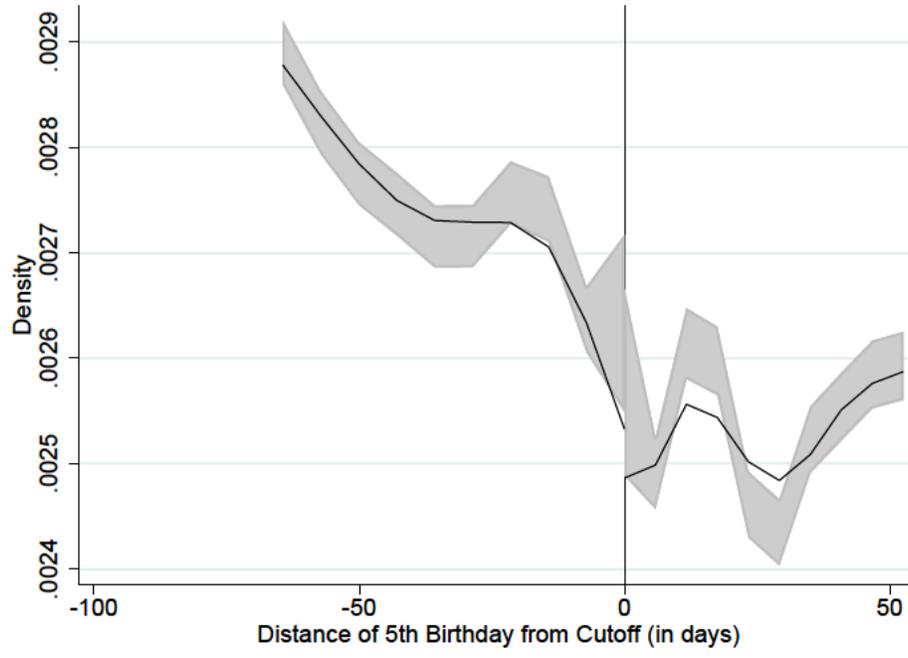


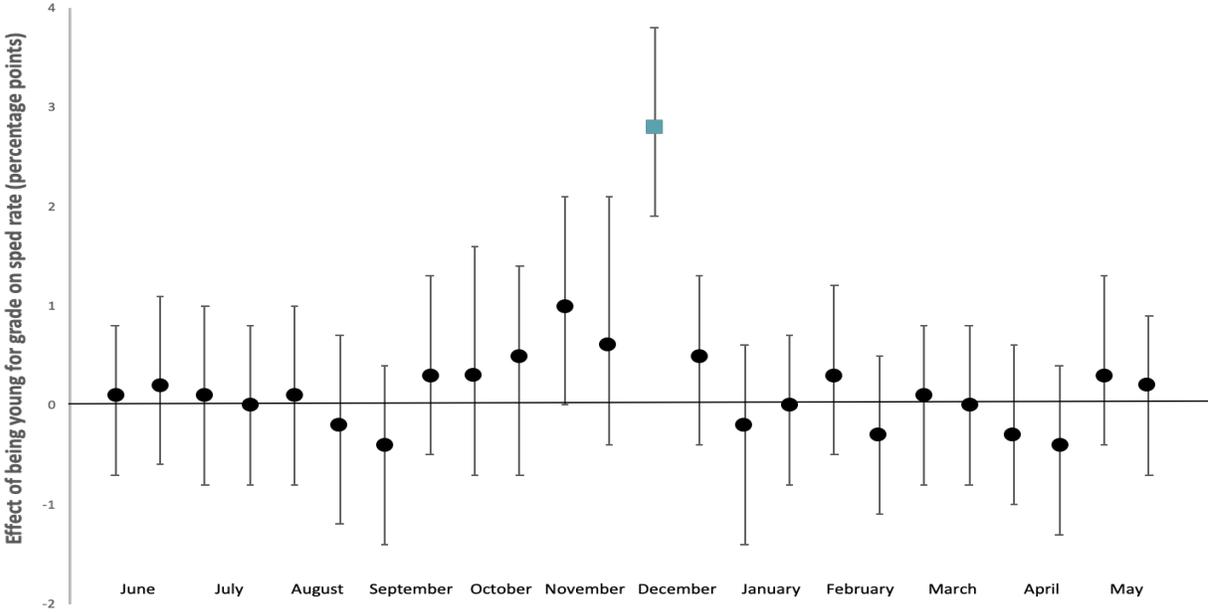
Appendix

Figure A.1: Density