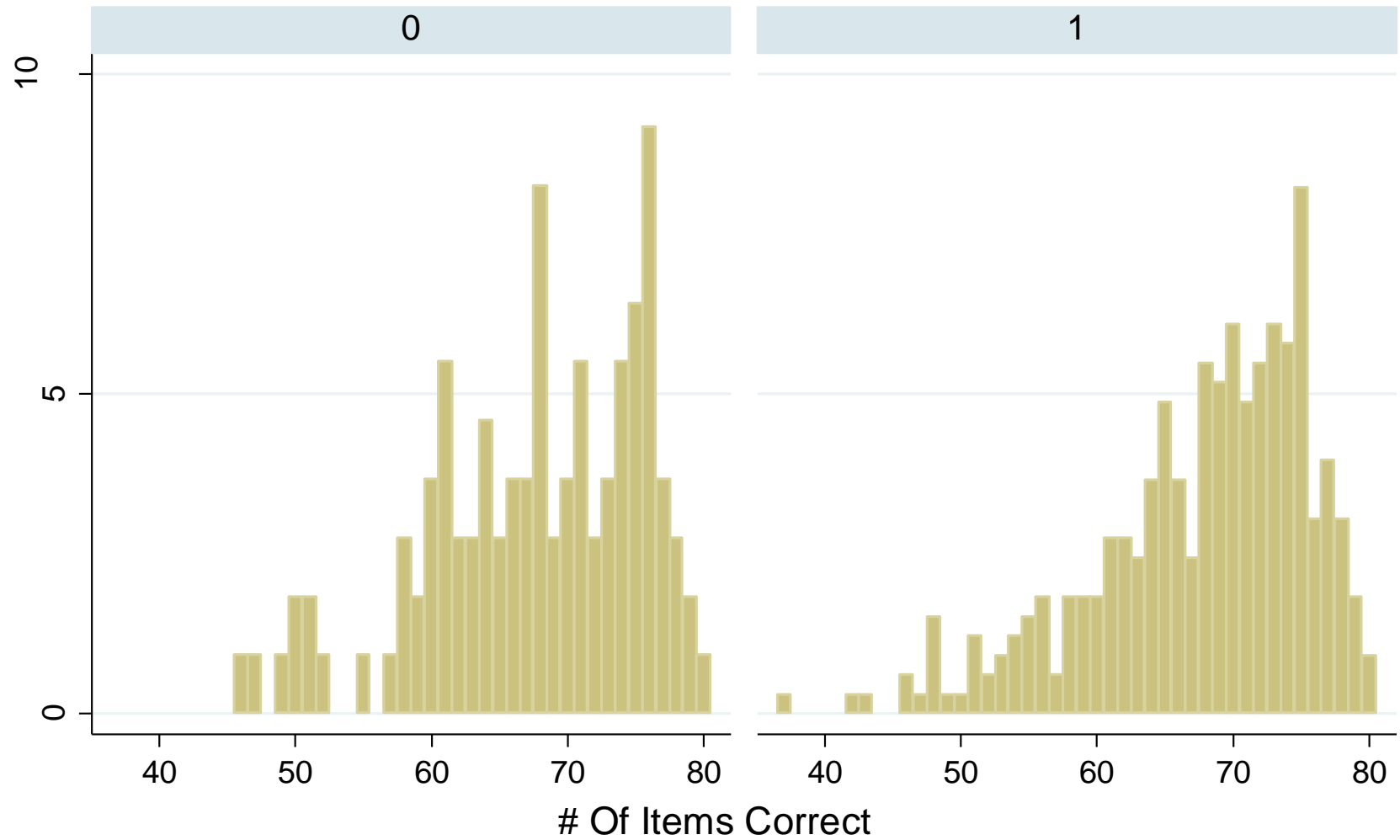
Mean = 23.4. Max = 40.

Appendix Figure 6: Distribution of Raw Sci Scores in 7th Grade For Students with Distances Between -15 and 15



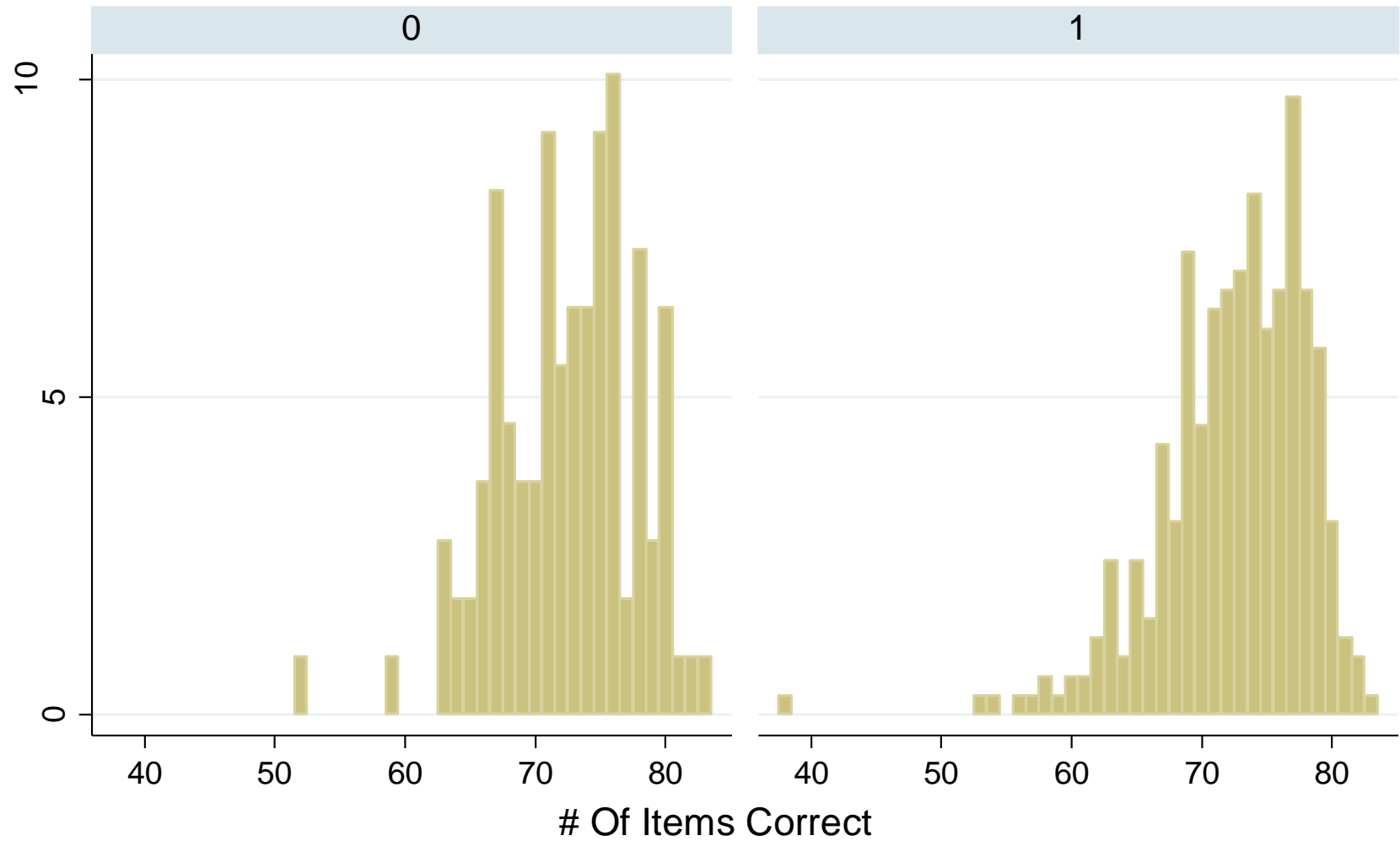
Mean = 28.2. Max = 40.

