Dual Language Immersion Education
Recent Research and Implications for English Learners

Dr. Jennifer L. Steele, American University, steele@american.edu, jensteele1.github.io
Presented to the Maryland EL Workgroup, September 30, 2021

Causal Research on Dual Language Immersion Education Has Blossomed in the Past Decade

- **Umansky & Reardon (2014):** 5400 Spanish-speaking ELs. Cumulative EL reclassification rates were highest for monolingual English programs until grade 7, at which point DLI programs surpassed them, reaching a 13-point advantage by the end of high school.
- **Valentino and Reardon (2015):** 14,000 ELs, many home languages. Those placed in any type of bilingual program—DLI, transitional bilingual, or developmental bilingual—grew faster in ELA than their peers placed in monolingual English programs. They began outperforming peers in monolingual English programs by grade 6 and reached a 0.15-SD advantage in ELA by grade 7.
- **Bibler (2020):** 510 grade K lottery applicants to two two-way-DLI programs in Charlotte-Mecklenburg. Estimated DLI-placement effects of 0.04 SD per year in reading for native English speakers and 0.06 SD in math for ELs, implying cumulative benefits of 0.22 SD and 0.33 SD, respectively, by grade 8.

IES Funded Two Causal Studies of Dual Language Immersion Effects

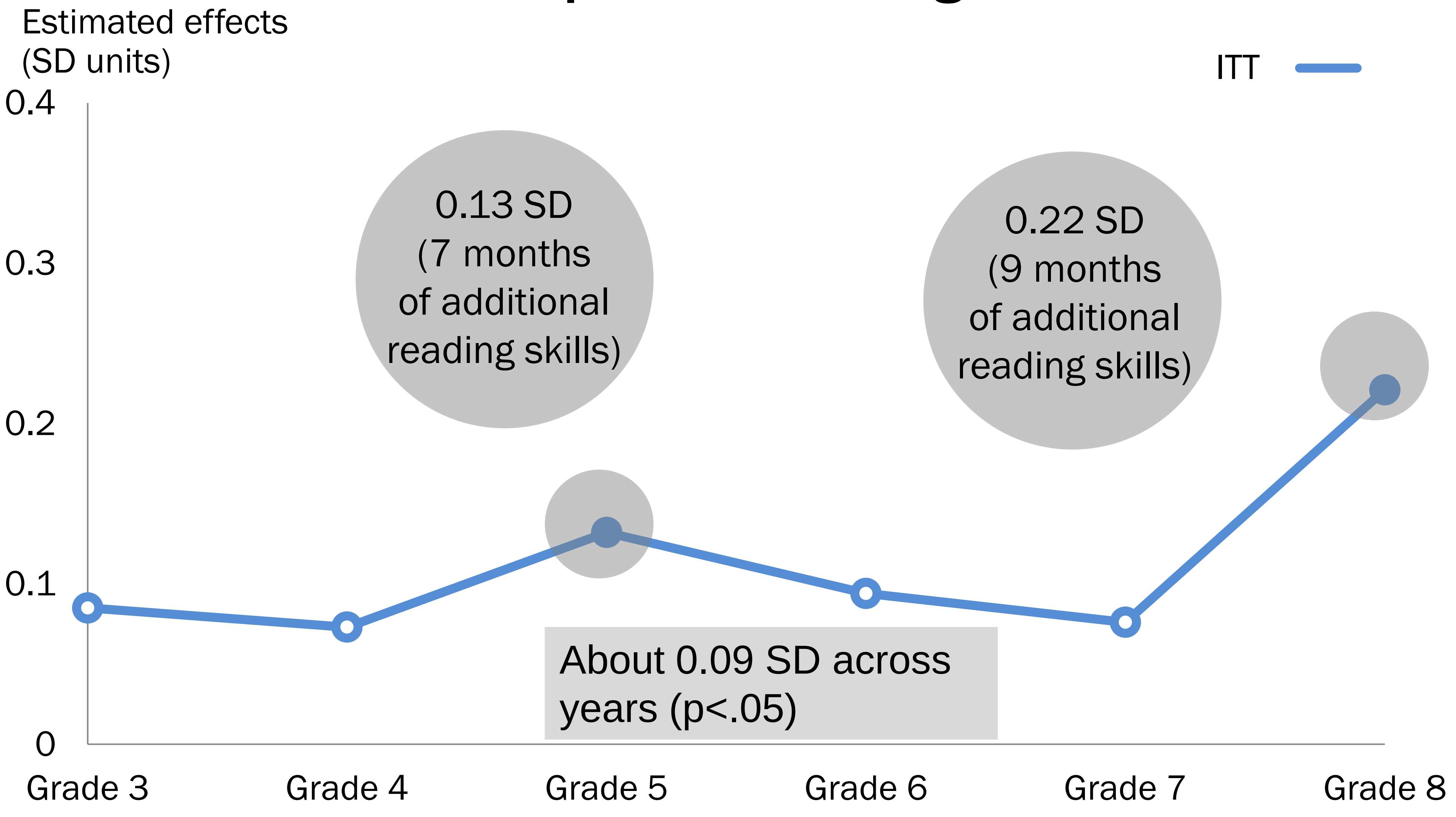
Portland, Oregon (2012-2016)