of the running variable through the cutoff



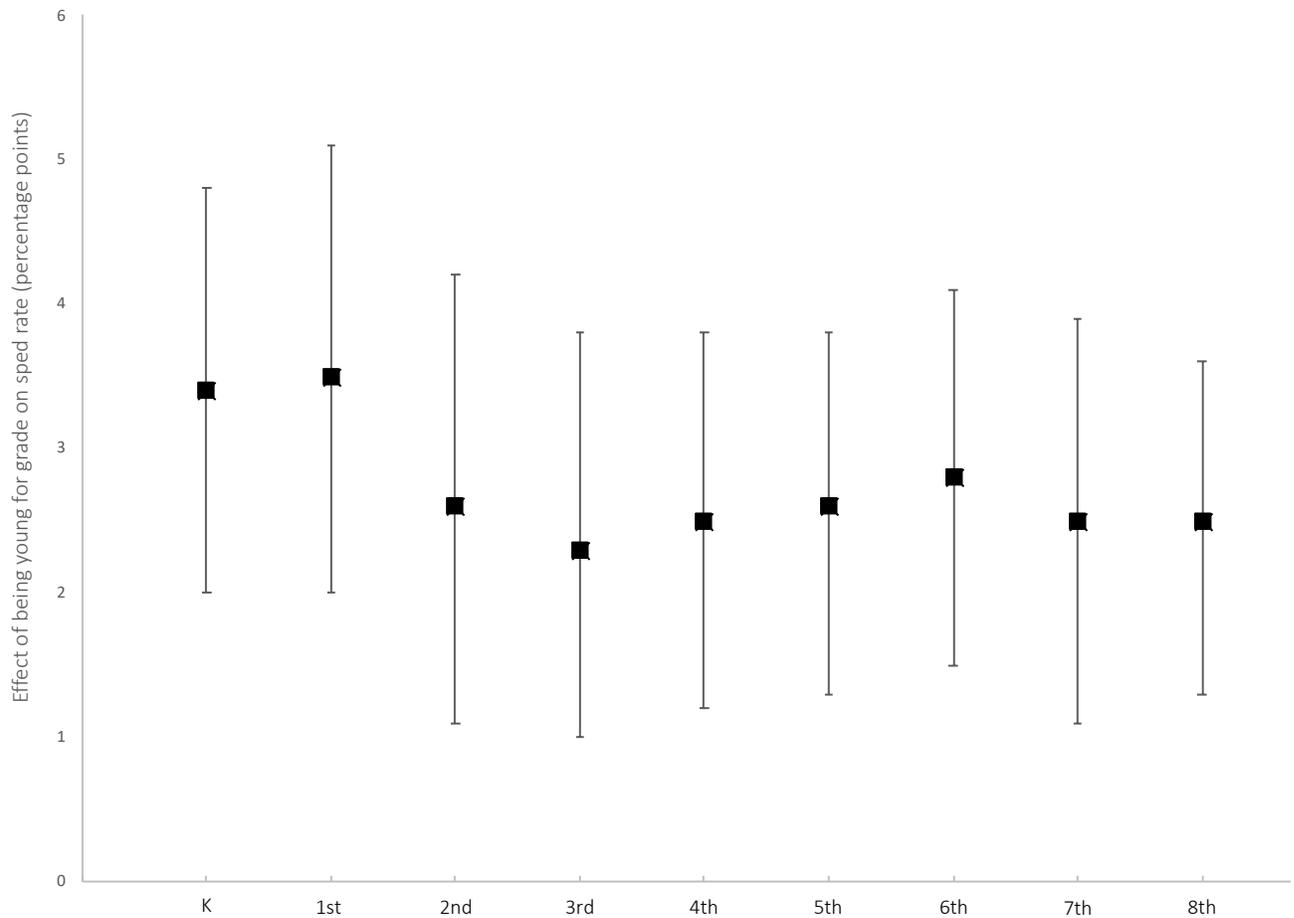
T= 1.4709 (p< 0.1413)