Appendix Figure 7: Distribution of Raw Math in 7th Grade By Win or Lose Lottery



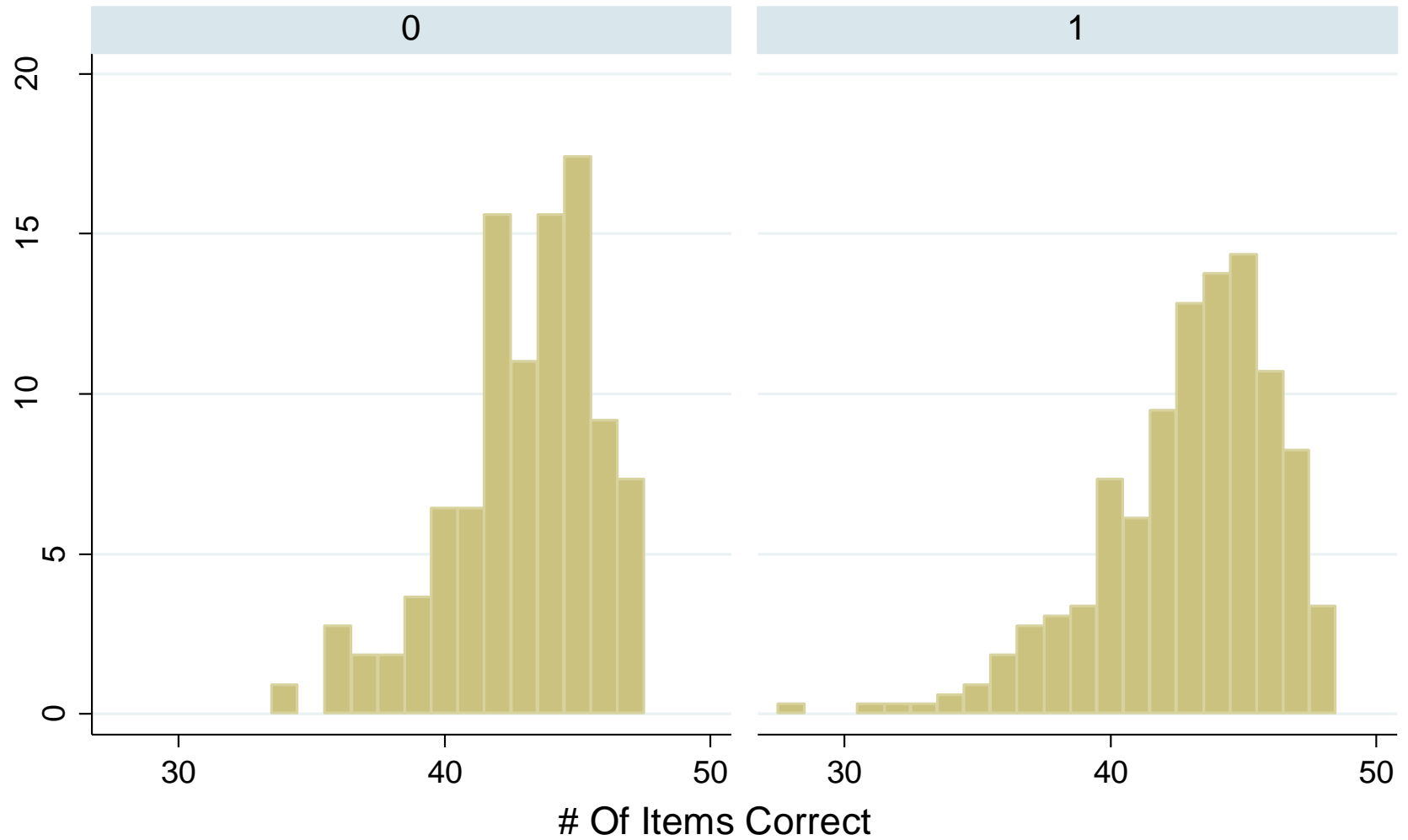
Mean = 68. Maximum = 80.