- Spanish, Mandarin, Japanese, Russian
- 1-way and 2-way
- In 2012, about 25% of schools offered DLI, and about 8% of students were in immersion
- 90/10 and 50/50 instructional models (most programs within larger schools)
- We tracked 2004-05 through 2010-11 K cohorts through 2013-14
- 1625 students randomized by kindergarten lottery
- Intent-to-treat is winning the DLI lottery

Utah (2017-2020)

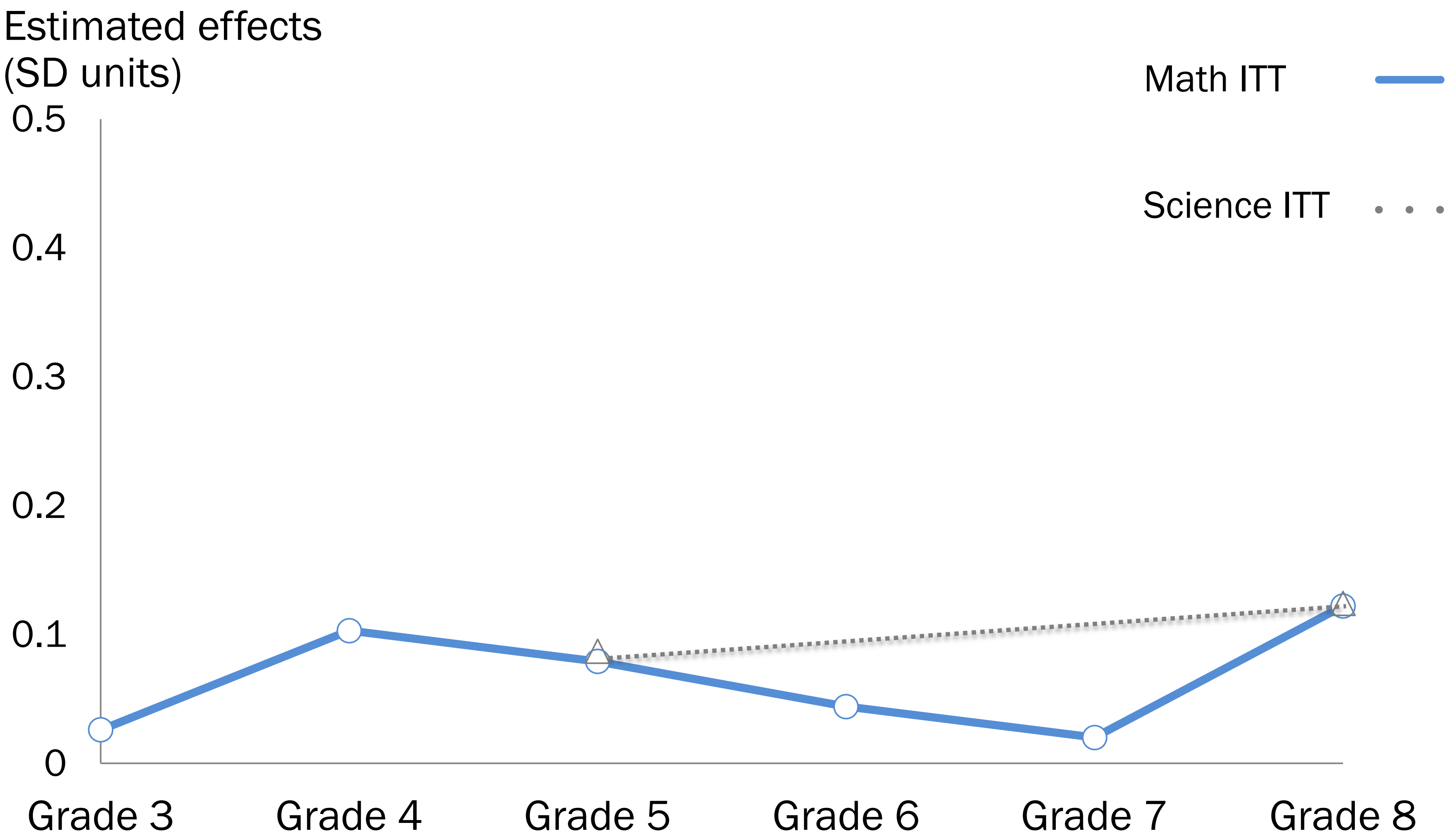
- Spanish, Mandarin, French, German, Portuguese
- 1-way and 2-way
- In 2019-20, about 224 public schools in Utah (23%) had a DLI program, and about 58,000 (9%) of students in DLI
- 50/50 instructional model (most programs within larger schools)
- We used data from 2000-01 through 2017-18
- About 201,000 students in schools that eventually launched DLI programs
- Intent-to-treat is number of first-grade DLI slots per pupil available in the student's first grade year