Figure A.2: Discontinuities in the outcome variable at points other than the cutoff compared with at the cutoff along the running variable



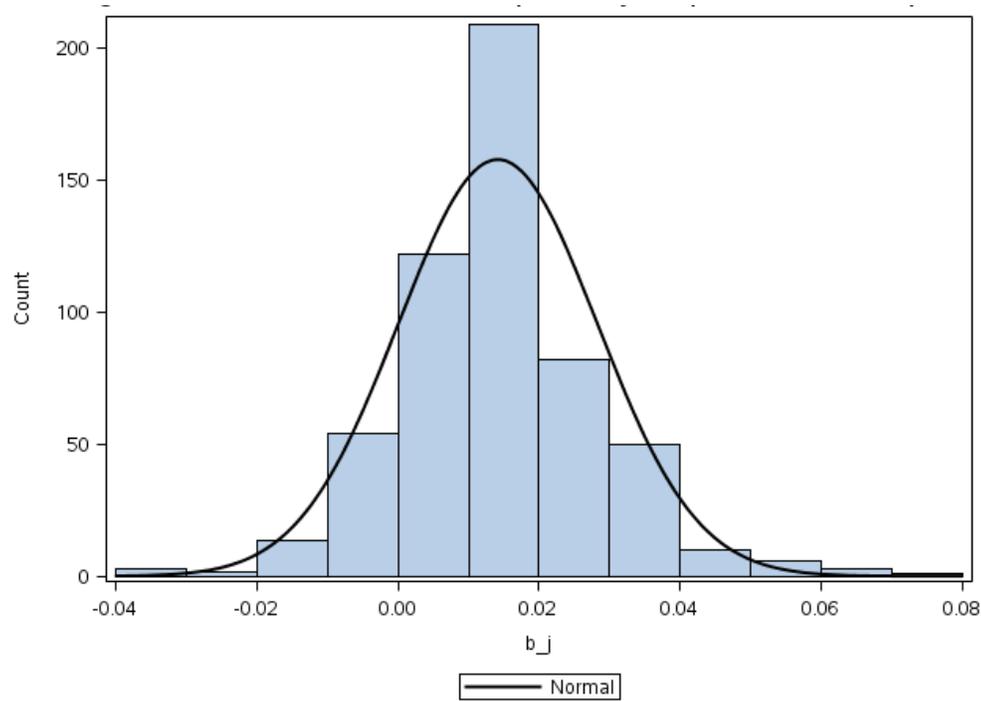
Note: Two pseudo-cutoffs were selected for each month of the year using a random date selector. Differences at each cut point were estimated using local polynomial estimation, with a polynomial order of 1 and a triangular kernel. Bandwidths were selected using one common MSE-optimal bandwidth for each discontinuity estimation.

Figure A.3. Effect of school starting age on being placed in special education in kindergarten through 8th grade for the 8th grade cohort



Note: All treatment effects were estimated using the primary specification (MSE-optimal bandwidth, polynomial order 1, triangular kernel, covariates and clustered standard errors at the district-level) for kindergarten eligible cohorts from 02-03 to 09-10.