Appendix Figure 8: Distribution of Raw Reading in 7th Grade By Win or Lose Lottery



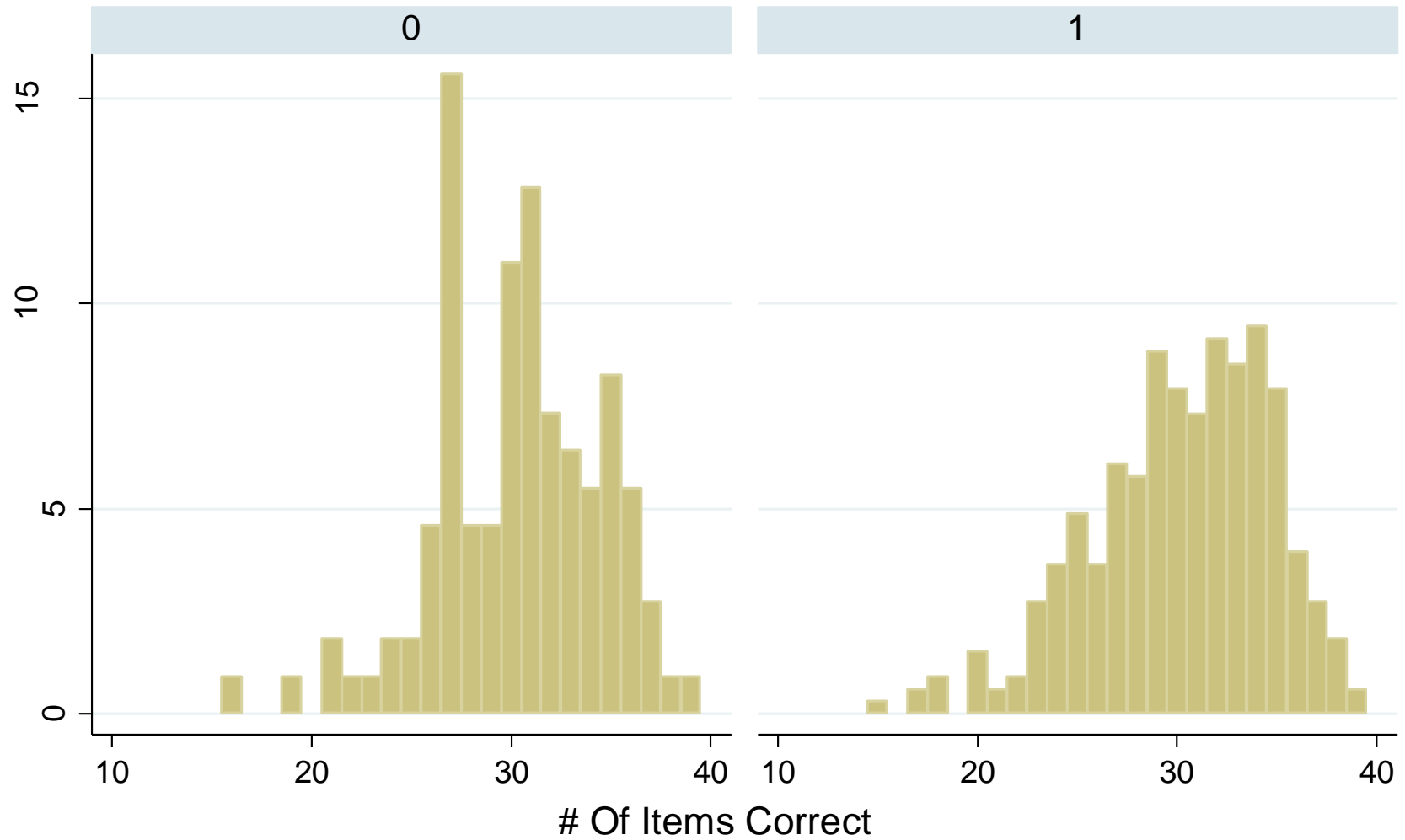
Mean = 72.5. Maximum = 84.

Appendix Figure 9: Distribution of Raw Language in 7th Grade By Win or Lose Lottery



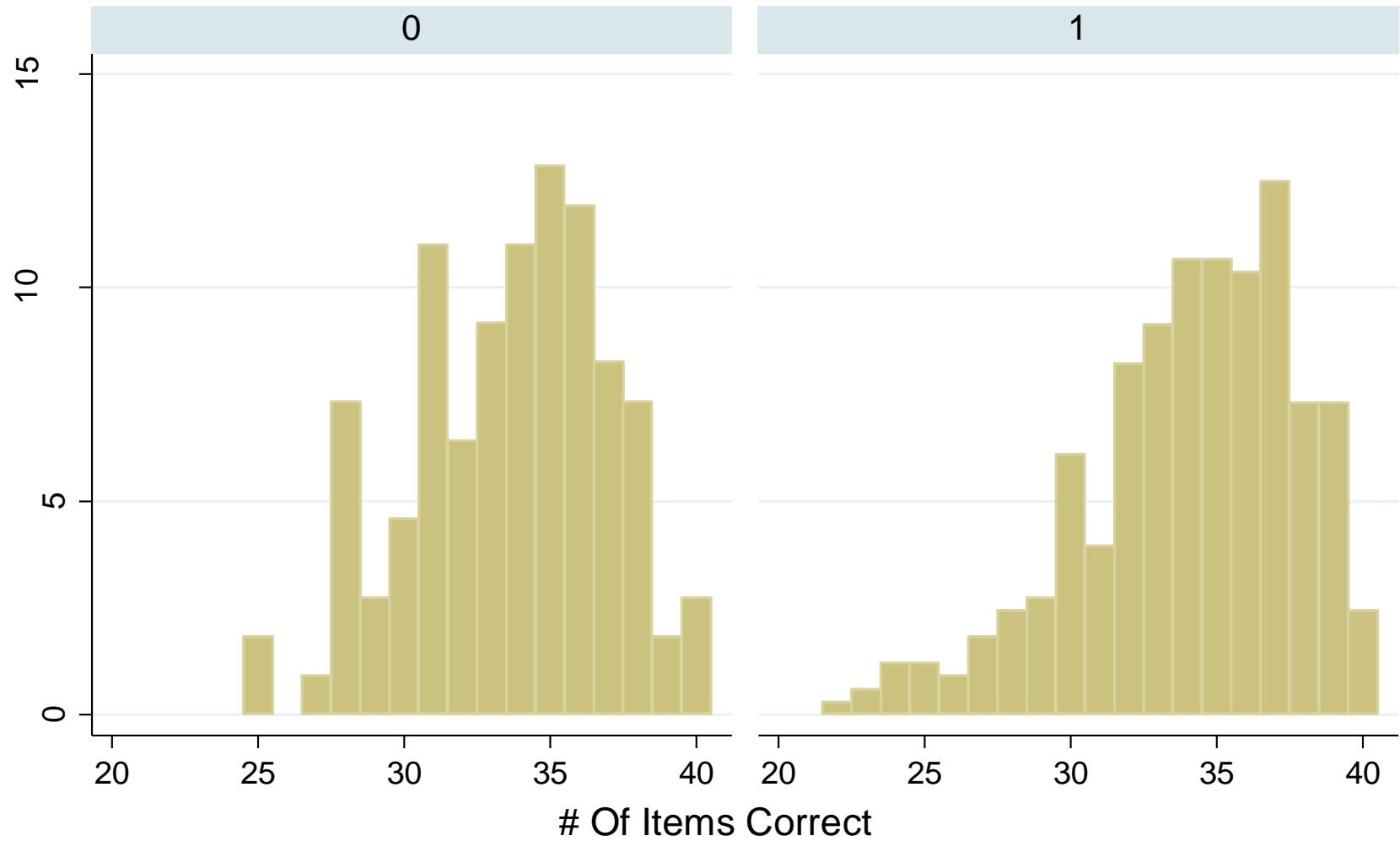
Mean = 43. Maximum = 48.

