

Supplemental Appendix

Table S1

Discrete-time survival models predicting special education services in odds ratios using only students with full data (total students = 24,880)

Variable	M1	M2	M3	M4
African American	1.317***	1.188**	0.659***	0.687***
American Indian	1.765***	1.680**	0.979	0.989
Latino	0.943	0.896~	0.702***	0.728***
Asian Indian	0.386***	0.381***	0.381***	0.375***
Cambodian	0.896	0.793	0.759	0.747
Chinese	0.474***	0.477***	0.715**	0.695**
Filipino	0.518***	0.506***	0.559***	0.562***
Hmong	0.487***	0.458***	0.363***	0.387***
Japanese	0.440**	0.460*	0.562~	0.567~
Korean	1.347	1.478	1.484	1.398
Laotian	0.499*	0.483*	0.471*	0.467*
Pacific Islander	0.455***	0.447***	0.432***	0.434***
Vietnamese	0.515***	0.502***	0.711**	0.695**
Other Asian	0.455***	0.428***	0.420***	0.418***
Female		0.453***	0.507***	0.506***
English learner		0.919	0.653***	0.701***
U.S.-born		1.272~	1.370*	1.309*
Free lunch		1.227***	0.772***	0.849**
Parent education (>=BA)		0.942	1.212***	1.160**
ELA score			0.988***	0.988***
Math Score			0.993***	0.992***
H ₀ : $\beta_{Asian} = \dots \beta_{OtherAsian}$	*	**	***	***
Cohort fixed effects		X	X	X
School fixed effects				X
-2 log likelihood	25,766	25,325	22,578	22,438
Observations	135,912	135,912	135,912	135,912

Note. All models include dichotomous time variables for grades K-9. Reference category for racial/ethnic variables is White students. ELA = English language arts. ELA and math scores are from the second grade or earliest available California Standardized Testing and Reporting (STAR) state exams. H₀ tests the null hypothesis that parameters for each AAPI group are equal. Models 1-3 adjusts standard errors for school-level clustering. ~ $p < .01$ * $p < .05$, ** $p < .01$, *** $p < .001$.

Table S2

Discrete-time survival models predicting special education services by disability in odds ratios with full data

Variable	SLI	SLI	SLD	SLD	AUT	AUT	OHI	OHI
African American	1.119	0.834*	2.187***	0.783*	0.746*	0.295***	1.150	0.541**
American Indian	1.624*	1.225	2.610***	0.942	0.339	0.229	2.010	1.182
Latino	0.921	0.889	1.467***	0.802*	0.534***	0.568**	0.512***	0.498***
Asian Indian	0.430***	0.506**	0.454**	0.315***	0.604~	0.833	0.085*	0.123*
Cambodian	0.927	0.912	1.876	1.338	0.763	0.919	--	--
Chinese	0.611***	0.815	0.295***	0.465**	0.790	1.452	0.125**	0.253~
Filipino	0.640***	0.686**	0.409***	0.470***	1.243	1.198	0.096**	0.115**
Hmong	0.603**	0.612*	0.774	0.437***	0.094***	0.150~	0.200*	0.328
Japanese	0.635	0.693	0.250~	0.421	0.264	0.599	0.389	0.743
Korean	1.500	1.556	2.314*	3.584**	1.311	1.643	--	--
Laotian	0.712	0.773	0.729	0.581	--	--	0.459	0.610
Pacific Islander	0.489**	0.546*	0.883	0.767	0.527	0.215	--	--
Vietnamese	0.723*	1.011	0.407***	0.497**	0.803	1.280	0.059**	0.125*
Other Asian	0.524**	0.576**	0.501**	0.409**	0.536~	0.390	0.212*	0.287~
Female		0.463***		0.820**		0.186***		0.600**
English learner		0.656***		0.880		0.494**		0.394**
U.S.-born		1.326		1.375		0.713		0.547
Free lunch		0.849*		0.994		0.620**		0.537***
Parent education ($\geq$ BA)		1.134*		0.995		1.873***		1.051
ELA score		0.994***		0.974***		0.996*		0.991***
Math Score		0.997***		0.988***		0.986***		0.987***
$H_0: \beta_{Asian} = \dots \beta_{OtherAsian}$		*	***	***	~		***	**
Cohort fixed effects		X		X		X		X
School fixed effects		X		X		X		X
-2 log likelihood	14414	13752	13,146	9,397	2961	2455	2929	2463
Observations	130,087	138,087	143,274	143,274	144,540	144,540	142,200	142,200