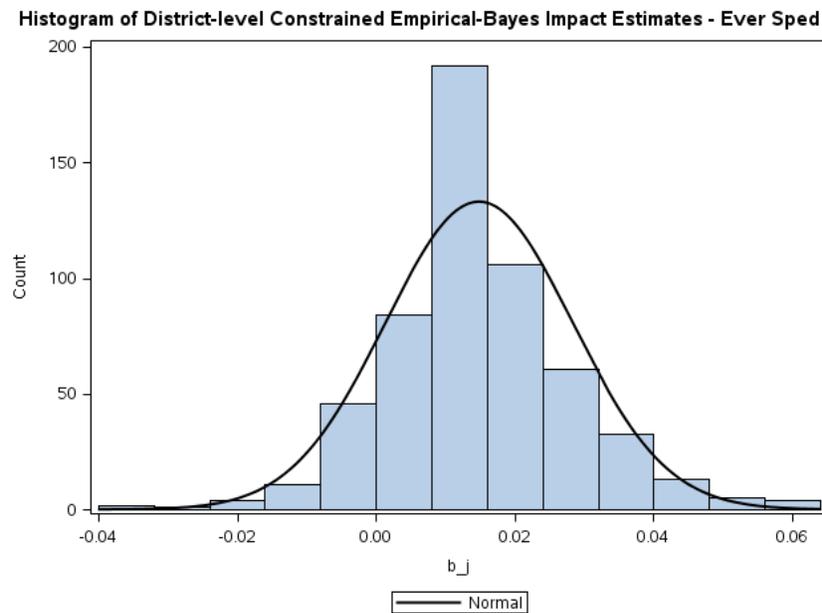
Figure A.4. Histogram of district-level constrained empirical-Bayes impact estimates on kindergarten special education identification



Estimated grand mean difference= 0.014, $p < 0.0001$
Estimated tau= < 0.0001 , p on Q-statistic= < 0.0002

Note: The grand mean effect is smaller for the district-level analysis than for the ISD-level analysis due to an analytic decision to exclude the charter school sites from the cross-district analysis. I chose to exclude the charter school sites from these analyses is because there are very few kindergarten students in a given cohort whose birthdays fall within the analytic bandwidth, making those site-specific estimates particularly imprecise. All results presented in the main text are robust to the exclusion of charter schools (results available upon request).

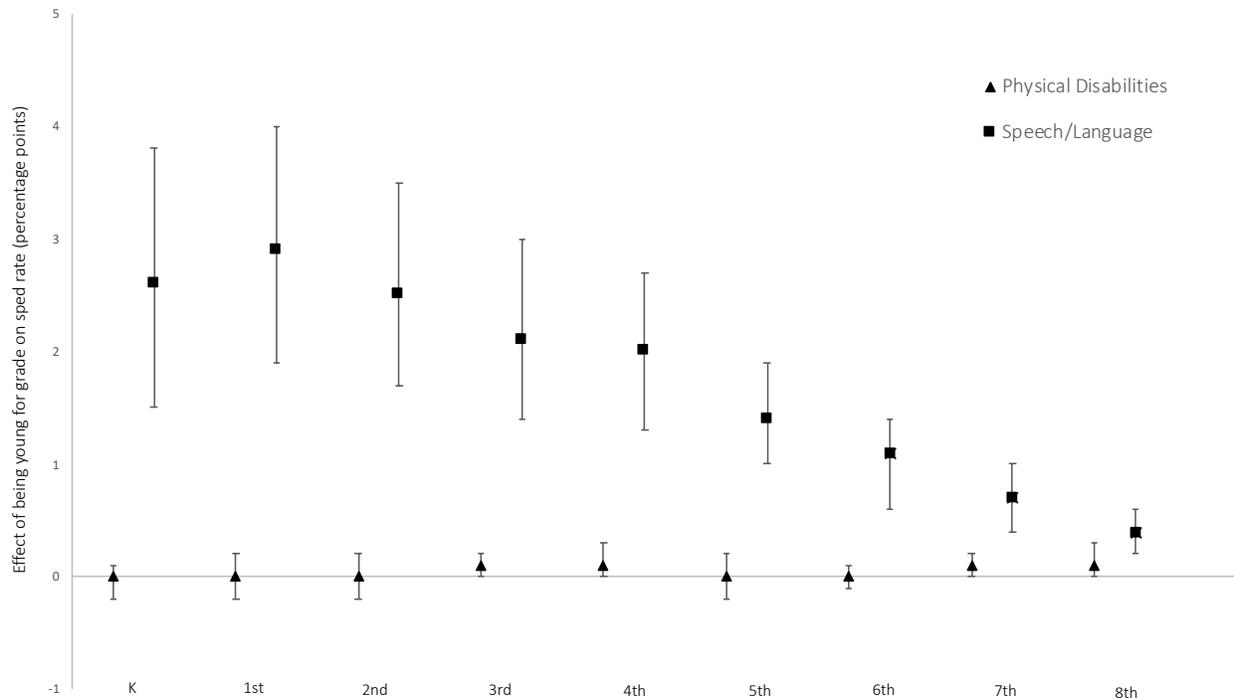
Figure A.5. Histogram of district-level constrained empirical-Bayes impact estimates on ever being placed in special education