Appendix Figure 10: Distribution of Raw Soc in 7th Grade By Win or Lose Lottery



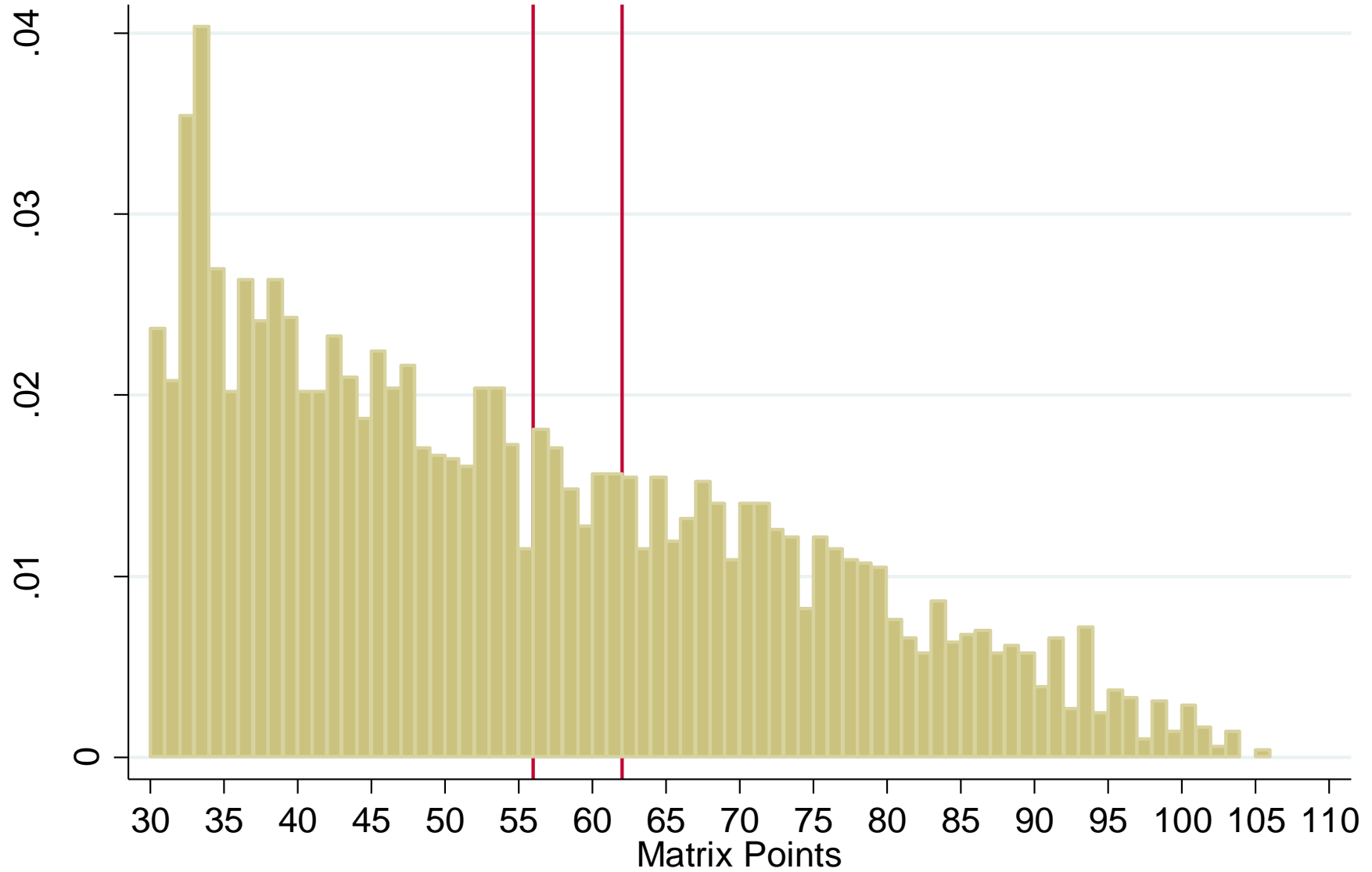
Mean = 30.2. Maximum = 40.