Note. All models include binary time variables for grades K-9. Reference category for racial/ethnic variables is White students. -- indicates parameter could not be estimated due to sample size or collinearity issues. SLI = speech language impairment, SLD = specific learning disability, ASD = autism spectrum disorder, OHI = other health impairment. ELA = English language arts. ELA and math scores are from the second grade earliest available California Standardized Testing and Reporting (STAR) state exams. H_0 tests the null hypothesis that parameters for each AAPI group are equal. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S3

Discrete-time survival models predicting special education services in odds ratios, with sample of students beginning in grade two (total students = 42,807)

Variable	M1	M2	M3	M4
African American	1.562***	1.397***	0.610***	0.675***
American Indian	1.585~	1.462	0.717	0.754
Latino	1.049	0.818*	0.638***	0.703***
Asian Indian	0.296***	0.217***	0.204***	0.205***
Cambodian	1.271	1.012	1.167	1.148
Chinese	0.251***	0.219***	0.425***	0.408***
Filipino	0.444***	0.435***	0.538***	0.562***
Hmong	0.487**	0.331***	0.288***	0.325***
Japanese	0.347*	0.405~	0.458	0.473
Korean	0.406	0.459	0.532	0.424
Laotian	0.495	0.317*	0.362*	0.346*
Pacific Islander	0.462**	0.392**	0.459**	0.484*
Vietnamese	0.358***	0.245***	0.426***	0.406***
Other Asian	0.434***	0.340***	0.341***	0.346***
Female		0.544***	0.633***	0.627***
English learner		1.441***	0.658***	0.739**
U.S.-born		1.555*	1.611*	1.478~
Free lunch		1.290***	0.712***	0.840*
Parent education ($\geq$ BA)		0.845*	1.225**	1.141~
ELA score			0.982***	0.981***
Math Score			0.990***	0.990***
$H_0: \beta_{Asian} = \dots \beta_{OtherAsian}^a$	***	***	***	***
Cohort fixed effects		X	X	X
School fixed effects				X
-2 log likelihood	13160	12303	9821	9669
Observations	93492	89208	88061	88060

Note. All models include dichotomous time variables for grades K-9. Reference category for racial/ethnic variables is White students. ELA = English language arts. ELA and math scores are from the second grade California Standardized Testing and Reporting (STAR) state exams. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. ^a tests the null hypothesis that parameters for each AAPI group is equal.

Table S4

Discrete-time survival models predicting special education services by disability in odds ratios, with sample of students beginning in grade two (total students = 42,807)

Variable	SLI	SLI	SLD	SLD	AUT	AUT	OHI	OHI
African American	1.004	1.063	2.349***	0.831	0.712	0.292*	1.252	0.518**
American Indian	1.972	1.440	2.002*	0.747	--	--	1.488	0.995
Hispanic	0.802	0.905	1.684***	0.848	1.052	0.943	0.487***	0.408***
Asian Indian	0.340*	0.320*	0.511*	0.310***	0.637	0.804	0.105*	0.129*
Cambodian	1.942	2.330	2.334*	1.803	--	--	--	--
Chinese	0.518*	0.625	0.356***	0.566~	--	--	--	--
Filipino	0.956	1.194	0.455***	0.520**	1.306	1.992	0.061**	0.061**
Hmong	0.815	0.858	0.738	0.412**	--	--	0.245~	0.327
Japanese	0.658	0.682	0.315	0.595	--	--	0.471	0.716
Korean	0.702	0.738	1.092	1.797	6.503*	5.049~	--	--
Laotian	0.737	0.881	0.911	0.572	--	--	0.558	0.662
Pacific Islander	0.702	1.014	0.788	0.731	--	--	--	--
Vietnamese	0.756	0.917	0.444***	0.459**	0.659	0.747	0.072**	0.133*
Other Asian	0.678	0.884	0.548*	0.450**	--	--	0.259~	0.296~
Female		0.517***		0.894		0.252***		0.573**
English learner		0.909		0.943		1.094		0.414*
U.S.-born		2.062		1.343		2.709		0.760
Free lunch		0.751*		0.951		0.767		0.524**
Parent education ($\geq$ BA)		1.172		0.992		1.497		1.054
ELA score		0.995**		0.973***		0.993~		0.992***
Math Score		0.997*		0.989***		0.986***		0.986***
$H_0: \beta_{Asian} = \dots \beta_{OtherAsian}$ ^a	***	***	***	***	***	***	***	***
Cohort fixed effects		X		X		X		X
School fixed effects		X		X		X		X
-2 log likelihood	4359	3867	10847	7026	1144	773	2363	1843
Observations	95781	89932	100482	94266	87183	58784	95712	82993

Note. All models include binary variables for grades K-9. Reference category for racial/ethnic is White students. --indicates parameter could not be estimated due to sample size. SLI = speech language impairment, SLD = specific learning disability, ASD = autism spectrum disorder, OHI = other health impairment. ELA = English language arts. ELA and math scores are from the second grade state exams * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. ^a tests the null hypothesis that parameters for each AAPI group is equal.