In Portland, Intent-to-Treat estimates in English language arts were positive and significant



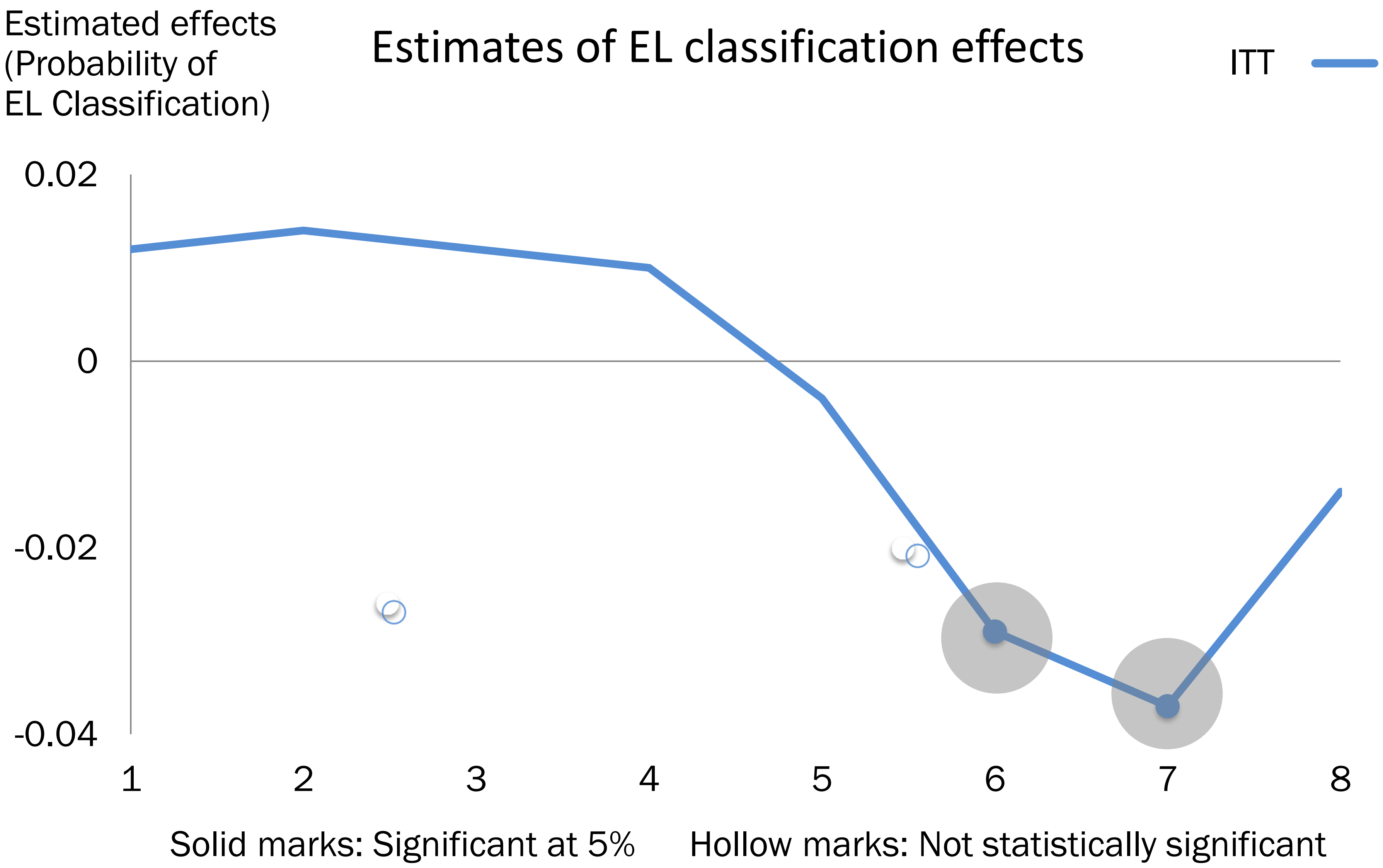
Solid marks: Significant at 5% Hollow marks: Not statistically significant