Estimated grand mean difference= 0.015, $p = <0.0001$
Estimated tau= <0.0001 , p on Q-statistic= <0.0001

Note: The grand mean effect is smaller for the district-level analysis than for the ISD-level analysis due to an analytic decision to exclude the charter school sites from the cross-district analysis. I chose to exclude the charter school sites is because there are very few kindergarten students in a given cohort whose birthdays fall within the analytic bandwidth, making those site-specific estimates particularly imprecise. All results presented in the main text are robust to the exclusion of charter schools (results available upon request).

Figure A.6: The effect of being young for grade on the likelihood of receiving services for speech/language impairment and for physical/severe disabilities in kindergarten through 8th grade



Note: Physical/severe disabilities include all primary disability classifications of orthopedic impairment, hearing/visual impairments, deaf-blindness, traumatic brain injuries, and severe multiple impairments. I also estimate the effects on physical disabilities alone (orthopedic, hearing/visual and deaf-blindness) as a sensitivity check and found similar effects (results available upon request). All treatment effects were estimated using the primary specification (MSE-optimal bandwidth, polynomial order 1, triangular kernel, covariates, and district-level clustered standard errors).

Figure A.7. Effect of being the youngest in grade on special education identification in kindergarten for students in high and low variance classrooms

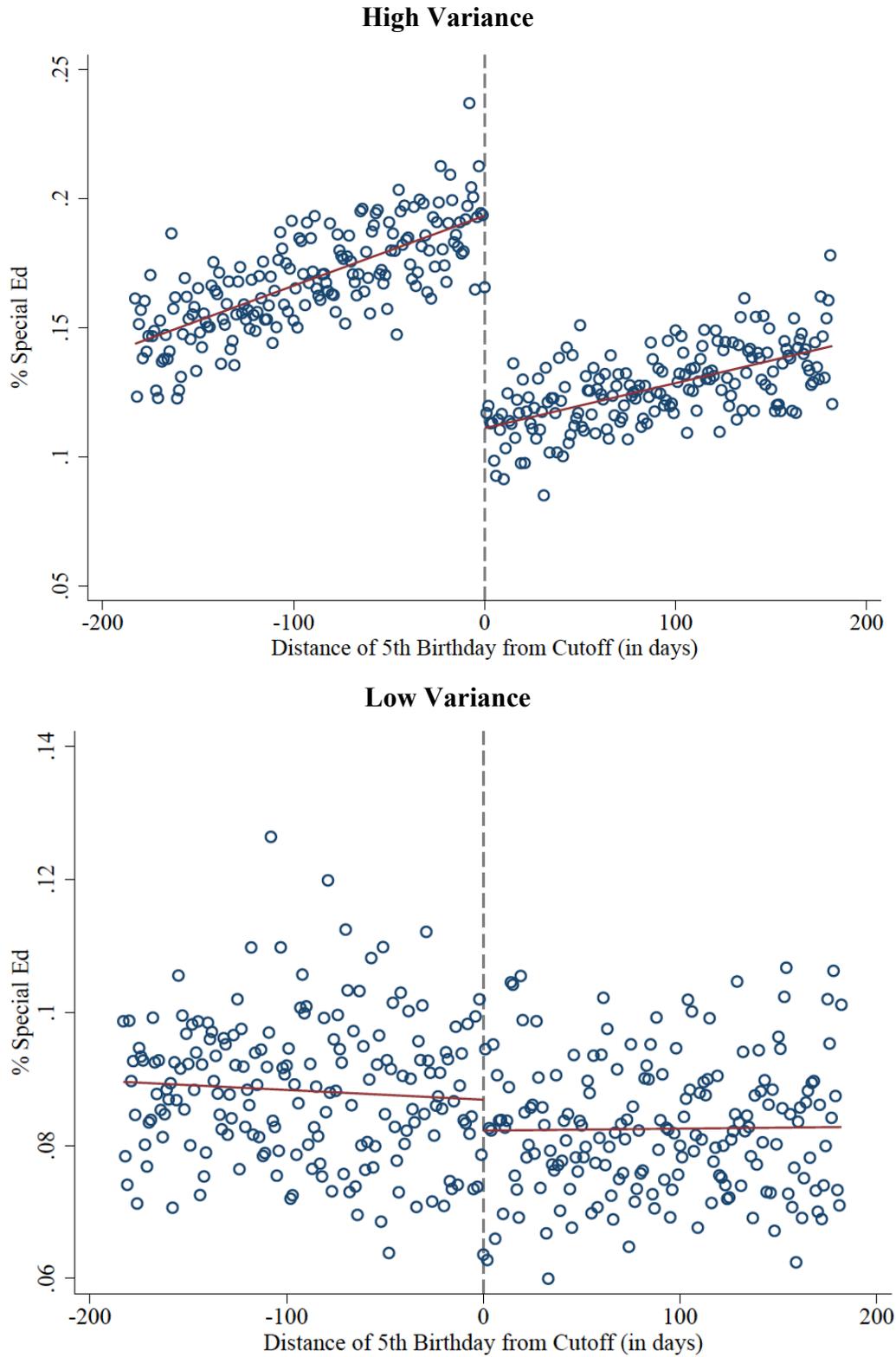


Table A.1. Variation in pretreatment or time-invariant characteristics through the cut point

	Estimated Difference in percentage points	Robust SE	Robust CI	Control Mean
Female	0.9**	0.3	[0.3 , 1.8]	48.77
<i>Race/Ethnicity</i>				
White	0.7	0.4	[0.0, 1.8]	67.99
Black	-0.1	0.4	[-1.0, 0.5]	20.77
Hispanic	-0.3	0.2	[-0.6 , 0.2]	6.91
Asian	-0.3*	0.1	[-0.6 , 0.0]	3.12
Poor	0.3	0.4	[-0.8 , 1.1]	43.17
Migrant	0.1	0.1	[0.0 , 0.2]	0.28
Early On- IEP	-0.1	0.1	[-0.3 , 0.1]	1.50

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Differences in covariates at the cut-point 0 were estimated using local polynomial estimation, with a polynomial order of 1 and a triangular kernel. Bandwidths were selected using one common MSE-optimal bandwidth, with bandwidth sizes as follows: Female +/- 60.2, White +/- 39.5, Black +/- 38.4, Hispanic +/- 69.2, Asian +/- 52.1, Poor +/- 47.3, Migrant +/- 37.5, EO +/- 76.4. All estimates have been converted to percentages and percentage point differences by dividing the estimate by 100.