Table S5

Logit models predicting ever receiving special education services in odds ratios with pooled student sample across grades.

Variable	M1	M2	M3	M4
African American	1.181***	1.005	0.621***	0.650***
American Indian	1.199	1.169	1.006	1.007
Latino	0.857***	0.901*	0.731***	0.758***
Asian Indian	0.412***	0.487***	0.418***	0.405***
Cambodian	0.654	0.753	0.754	0.744
Chinese	0.487***	0.575***	0.737*	0.712*
Filipino	0.511***	0.519***	0.517***	0.520***
Hmong	0.430***	0.509***	0.362***	0.382***
Japanese	0.656~	0.674~	0.738	0.736
Korean	0.994	1.325	1.658	1.584
Laotian	0.382***	0.397**	0.441*	0.440*
Pacific Islander	0.508***	0.574***	0.431***	0.431***
Vietnamese	0.554***	0.638***	0.764*	0.745*
Other Asian	0.555***	0.605***	0.495***	0.494***
Female		0.418***	0.473***	0.470***
English learner		0.693***	0.549***	0.590***
U.S.-born		1.362**	1.389*	1.328*
Free lunch		1.378***	0.780***	0.851**
Parent education ($\geq$ BA)		1.028	1.258***	1.202***
ELA score			0.988***	0.988***
Math Score			0.993***	0.993***
$H_0: \beta_{Asian} = \dots \beta_{OtherAsian}^a$	***	***	***	***
Cohort fixed effects		X	X	X
School fixed effects				X
-2 log likelihood	28925	26117	14727	14589
Observations	42553	39577	24878	24877

Note. Reference category for racial/ethnic variables is White students. ELA = English language arts. ELA and math scores are from the second grade California Standardized Testing and Reporting (STAR) state exams. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. ^a tests the null hypothesis that parameters for each AAPI group is equal.

Table S6

Logit models predicting ever receiving special education by disability in odds ratios with student sample across grades (total students = 42,807)

Variable	SLI	SLI	SLD	SLD	AUT	AUT	OHI	OHI
African American	0.956	0.778**	2.043***	0.771*	0.730*	0.277***	1.078	0.554**
American Indian	1.227	1.218	1.890**	0.882	0.309~	0.210	1.490	1.128
Hispanic	0.837***	0.887	1.411***	0.901	0.537***	0.562**	0.530***	0.536**
Asian Indian	0.428***	0.498***	0.522**	0.380**	0.580~	0.889	0.070**	0.153~
Cambodian	0.629	0.839	1.280	1.862	0.704	0.887	--	--
Chinese	0.589***	0.819	0.279***	0.532*	0.797	1.503	0.109**	0.314
Filipino	0.603***	0.687**	0.399***	0.491**	1.233	1.159	0.129***	0.112**
Hmong	0.500***	0.585**	0.603*	0.444**	0.130***	0.150~	0.208**	0.353
Japanese	0.988	1.003	0.408	0.446	0.267	0.573	0.426	0.708
Korean	1.376	2.221*	1.724	3.229*	1.239	1.774	--	--
Laotian	0.429*	0.688	0.748	0.632	--	--	0.386	0.714
Pacific Islander	0.504***	0.596*	0.761	0.804	0.578	0.207	--	--
Vietnamese	0.649***	0.975	0.437***	0.551*	0.833	1.329	0.097**	0.155~
Other Asian	0.617***	0.699~	0.557*	0.436**	0.517~	0.402	0.182*	0.329
Female		0.459***		0.783**		0.176***		0.523***
English learner		0.662***		0.729**		0.456***		0.337***
U.S.-born		1.454*		1.438~		0.674		0.530
Free lunch		0.822**		0.941		0.649*		0.566**
Parent education ($\geq$ BA)		1.199**		1.036		1.753***		1.093
ELA score		0.995***		0.972***		0.996~		0.991***
Math Score		0.997***		0.987***		0.986***		0.987***
$H_0: \beta_{Asian} = \dots \beta_{OtherAsian}$ ^a	***	***	***	***	***	***	***	***
Cohort fixed effects		X		X		X		X
School fixed effects		X		X		X		X
-2 log likelihood	19901	11341	12385	5552	5195	2000	3080	1791
Observations	42553	24877	42553	24877	42286	24456	41421	23707

Note. Reference category for racial/ethnic is White students. -- indicates parameter could not be estimated due to sample size. SLI = speech language impairment, SLD = specific learning disability, ASD = autism spectrum disorder, OHI = other health impairment. ELA = English language arts. ELA and math scores are from the second grade state exams * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. ^a tests the null hypothesis that parameters for each AAPI group is equal.