Intent-to-Treat estimates in math and science were not statistically distinguishable from zero



Solid marks: Significant at 5%   Hollow marks: Not statistically significant

Students randomly assigned to immersion were less likely to be EL by grade 6



Estimates did not differ significantly by program type or native language status

Reading, math, and science estimates were **statistically similar** for:

	Vs.	
Two-way		One-way programs
Spanish		Other languages (Mandarin, Japanese, Russian)
English learners		Native speakers of other languages
Students whose native language matches partner language		Students whose native language doesn't match partner language

Estimates also did not differ by race/ethnicity at statistically significant levels

Portland Study Offered Longitudinal Evidence from Seven Randomized Cohorts

Students randomly assigned to immersion (DLI):

Outperformed peers in **English language arts** by 9% of an SD (7-9 mo. in gr. 5 & 8), with no detriment to math or science skills

No significant differences by home language group or race/ethnicity

Reached *intermediate mid* to *high* partner language proficiency by grade 8

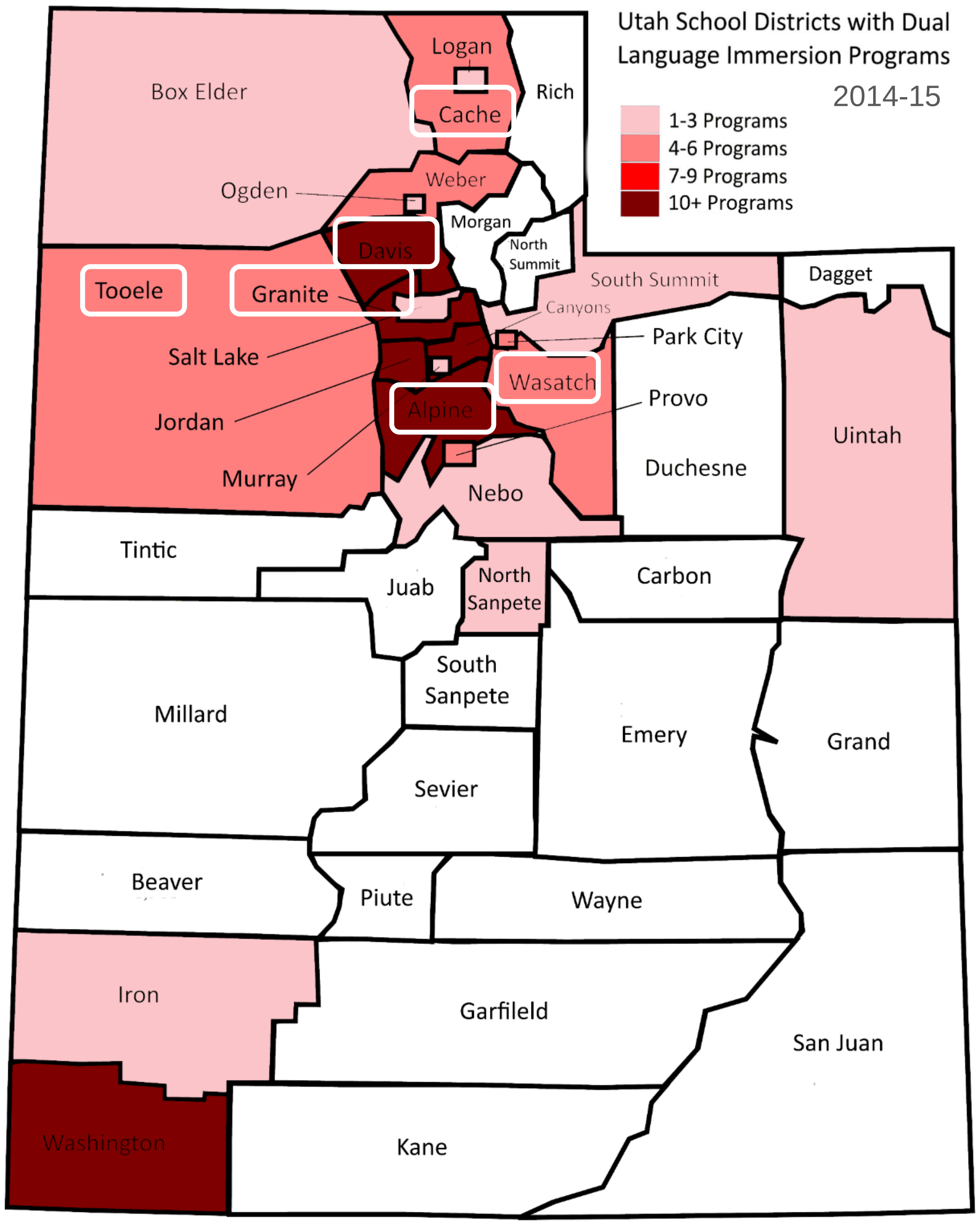
Had lower EL classification by grade 6

Per-pupil costs were an extra 2-4%

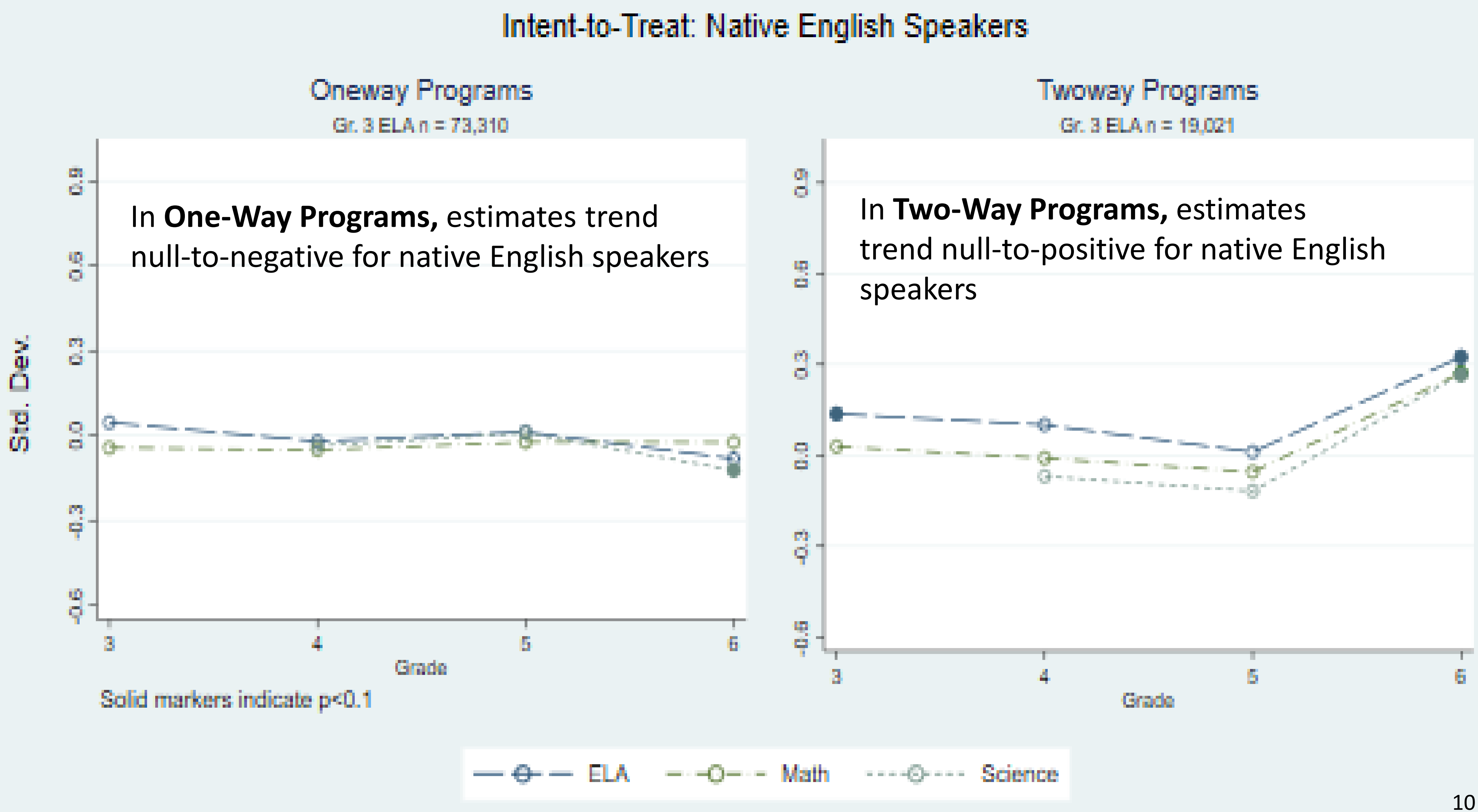
An extra $100 was linked to an additional 8% of an SD in ELA achievement

Extra spending explained about 1/3 of DLI enrollment effect

What Questions Remained: What are mechanisms behind DLI effects? Do effects differ if students' home language matches the partner language?