Table A.2: LATE impacts of being young in grade on special education service receipt in K-8

	K	1st	2nd	3rd	4th	5th	6th	7th	8th
First Stage	0.81***	0.78***	0.79***	0.81***	0.82***	0.82***	0.82***	0.80***	0.84***
Robust CI	[0.80-0.83]	[0.76-0.80]	[0.78-0.81]	[0.69-0.83]	[0.80-0.83]	[0.81-0.84]	[0.80-0.83]	[0.78-0.81]	[0.83-0.86]
Enroll - Young	3.4***	3.5***	2.6***	2.3***	2.5***	2.6***	2.8***	2.5***	2.5***
Robust SE	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.6
Robust CI	[2.0 , 4.8]	[2.0 , 5.1]	[1.1 , 4.2]	[1.0 , 3.8]	[1.2 , 3.8]	[1.3 , 3.8]	[1.5 , 4.1]	[1.1 , 3.9]	[1.3 , 3.6]
BW N	37	29	32	36	38	39	37	35	46

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Covariates are female, Black, Hispanic, Asian, FRPL, Migrant, Early On (indicates prior access to early intervention but not receiving services), and fixed effects for eligible year 03-04 through 11-12. The primary specification has a linear functional form and uses a mean squared error optimal bandwidth selector and a triangular kernel. Standard errors are clustered at the district-level (district most enrolled in child's first kindergarten year- i.e., year 0).

Table A.3: LATE impacts of being young in grade on special education service receipt in K-5 for sex, race/ethnicity, and socioeconomic subgroups

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<i>Sex</i>						
Male	4.4*** [2.6 , 6.2] 11.86	3.9*** [1.8 , 6.0] 14.66	2.9** [0.8 , 5.0] 16.98	3.2*** [1.5 , 5.0] 18.12	3.2*** [1.6 , 4.9] 18.54	3.5*** [1.4 , 5.5] 18.17
Female	2.2*** [1.3 , 3.2] 5.59	2.4*** [1.4 , 3.6] 6.84	2.0** [0.8 , 3.4] 8.40	1.3* [0.2 , 2.5] 9.41	1.9** [0.5 , 3.4] 9.88	2.4*** [1.0 , 3.9] 9.85
<i>Race/Ethnicity</i>						
White	3.8*** [2.6 , 5.0] 9.43	3.2*** [2.0 , 4.4] 11.48	1.9** [0.4 , 3.3] 13.44	1.9** [0.6 , 3.3] 14.29	2.2** [0.7 , 3.8] 14.34	2.5** [0.8 , 4.2] 13.76
Black	2.7* [0.0 , 5.3] 8.00	3.0* [0.2 , 5.7] 9.89	4.0** [1.2 , 7.0] 11.78	3.6*** [1.5 , 5.8] 13.35	4.5*** [1.8 , 7.4] 15.24	4.5** [1.2 , 7.8] 15.92
Hispanic	2.5 [-0.8 , 5.8] 7.33	4.0* [0.5 , 7.6] 9.43	2.4 [-1.2 , .5.9] 11.47	2.3 [-2.0 , 6.3] 12.68	0.029 [-0.9 , 6.8] 13.49	3.5* [0.1 , 7.2] 13.99
<i>Poverty</i>						
FRPL	3.1** [1.1 , 5.2] 10.04	3.4** [1.0 , 5.7] 12.48	2.9* [0.3 , 5.5] 14.96	2.8** [0.6 , 5.1] 16.41	3.2** [0.9 , 5.5] 17.47	3.3** [1.0 , 5.6] 17.85
Not FRPL	3.4*** [2.4 , 4.5] 7.87	3.3*** [2.0 , 4.7] 9.69	2.6** [1.0 , 4.2] 11.21	2.4** [0.9 , 3.9] 11.93	2.5*** [1.2 , 3.9] 11.81	2.7*** [1.1 , 4.4] 11.34

Note: * p<0.05, ** p<0.01, *** p<0.001. Fixed effects for eligible year 03-04 through 11-12. The primary specification has a linear functional form and uses a mean squared error optimal bandwidth selector and a triangular kernel. Standard errors are clustered at the district-level (district most enrolled in child's first kindergarten year- i.e., year 0). Robust confidence intervals are in brackets.