Table S7.
Demographic summary of students across cohorts

Cohort	Data Waves	n	Af Am	Am Ind	AAPI	Latino	White	Fem	ELL	US Born	Lunch	Parent Ed	ELA	Math	Any SPED
2004	10	3,863	17.3	0.9	25.8	24.5	31.6	49.4	31.9	95.1	57.3	37.3	356.5	379.9	13.2
2005	9	3,976	18.2	0.6	26.6	26.0	28.6	49.8	33.0	95.5	57.3	36.2	358.5	377.1	11.7
2006	8	4,023	19.0	0.7	26.3	28.2	25.8	49.6	34.7	94.2	58.7	35.3	358.1	380.8	12.0
2007	7	4,219	18.8	0.9	27.1	28.6	24.7	48.4	35.1	96.0	58.7	35.8	363.2	382.8	12.2
2008	6	4,108	18.2	0.9	27.5	30.7	22.8	49.0	36.7	95.8	60.1	33.9	366.7	386.0	11.4
2009	5	4,259	17.5	0.9	28.2	29.8	23.6	48.1	35.9	96.2	61.3	36.3	368.6	384.4	10.6
2010	4	4,529	16.8	0.7	29.0	29.4	24.1	49.1	34.3	96.9	60.5	37.6	372.3	389.4	11.7
2011	3	4,557	17.5	1.4	30.9	27.2	23.0	48.3	34.5	96.9	60.3	36.2	367.7	372.1	10.0
2012	2	4,692	16.4	1.4	32.4	26.6	23.2	47.4	34.3	97.4	57.9	35.9	--	--	8.8
2013	1	4,581	17.0	1.4	29.6	27.6	24.5	47.4	32.0	97.5	50.9	35.7	--	--	7.8

Note. Af Am = African American, Am Ind = American Indian, AAPI = Asian American Pacific Islander, Parent education represent bachelor's degree or higher. ELA = English language arts. ELA and math scores are from the second grade California Standardized Testing and Reporting (STAR) state exams. Scores are not available for cohort 2012 and 2013 because both kindergarten cohorts will not have taken the exams. Any SPED = any special education, rates are lower for later cohorts given that they have fewer waves of data.

Table S8
Summary of special education frequency by racial and ethnic group and disability type

Variable	Any Special Ed		SLD		SLI		AUT		OHI	
	N	%	N	%	N	%	N	%	N	%
African American	1,095	14.6	443	5.91	541	7.21	84	1.12	78	1.04
Am Indian	62	14.8	23	5.49	38	9.07	2	0.48	6	1.43
Hispanic	1,309	11.04	493	4.16	756	6.37	98	0.83	61	0.51
White	1,349	12.65	318	2.98	802	7.52	163	1.53	103	0.97
Asian Indian	82	5.62	23	1.58	49	3.36	13	0.89	1	0.07
Cambodian	16	8.65	7	3.78	9	4.86	2	1.08	0	0.00
Chinese	124	6.59	16	0.85	86	4.57	23	1.22	2	0.11
Filipino	165	6.88	29	1.21	112	4.67	45	1.88	3	0.13
Hmong	87	5.86	27	1.82	58	3.91	3	0.2	3	0.20
Japanese	21	8.68	3	1.24	18	7.44	1	0.41	1	0.41
Korean	20	12.58	8	5.03	16	10.06	3	1.89	0	0.00
Laotian	14	5.24	6	2.25	9	3.37	0	0	1	0.37
Pacific Islander	54	6.85	18	2.28	31	3.93	7	0.89	0	0.00
Vietnamese	157	7.42	28	1.32	106	5.01	27	1.28	2	0.09
Other Asian	84	7.43	19	1.68	54	4.78	9	0.8	2	0.18
Total	4,639	10.9	1,461	3.43	2,685	6.31	480	1.13	263	0.62

Note: SLI = speech or language impairment, SLD = specific learning disability, ASD = autism spectrum disorder, OHI = other health impairment.