Appendix Figure 11: Distribution of Raw Sci in 7th Grade By Win or Lose Lottery

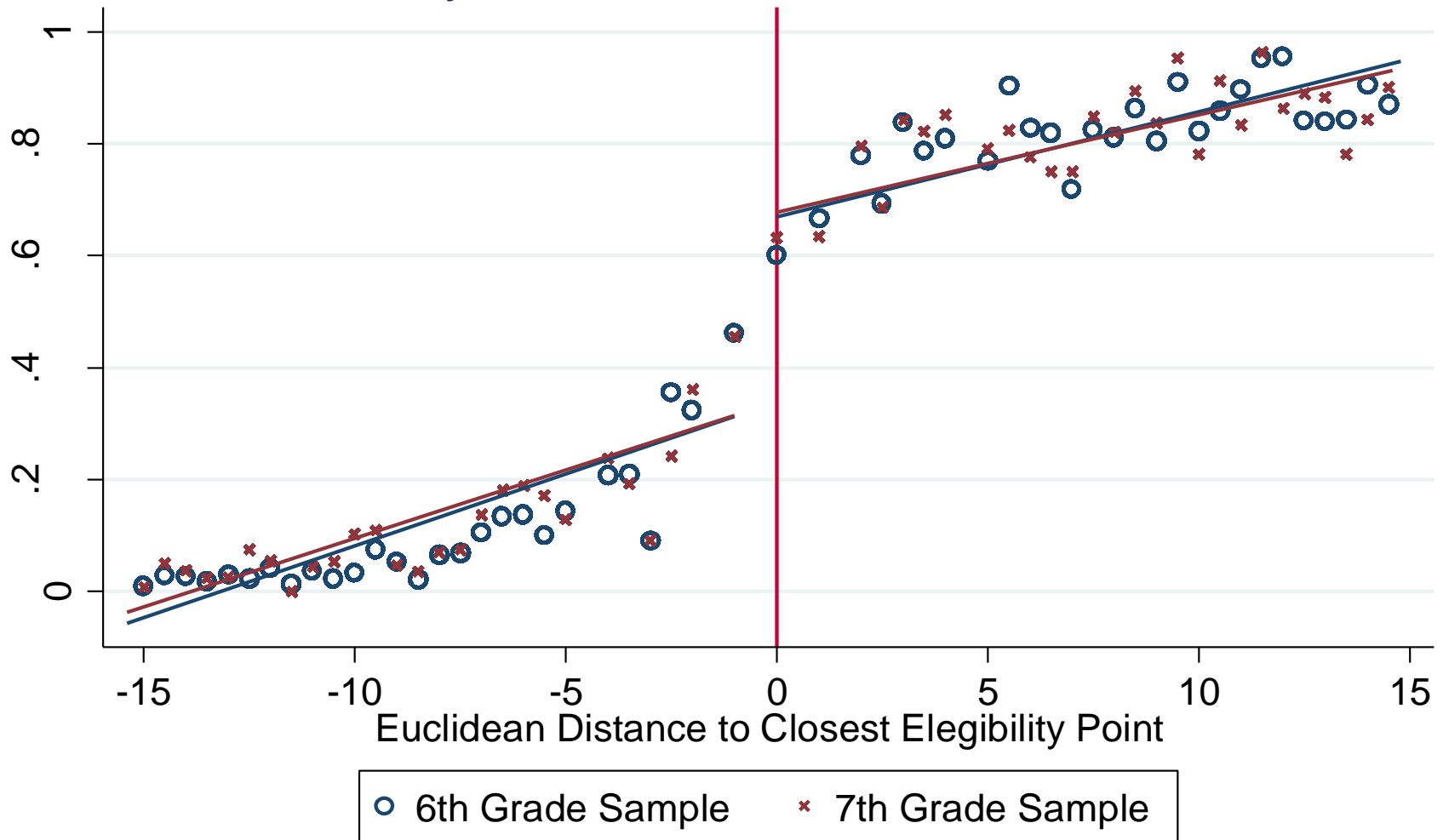


Mean = 33.9. Maximum = 40.

Appendix Figure 12: Distribution of Matrix points



Appendix Figure 13: Gifted Status by Distance to Boundary
Based on 5th Grade Matrix Points
Synthetic Teacher Scores



Appendix Table 1 - Reduced-Form Estimates of Discontinuities in Pre-Existing (5th Grade) Student Characteristics - Full 2007-08 Cohort

	Black	Hispanic	Female	LEP	Gifted in 5th Grade	Special Education	Free / Reduced-Price Lunch	Stanford - Math	Stanford - Reading
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Above GT Cutoff	0.028 (0.020)	0.010 (0.026)	0.008 (0.029)	0.025 (0.027)	0.008 (0.031)	0.015* (0.009)	0.003 (0.026)	-0.158*** (0.038)	-0.031 (0.037)
Observations	5,383	5,383	5,383	5,368	5,383	5,383	5,383	5,327	5,328
	Stanford - Language	Stanford - Social Studies	Stanford - Science	# of Disciplinary Infractions	Attendance Rate (%)	Any Missing Matrix Data	Teacher Score	Teacher Points	
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
Above GT Cutoff	-0.045 (0.042)	-0.042 (0.039)	-0.017 (0.039)	0.023 (0.020)	-0.307** (0.141)	0.010 (0.007)	1.915 (1.696)	0.349 (0.214)	
Observations	5,323	5,325	5,324	5,383	5,383	5,383	5,348	5,348	
Observations	6,849	6,849	6,849	6,842	6,849	6,849	6,849	6,773	

Achievement measured in standard deviations of scale scores within grade and year. Disciplinary infractions is the number of infractions warranting a suspension or more severe punishment per year. Includes a linear smoother with a slope shift above the cutoff. Sample is limited to students with Euclidean distances from qualifying via the GT qualification matrix of between -15 and 15, but includes all students tested irrespective of 7th grade enrollment in LUSD. Standard errors are robust to heteroskedasticity and clustered by 5th grade school.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Appendix Table 2 - 2SLS Estimates of Impacts of G&T Services on Peer Achievement
Synthetic Classrooms Within Teacher-Course Identifier-Grade Cell

	Peer Math Scores in Math Classes (1)	Peer Reading Scores in Read/Eng Classes (2)	Peer Language Scores in Read/Eng Classes (3)	Peer Soc Scores in Soc Classes (4)	Peer Science Scores in Science Classes (5)
A. Two Years After Evaluation (7th Grade)					
(i) Students Sorted by 5th Grade Achievement	0.039 (0.091)	0.193*** (0.065)	0.173** (0.067)	0.231*** (0.078)	0.196** (0.089)
Observations	4,049	4,001	4,001	3,974	3,947
(ii) Students Sorted Randomly	0.292** (0.121)	0.258** (0.113)	0.244** (0.106)	0.315*** (0.115)	0.306*** (0.104)
Observations	4,057	4,006	4,006	3,981	3,953
B. One Year After Evaluation (6th Grade)					
(i) Students Sorted by 5th Grade Achievement	0.262*** (0.088)	0.202*** (0.062)	0.215*** (0.060)	0.274*** (0.098)	0.266*** (0.091)
Observations	8,509	8,577	8,577	8,379	8,336
(ii) Students Sorted Randomly	0.481*** (0.148)	0.345*** (0.107)	0.316*** (0.097)	0.424*** (0.139)	0.404*** (0.123)
Observations	8,514	8,581	8,581	8,386	8,340