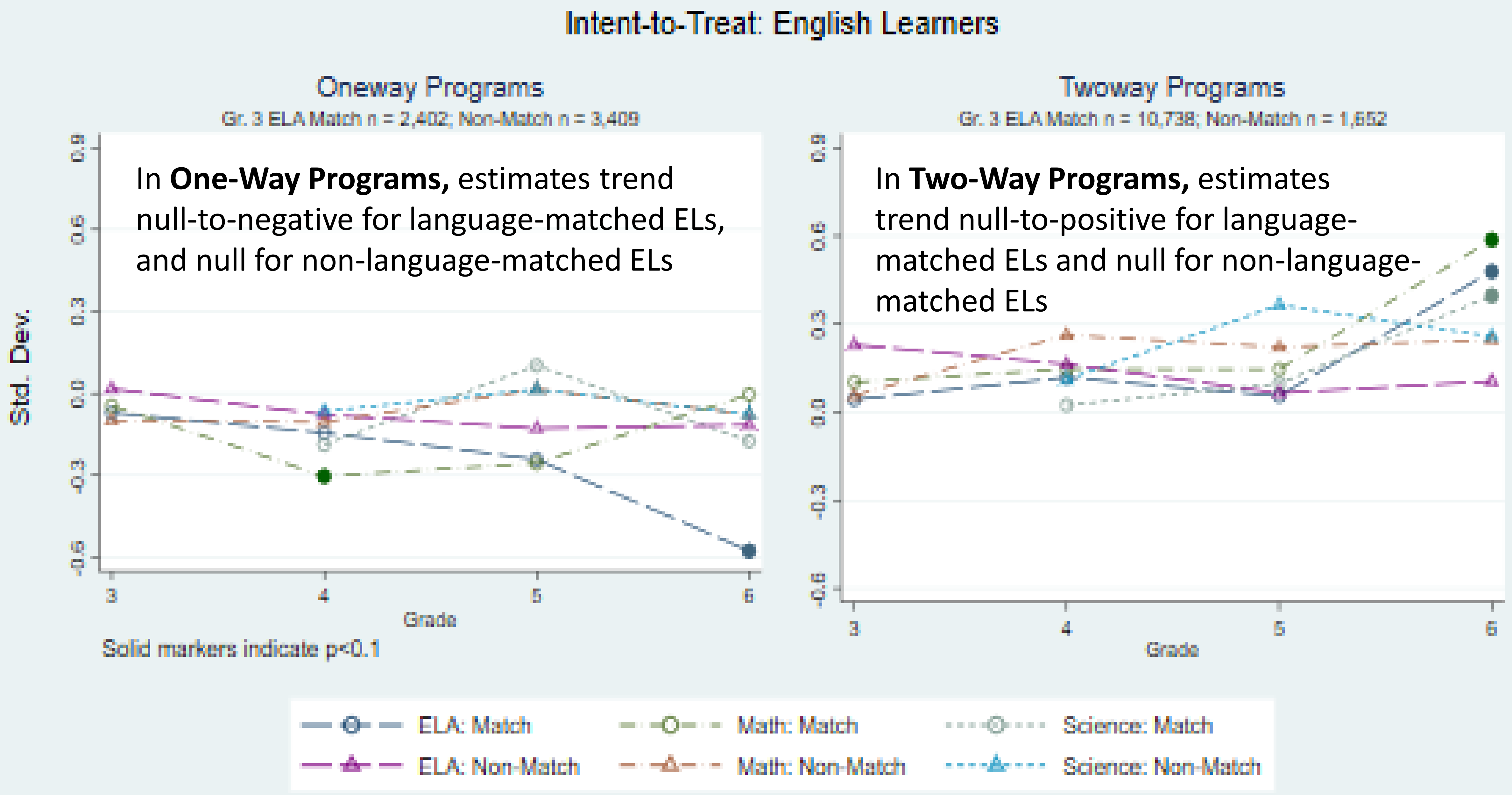


- ❑ In 2018, 22 of 41 Utah districts offered DLI
- ❑ DLI programs exist alongside monolingual English programs in the same schools
- ❑ Most districts offer DLI admission preferences for residentially zoned students
- ❑ Most DLI programs begin in grade 1 and continue through grade 9, with high school options



In **One-Way Programs,** estimates trend null-to-negative for native English speakers

In **Two-Way Programs,** estimates trend null-to-positive for native English speakers



In **One-Way Programs,** estimates trend null-to-negative for language-matched ELs, and null for non-language-matched ELs

In **Two-Way Programs,** estimates trend null-to-positive for language-matched ELs and null for non-language-matched ELs

Among ever-ELs in language-match schools, exit from EL status is higher as of grades 5 and 6 *(coefficient is differential probability of EL classification)*

	One-way		Two-way	
Grade	Home/ School Language Match	No Language Match	Home/ School Language Match	No Language Match
	(1)	(2)	(3)	(4)
1	0.031	0.044	0.019	0.065
	(0.027)	(0.031)	(0.012)	(0.044)
2	0.038	0.029	0.016	0.068
	(0.053)	(0.048)	(0.029)	(0.052)
3	-0.027	0.036	0.022	0.093
	(0.064)	(0.064)	(0.035)	(0.060)
4	-0.080	-0.006	-0.021	0.106
	(0.092)	(0.052)	(0.033)	(0.067)
5	-0.014	0.025	-0.082~	0.084
	(0.085)	(0.058)	(0.041)	(0.105)
6	-0.018	-0.006	-0.098*	0.143
	(0.141)	(0.072)	(0.041)	(0.160)
Schools gr. 1	68	79	29	29
Obs. gr. 1	2,545	3,585	11,574	1,695
R-sq gr. 1	0.067	0.106	0.118	0.107