Table A.4. Treatment effect sensitivity to data-driven bandwidth selectors

	Sped in K	Sped in K	Sped in K	Sped in K
First Stage	0.85***	0.82***	0.80***	0.77***
First Stage CI	[0.84, 0.86]	[0.79, 0.83]	[0.78, 0.83]	[0.73, 0.79]
Enroll - Young	3.3***	3.3***	3.5***	3.5***
Robust SE	0.6	0.6	0.7	0.7
Robust CI	[2.1 , 4.5]	[2.2 , 4.6]	[2.2 , 4.8]	[2.2 , 4.9]
BW Select	mserd	msetwo	cerrd	certwo
BW L	50	92	34	63
BW R	50	39	34	27
Covariates	Y	Y	Y	Y
Cluster Var	District	District	District	District

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Covariates are female, Black, Hispanic, Asian, FRPL, Migrant, Early On (indicates prior access to early intervention but not receiving services), and fixed effects for eligible year 03-04 through 11-12. Standard errors are clustered at the district-level (district most enrolled in child's first kindergarten year- i.e., year 0). MSERD= One common mean squared error optimal bandwidth. MSETWO= Two different mean squared error optimal bandwidths on each side of the cutoff. CERRD= One common coverage error rate optimal bandwidth. CERTWO= Two different coverage error rate optimal bandwidths on each side of the cutoff.

Table A.5. Estimates of the mean and standard deviation of the distribution of ISD-average treatment effects - Ever Special Ed

Bandwidth	Control Mean	Mean (Beta)			Standard Deviation (tau)	
		Est.	(SE)	p-value	Est	p-value
+/- 50	19.05	2.19	0.27	<.0001	0.001	0.0036
+/-34	19.02	2.02	0.32	<.0001	0.001	0.0075
+/- 30	19.08	2.04	0.41	<.0001	0.001	0.0637
+/- 15	18.95	1.95	0.58	0.0007	0.003	0.0545

Note: Covariates included were the running variable, gender (female=1), race (Black, Hispanic, Asian, migrant, early on no services, and binary indicators of kindergarten eligible cohort year. For intent-to-treat estimates, the ISD value was imputed for students who did not enroll in their kindergarten eligible year by using the ISD value of their first enrollment year (year 1).

Table A.6. Overall and differential sample attrition for on special education outcomes in follow-up years 1-5 for the full 5th grade sample (cohorts 02-03 through 12-13)

	Year 1	Year 2	Year 3	Year 4	Year 5
<i>Overall Attrition- Eligible</i>					
Control Intercept	3.83	6.20	7.84	9.24	17.50
Treatment Intercept	3.47	6.76	8.87	10.22	11.84
Difference	-0.28**	0.54**	0.89***	0.86***	-5.79***
SE	(0.11)	(0.17)	(0.18)	(0.23)	(0.52)
<i>Differential Attrition</i>					
Female	2.91*	3.26*	3.47**	1.89	-2.11
	[0.06]	[0.07]	[0.07]	[0.04]	[-0.04]
White	-5.71***	-7.13***	-12.25***	2.92*	6.85***
	[-0.12]	[-0.14]	[-0.25]	[0.06]	[0.14]
Black	6.32***	10.50***	0.02	-0.53	-0.87
	[0.15]	[0.25]	[0.00]	[-0.01]	[-0.02]
Hispanic	1.26	-0.88	0.21	0.46	0.53
	[0.04]	[-0.03]	[0.01]	[0.01]	[0.02]
Asian	-1.83	1.90	2.39	2.27	-3.98
	[-0.07]	[0.07]	[0.09]	[0.09]	[-0.17]
Poor	-2.65**	-3.25***	-3.30***	-5.89***	0.25
	[-0.05]	[-0.07]	[-0.07]	[-0.12]	[0.00]
Early On	1.64*	1.65*	5.53**	1.74*	0.43
	[0.05]	[0.05]	[0.17]	[0.05]	[0.01]

Note: Differences in the likelihood of having missing data were estimated using the same mean squared error optimal bandwidth selector as the primary specification. For the covariate-level analysis, the differences in the likelihood of having a value of one for each covariate at the cutoff are displayed in percentage point and effect sizes in brackets (standardized on the standard deviation of the control group mean).