Model (i) sorts students in teacher-grade-course cells by their 5th grade achievement in that subject into synthetic classes of at most 35 students. Model (ii) randomizes students across the synthetic classes. If there are not enough students to fill a 35 student class then the students are distributed evenly across the classes. Achievement measured in standard deviations of scale scores within grade and year. Controls for race, gender, economic disadvantage, LEP, prior gifted status and lagged (5th grade) dependent variable included in panel B. Both panels include a linear smoother with a slope shift above the cutoff. Sample is limited to students with Euclidean distances from qualifying via the GT qualification matrix of between -15 and 15. Standard errors are robust to heteroskedasticity and clustered by 7th grade school.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Appendix Table 3 - Regression Discontinuity Estimates of Impact of Receiving G&T Services on Students Exiting 5th Grade

Model	Dependent Variable	Stanford Achievement Test				
		Math (1)	Reading (2)	Language (3)	Social Studies (4)	Science (5)
A. Control for Lagged (5th Grade) Dependent Variable and Smoother Only						
Reduced Form	Above GT Cutoff	-0.016 (0.040)	0.018 (0.036)	-0.008 (0.038)	-0.010 (0.043)	-0.027 (0.041)
2SLS - 1st Stage	Above GT Cutoff	0.512*** (0.051)	0.502*** (0.052)	0.504*** (0.052)	0.502*** (0.052)	0.499*** (0.053)
2SLS - 2nd Stage	Enrolled in GT	-0.032 (0.078)	0.035 (0.072)	-0.016 (0.075)	-0.020 (0.085)	-0.055 (0.083)
	Observations	4,023	4,025	4,020	4,022	4,018
2SLS - 2nd Stage	Enrolled in GT	(0.058)	(0.051)	(0.055)	(0.071)	(0.064)
B. Include Middle School Fixed Effects						
Reduced Form	Above GT Cutoff	-0.025 (0.033)	0.018 (0.034)	-0.002 (0.032)	0.000 (0.045)	-0.011 (0.042)
2SLS - 1st Stage	Above GT Cutoff	0.514*** (0.052)	0.509*** (0.052)	0.509*** (0.053)	0.509*** (0.052)	0.507*** (0.053)
2SLS - 2nd Stage	Enrolled in GT	-0.049 (0.064)	0.036 (0.068)	-0.004 (0.063)	0.001 (0.089)	-0.022 (0.083)
	Observations	4,023	4,025	4,020	4,022	4,018

Achievement measured in standard deviations of scale scores within grade and year. Disciplinary infractions is the number of infractions warranting a suspension or more severe punishment per year. Controls for race, gender, economic disadvantage, LEP, prior gifted status and lagged (5th grade) dependent variable included in panel B. Both panels include a linear smoother with a slope shift above the cutoff. Sample is limited to students with Euclidean distances from qualifying via the GT qualification matrix of between -15 and 15. Standard errors are robust to heteroskedasticity and clustered by school during outcome year.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Appendix Table 4 - Regression Discontinuity Estimates of Impact of Receiving G&T Services
 Samples Split by Estimated Impact of Cutoff on Mechanism for Student's Zoned School

Model	Dependent Variable	Independent Variable	Subject									
			Math		Reading		Language		Social Studies		Science	
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A. School's RD Impact on Peer Achievement in Teacher-Course-Grade-Year Cell												
			> 0.2 SD	<= 0.2 SD	> 0.2 SD	<= 0.2 SD	> 0.2 SD	<= 0.2 SD	> 0.2 SD	<= 0.2 SD	> 0.2 SD	<= 0.2 SD
2SLS - 1st Stage	Enrolled in GT	Above GT Cutoff	0.663*** (0.051)	0.407*** (0.070)	0.576*** (0.056)	0.439*** (0.073)	0.561*** (0.071)	0.481*** (0.063)	0.556*** (0.070)	0.482*** (0.067)	0.552*** (0.071)	0.483*** (0.067)
2SLS - 2nd Stage Mechanism	Mean Peer Achievement	Enrolled in GT	0.477*** (0.129)	0.168 (0.142)	0.547*** (0.150)	0.079 (0.157)	0.585*** (0.131)	0.120 (0.125)	0.489*** (0.133)	0.145 (0.115)	0.471*** (0.120)	0.155 (0.120)
2SLS - 2nd Stage Achievement	Own Achievement	Enrolled in GT	-0.072 (0.083)	-0.057 (0.144)	0.039 (0.071)	0.041 (0.123)	-0.052 (0.087)	-0.008 (0.125)	-0.118 (0.115)	0.078 (0.123)	-0.030 (0.104)	-0.003 (0.112)
	Observations		1,643	2,079	1,514	1,958	1,551	1,917	1,554	2,037	1,552	2,035
B. School's RD Impact on Vanguard Class Enrollment												
			> 0.2	<= 0.2	> 0.2	<= 0.2	> 0.2	<= 0.2	> 0.2	<= 0.2	> 0.2	<= 0.2
2SLS - 1st Stage	Enrolled in GT	Above GT Cutoff	0.694*** (0.051)	0.361*** (0.068)	0.697*** (0.054)	0.382*** (0.068)	0.695*** (0.056)	0.386*** (0.068)	0.704*** (0.052)	0.353*** (0.069)	0.704*** (0.052)	0.350*** (0.070)
2SLS - 2nd Stage Mechanism	Vanguard Class Enrollment	Enrolled in GT	0.506*** (0.147)	-0.044 (0.160)	0.550*** (0.155)	-0.031 (0.154)	0.554*** (0.150)	-0.014 (0.151)	0.513*** (0.150)	-0.072 (0.177)	0.521*** (0.147)	-0.082 (0.179)
2SLS - 2nd Stage Achievement	Own Achievement	Enrolled in GT	-0.064 (0.075)	-0.084 (0.137)	0.087* (0.051)	-0.054 (0.141)	-0.007 (0.084)	-0.055 (0.143)	-0.143 (0.089)	0.187 (0.178)	-0.047 (0.074)	0.041 (0.234)
	Observations		1,773	1,949	1,466	2,009	1,463	2,008	1,687	1,932	1,685	1,930
C. School's RD Impact on Gifted Share in Teacher-Course-Grade-Year Cell												
			> 10%	<= 10%	> 10%	<= 10%	> 10%	<= 10%	> 10%	<= 10%	> 10%	<= 10%
2SLS - 1st Stage	Enrolled in GT	Above GT Cutoff	0.684*** (0.045)	0.407*** (0.072)	0.685*** (0.046)	0.339*** (0.074)	0.682*** (0.048)	0.346*** (0.074)	0.701*** (0.050)	0.371*** (0.069)	0.699*** (0.050)	0.370*** (0.070)
2SLS - 2nd Stage Mechanism	Gifted Share of Cell	Enrolled in GT	0.274*** (0.059)	0.095* (0.056)	0.263*** (0.068)	0.046 (0.087)	0.258*** (0.066)	0.070 (0.087)	0.248*** (0.063)	0.050 (0.064)	0.250*** (0.062)	0.049 (0.065)
2SLS - 2nd Stage Achievement	Own Achievement	Enrolled in GT	-0.027 (0.080)	-0.096 (0.119)	0.114** (0.053)	-0.147 (0.162)	-0.061 (0.082)	0.020 (0.179)	-0.045 (0.104)	0.038 (0.145)	-0.109 (0.088)	0.148 (0.210)
	Observations		1,471	2,251	1,763	1,709	1,762	1,706	1,597	2,022	1,595	2,020