Estimates Are Driven By Share of Students With Native Language Match in Pre-DLI Year

Grade	True Interaction Models			Placebo Interaction Models (Pre-Launch Year)		
	ELA	Math	Science	ELA	Math	Science
	(1)	(2)	(3)	(4)	(5)	(6)
One-Way Program Main Effect Coefficients						
All	0.006	-0.035	-0.069*	0.046	0.036	0.006
	(0.031)	(0.029)	(0.031)	(0.032)	(0.037)	(0.037)
3	0.056	-0.050		0.036	0.010	
	(0.037)	(0.037)		(0.041)	(0.042)	
4	-0.039	-0.082*	-0.091*	0.059	0.070	0.006
	(0.030)	(0.035)	(0.043)	(0.042)	(0.049)	(0.052)
5	-0.021	-0.041	-0.035	0.055	0.051	0.019
	(0.044)	(0.048)	(0.044)	(0.044)	(0.049)	(0.049)
6	-0.090	-0.019	-0.114*	0.038	0.028	-0.018
	(0.064)	(0.075)	(0.055)	(0.040)	(0.055)	(0.042)
Interaction Coefficients: Differential Effects for Unit Diff. in Language Match						
All	0.292*	0.378*	0.344	-0.167	-0.128	0.032
	(0.139)	(0.145)	(0.283)	(0.132)	(0.155)	(0.169)
3	0.114	0.339~		-0.190	-0.133	
	(0.131)	(0.193)		(0.174)	(0.159)	
4	0.457*	0.516**	0.465~	-0.231	-0.206	0.259
	(0.187)	(0.185)	(0.253)	(0.173)	(0.223)	(0.233)
5	0.216	0.207	0.256	-0.182	0.036	-0.119
	(0.264)	(0.232)	(0.369)	(0.155)	(0.180)	(0.173)
6	1.160**	0.918***	0.995***	-0.130	-0.175	0.004
	(0.409)	(0.269)	(0.243)	(0.150)	(0.167)	(0.217)
Sch. base gr.	100	100	100	100	100	100
Obs. base gr.	106,648	106,644	104,125	65,652	65,656	72,222
R-sq base gr.	0.106	0.093	0.116	0.105	0.092	0.118

Why Do One-Way and Two-Way Program Effects Differ in Utah?

- Programs use the same curriculum and professional development
- Results do not appear to be driven by different middle school feeder patterns, changes over time in who attends DLI schools, or differential attrition rates from public schools
- Tests comparing one-way and two-way programs with similar baseline demographics and focusing only on Spanish programs still find benefits only in two-way programs
- DLI effects strongly increase as the fraction of native-language-matched students in the school increases

Utah Study Offers Large-Scale Evidence from DLI Scaled Across a State

Utah's DLI objective was a globally competitive workforce

Null ITT estimates in most subjects/grades suggest students are on-par academically while pursuing bilingualism and biliteracy

- Watzinger-Tharp et al. (2018 & 2020): Utah DLI students are meeting partner-language benchmarks at nearly all grades (3-8) and linguistic skills
- Early DLI cohorts are earning Advanced Placement (AP) credit in their partner languages by start of high school

Positive estimates from **two-way programs** in grade 6 content areas and grades 5-6 EL exit rates suggest a ***cultural relevance mechanism*** that merits qualitative study

More Information

Jennifer Steele, steele@american.edu
Robert Slater, rslater@americancouncils.org

The Portland and Utah studies were funded by grants #R305E120003 and #R305H170005 from the U.S. Department of Education's Institute of Education Sciences (IES)

For Articles, Preprints, Research Briefs, and Summaries of the Portland and Utah Studies:

https://jensteele1.github.io/research/dual_language