Achievement is measured in standard deviations of scale scores within grade and year. Controls for race, gender, economic disadvantage, LEP, prior gifted status and lagged (5th grade) dependent variable are included. The sample is split based on schools with 30 or more students, based on the estimated treatment in each school. All panels include a linear smoother with a slope shift above the cutoff. Sample is limited to students with Euclidean distances from qualifying via the GT qualification matrix of between -15 and 15. Standard errors are robust to heteroskedasticity and clustered by 7th grade school.

*** Significant at the 1 percent level.
 ** Significant at the 5 percent level.
 * Significant at the 10 percent level.

Appendix Table 5 - 2SLS Estimates of Impact of Receiving G&T Services
Estimates for Sub-Populations

	Stanford Achievement Test					
	First Stage	Math	Reading	Language	Social Studies	Science
	(1)	(2)	(3)	(4)	(5)	(6)
(1) Females	0.578*** (0.053)	-0.031 (0.087)	0.026 (0.072)	-0.041 (0.070)	-0.100 (0.079)	-0.024 (0.097)
Observations	2,936	2,936	2,933	2,931	2,927	2,925
(2) Males	0.503*** (0.056)	-0.105 (0.096)	0.087 (0.088)	0.052 (0.081)	0.023 (0.104)	0.026 (0.093)
Observations	2,698	2,698	2,703	2,696	2,696	2,692
(3) Free/Reduced-Price Lunch	0.563*** (0.048)	0.005 (0.070)	0.053 (0.069)	0.005 (0.072)	-0.019 (0.075)	-0.003 (0.071)
Observations	3,638	3,638	3,639	3,637	3,634	3,631
(4) No Free/Reduced-Price Lunch	0.491*** (0.072)	-0.195* (0.112)	0.030 (0.087)	-0.027 (0.105)	-0.071 (0.127)	-0.005 (0.109)
Observations	1,996	1,996	1,997	1,990	1,989	1,986
(5) Black	0.620*** (0.091)	-0.071 (0.128)	0.133 (0.107)	-0.072 (0.120)	0.180 (0.122)	0.053 (0.125)
Observations	1,045	1,045	1,045	1,040	1,039	1,039
(6) Hispanic	0.531*** (0.046)	-0.071 (0.069)	0.050 (0.069)	-0.004 (0.080)	-0.043 (0.080)	-0.022 (0.073)
Observations	3,751	3,751	3,753	3,750	3,749	3,744
(7) White	0.428*** (0.143)	0.055 (0.234)	0.030 (0.143)	0.307 (0.372)	-0.238 (0.212)	0.147 (0.155)
Observations	573	573	573	573	570	569
(8) Gifted in 5th Grade	0.434*** (0.069)	-0.220** (0.100)	0.034 (0.122)	0.036 (0.121)	-0.132 (0.127)	0.021 (0.102)
Observations	1,642	1,642	1,644	1,642	1,641	1,641
(9) Not Gifted in 5th Grade	0.602*** (0.056)	-0.003 (0.064)	0.081 (0.071)	-0.029 (0.065)	0.019 (0.084)	0.000 (0.085)
Observations	3,992	3,992	3,992	3,985	3,982	3,976

Achievement is measured in standard deviations of scale scores within grade and year. Disciplinary infractions are the number of infractions warranting a suspension or more severe punishment per year. Controls for race, gender, economic disadvantage and lagged (5th grade) dependent variable included, along with a linear smoother with a slope shift above the cutoff included. Standard errors are robust to heteroskedasticity and clustered by 7th grade school. Sample is limited to students with Euclidean distances from qualifying via the GT qualification matrix of between -20 and 20.

Appendix Table 6- Probit of Attrition by 7th Grade in Lottery Sample
Coefficients Are Marginal Effects at Sample Means

Asian	-0.101** (0.046)	Stanford Reading	-0.048 (0.031)
Hispanic	-0.085* (0.046)	Stanford Language	0.027 (0.021)
White	-0.072 (0.050)	Stanford Social Science	0.025 (0.023)
Disadvantaged	-0.076* (0.046)	Stanford Science	0.005 (0.020)
Female	0.046 (0.041)	Attendance Rate	-0.024*** (0.009)
Special Education	0.161 (0.158)	Infractions	-0.085 (0.136)
LEP	0.118 (0.180)	Matrix Points	0.000 (0.002)
At Risk	0.079 (0.140)	Final Grade	0.005 (0.007)
Gifted	-0.044 (0.054)	Naglieri Score	0.003 (0.003)
In GT Magnet	-0.015 (0.054)	Teacher Score	-0.000 (0.001)
Stanford Math	0.022 (0.033)		
Observations		479	

Achievement measured in standard deviations of scale scores within grade and year. Standard errors clustered by 5th grade school in parentheses.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Appendix Table 7 - 2SLS Estimates of the Effect of Attending a GT Magnet School Relative to a GT Neighborhood Program, Subpopulations Weighted with Controls

Subpopulation	Stanford Achievement Test				
	Math (1)	Reading (2)	Language (3)	Social Studies (4)	Science (5)
Female	-0.171 (0.154)	0.023 (0.269)	-0.186 (0.151)	0.033 (0.100)	0.183 (0.138)
<i>Observations</i>	229	229	229	229	229
Male	-0.007 (0.175)	0.025 (0.156)	0.237 (0.248)	0.044 (0.172)	0.258 (0.208)
<i>Observations</i>	207	208	206	207	207
White	-0.182 (0.123)	-0.171 (0.128)	0.296* (0.152)	-0.013 (0.205)	0.347* (0.159)
<i>Observations</i>	172	172	172	172	172
Minority	-0.032 (0.192)	0.103 (0.165)	-0.131 (0.163)	0.067 (0.095)	0.200 (0.155)
<i>Observations</i>	264	265	263	264	264
Minority - Excluding Asians	0.063 (0.220)	0.356 (0.210)	-0.327 (0.238)	0.072 (0.136)	-0.001 (0.116)
<i>Observations</i>	158	159	157	158	158
Not Economically Disadvantaged	-0.152 (0.166)	-0.053 (0.137)	0.320** (0.119)	-0.034 (0.189)	0.291 (0.186)
<i>Observations</i>	307	308	307	307	307
Economically Disadvantaged	-0.041 (0.217)	0.124 (0.233)	-0.230 (0.178)	0.065 (0.093)	0.245 (0.183)
<i>Observations</i>	129	129	128	129	129
Below Median Achievement of Lottery Participants	0.026 (0.249)	-0.217 (0.279)	-0.169 (0.205)	-0.123 (0.155)	0.237*** (0.056)
<i>Observations</i>	208	200	177	222	205
Above Median Achievement of Lottery Participants	-0.049 (0.135)	0.062 (0.178)	0.290* (0.151)	-0.025 (0.194)	0.340 (0.240)
<i>Observations</i>	228	237	258	215	231
Below 25th Percentile of Achievement for Lottery Participants	-0.042 (0.200)	-0.533** (0.209)	0.085 (0.163)	-0.010 (0.207)	0.010 (0.151)
<i>Observations</i>	97	112	93	98	88
Above 75th Percentile of Achievement for Lottery Participants	-0.204 (0.176)	0.306 (0.358)	0.477 (0.282)	0.183 (0.341)	0.614 (0.436)
<i>Observations</i>	111	135	141	111	89

Achievement measured in standard deviations of scale scores within grade and year. Achievement percentiles are for fully baseline lottery sample using 5th grade achievement in same subject. Lotteries for two schools were conducted in 2007-08 hence all regressions include indicators for lottery fixed effects. Coefficients are for an indicator for whether the student is enrolled in a GT magnet program in 7th grade. Robust standard errors clustered by 7th grade school in parentheses. Results without clustering are similar and provided in the online appendix. Regressions are weighted by the inverse of the estimated probability of remaining in the data. See text for details. Controls include indicators during 5th grade for race, gender, special education, LEP, at-risk status, gifted, whether the student was enrolled in a GT magnet, and a lagged dependent variable.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Appendix Table 8 - Reduced Form Estimates of Effect of Attending a GT Magnet School Relative to a GT Neighborhood Program, 7th Grade Sample

Model	Stanford Achievement Test				
	Math (1)	Reading (2)	Language (3)	Social Studies (4)	Science (5)
RF - Unweighted, Controls	-0.055 (0.066)	-0.032 (0.059)	0.079 (0.047)	-0.018 (0.054)	0.115 (0.072)
Observations	437	438	435	437	436
RF- Weighted, Controls	-0.121 (0.100)	-0.010 (0.093)	0.001 (0.062)	-0.019 (0.074)	0.151** (0.071)
Observations	436	437	435	436	436

Lotteries for two schools were conducted in 2007-08 hence all regressions include indicators for lottery fixed effects. Coefficients are for an indicator for whether the student is enrolled in a GT magnet program in 7th grade. Robust standard errors clustered by 6th grade school in parentheses. Results without clustering are similar and provided in the online appendix. Weighted regressions are weighted by the inverse of the estimated probability of remaining in the data. See text for details. Controls include indicators during 5th grade for race, gender, special education, at-risk status, gifted, whether the student was enrolled in a GT magnet, and a lagged dependent variable.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Appendix Table 9- Specification Tests for Lottery Analysis - 7th Grade

Outcome →	Stanford Achievement Test					
	Math	Reading	Language	Social Studies	Science	Attendance
	(1)	(2)	(3)	(4)	(5)	(6)
A. Non-Lottery Magnets in Comparison Group						
i. Unweighted						
GT Magnet	-0.093 (0.105)	-0.054 (0.097)	0.131 (0.077)	-0.030 (0.091)	0.193 (0.114)	-0.393 (0.381)
<i>Observations</i>	437	438	435	437	436	440
<i>Observations</i>	904	904	904	903	903	910
ii. Weighted						
GT Magnet	-0.065 (0.133)	0.027 (0.116)	-0.006 (0.102)	0.033 (0.082)	0.192 (0.112)	0.404 (1.291)
<i>Observations</i>	436	437	435	436	436	439
B. Count Waitlisted with Offer as Non-Winners						
i. Unweighted						
GT Magnet	-0.040 (0.197)	-0.078 (0.103)	0.283* (0.156)	0.033 (0.114)	0.035 (0.189)	0.309 (0.420)
<i>Observations</i>	428	429	426	428	427	431
ii. Weighted						
GT Magnet	-0.102 (0.111)	-0.015 (0.115)	0.219 (0.249)	0.126 (0.115)	0.122 (0.215)	0.652 (1.148)
<i>Observations</i>	427	428	426	427	427	430

Achievement measured in standard deviations of scale scores within grade and year. Lotteries for two schools were conducted in 2007-08 and 2008-09, hence all regressions include indicators for lottery fixed effects. Coefficients are for an indicator for whether the student is enrolled in a GT magnet program in 6th grade or 7th grade. Robust standard errors clustered by 6th grade school (for 6th grade regressions) or 7th grade school (for 7th grade regressions) in parentheses. Weighted regressions are weighted by the inverse of the estimated probability of remaining in the data. See text for details. Controls include indicators during 5th grade for race, gender, special education, LEP, at-risk status, gifted, whether the student was enrolled in a GT magnet, and a lagged dependent variable.