Abstract Title Page
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Title: How Do Changes in the Language of Instruction and Classroom Composition Affect English Learners?

Authors and Affiliations: Maria Perez & Alec Kennedy, University of Washington

Abstract Body

Limit 4 pages single-spaced.

Background / Context:

Description of prior research and its intellectual context.

The number of students that live in families where a language other than English is spoken has risen relative to the English-only households in the United States over the last 25 years. These students face the dual challenge of mastering English while acquiring academic skills and knowledge.

The education of these students has been shaped by several national- and state- level legal decisions of the past that have required schools to take action by providing services to help linguistic minority students overcome language barriers that impede their equal participation. Those services most often take the form of either an "English-immersion" approach, in which students receive all instruction in English, or employ a "bilingual model" where students are initially taught in some combination of English and their native language and eventually transfer to English-only classrooms. The question of which model of instruction is more "effective" has been notoriously difficult to answer and remains an open and controversial debate.

The literature is not conclusive with respect to which instructional program better serves the needs of English learners. This may be in part due to the fact that of the hundreds of small-scale studies that have been conducted to date, very few statistically account for the problems of selection into bilingual education. Rossell & Baker (1996) conducted a meta-analysis of 300 evaluation studies and found that only 25 percent of them used an acceptable methodology (i.e., they had a treatment and control group and appropriately controlled for pre-treatment differences across groups). Slavin & Cheung (2005), in a synthesis of the research also find similar methodological issues, with many of these studies lacking appropriate comparison groups or involving treatment durations of less than one year.

A number of recent studies have used either experimental or quasi-experimental research designs to overcome the issues mentioned above and measure the causal link between language of instruction and academic performance (Slavin et al, 2011; Matsudaira, 2005; Chin, Daysal, & Imberman, 2011). While these studies have focused on the evaluation of different instructional programs to educate English Learners (ELs), the major focus has been on how differences in the language of instruction affect the academic achievement of ELs, rather than understanding the mechanisms through which peers and classroom composition could affect their outcomes. The literature on peer composition has played an important role in policy debates concerning ability tracking, school desegregation, and affirmative action programs, but has not been an important aspect of the program evaluation literature on instructional programs for English learners.[1] This study seeks to fill in this gap by showing that the composition of the class is an important aspect that should be taken into consideration when analyzing the effects of different instructional programs for ELs.

Purpose / Objective / Research Question / Focus of Study:

Description of the focus of the research.

[1] This literature dates back to the Coleman Report and has been plagued by identification and measurement issues. Most recent and rigorous studies have found positive peer effects on achievement growth (e.g. Hanushek et al. (2003), Hoxby (2000), Sacerdote (2001), and Ding & Lehrer (2006)).

In this article we take advantage of a policy passed in California that changed the default instructional program for ELs (described later). Prior to 1998, most ELs were placed into bilingual education. This state-level legislation forced schools to move students to move to a different instructional setting –a change that would not had been chosen otherwise—providing a natural experiment opportunity to evaluate the effect of bilingual education versus English immersion on the academic achievement of ELs. We also analyze how changes in the composition of the classroom affect the academic achievement of students.

Setting:

Description of the research location.

With a very diverse student population, California's educational system provides a good opportunity to study the impact of instructional programs geared towards aiding students to overcome the language barrier. About a quarter of the students enrolled in California's schools are classified as ELs. Our study focuses on the largest school district in California, the Los Angeles Unified School District (LAUSD), where approximately 40% of its students were classified as ELs when Proposition 227 was passed in 1998.

Population / Participants / Subjects:

Description of the participants in the study: who, how many, key features, or characteristics.

We use a LAUSD student-level panel database from 1996-97 through 2001-02 (two years before the passage of the proposition to four years after). We have information on students' test scores (standardized to have mean zero and variance one), instructional programs (for the purpose of this analysis, several programs were grouped together into two main groups: bilingual and English immersion), demographic characteristics, and language classification. This database also includes an identifier for the teacher so that we are able to identify the classroom characteristics/composition that a given student is exposed to over time.

Intervention / Program / Practice:

Description of the intervention, program, or practice, including details of administration and duration.

In this study we analyze how different instructional settings (bilingual and English immersion) affect the academic achievement of ELs, by taking into consideration the changes in the composition of the classroom. We use Proposition 227 as a natural experiment.[2] This proposition was passed in June of 1998, mandating that beginning in the school year 1998-99, all ELs in California are to be placed in structured English immersion for a period "not normally intended to exceed one year", then be transferred to mainstream classrooms taught overwhelmingly in English. As a result, this proposition significantly altered the ways in which the state's ELs were to be taught.

It should be noted that the compliance with the proposition was very high. This is evidenced by the sharp decline in the enrollment of Spanish ELs in bilingual programs (Figure 1). One possible factor could be the strong language used in the proposition regarding the failure to comply with the implementation of the law. The law states that any elected official, public school teacher or administrator, who willfully and repeatedly refuses to implement the terms of the law, "may be held personally liable for fees and actual damages by the child's parents or legal guardian." It is important to point out that the reason why bilingual education enrollment did not fall to zero after the passage of the proposition is the parental waiver exception provision.

[2] Full text of Proposition 227 can be found here: http://primary98.sos.ca.gov/VoterGuide/Propositions/227text.htm

This provision allows parents to request bilingual education for their children with the approval of both the teacher and principal. In our identification strategy we take into account the fact that the change in the percentage of students enrolled in bilingual education is likely to be endogenous.

(please insert figure 1 here)

Research Design:

Description of the research design.

We exploit the sharpness of the change in bilingual education enrollment in the year the proposition was passed for our identification strategy. Our main assumption is that with the passage of the proposition schools were forced to make large changes in the share of ELs enrolled in bilingual education and that no other large change occurred in these schools that could be correlated with the share of ELs in bilingual education during this time. However, we need to take into account the fact that the change in bilingual enrollment is not completely exogenous. For example, some schools could have reacted to the ban by poorly implementing English immersion programs, or not eliminating bilingual education by seeking parental waivers. To remedy this issue we use an instrumental variables technique (with mechanical implementation of the policy as an instrument). We regress the change in academic achievement (English and Math) for both ELs and native English speakers (EOs), before and after the passage of the proposition, as a function of the instrumented change in the share of ELs enrolled in bilingual education at the school-level.

Data Collection and Analysis:

Description of the methods for collecting and analyzing data.

As previously described, we use administrative student-level panel data collected by LAUSD. We focus on the change in students' academic achievement between 1997-98 and 1999-00.[3] Formally: We estimate our models within schools. In addition, in order to take into account the non-random sorting of teachers into classrooms, in some specifications we incorporate teachers' fixed effects.

$$\Delta Y_{i,s,c}^{sub,g,l} = \beta_1^{sub,g,l} \Delta\widehat{\%Bil}_s + X_s\lambda + X_c\gamma + \varepsilon_{i,s,c} \quad (1)$$

Where the $\Delta Y_{i,s,c}^{sub,g,l}$ represents the change in academic achievement for student *i*, in school *s*, and classroom *c*. We estimate this model for English and Math standardized test scores (*sub*), across different grade levels (*g*) as well as separately for ELs and EOs (*l*). $\Delta\%Bil_s$ represents the instrumented change in the share of ELs in bilingual education in school *s* (this is our measure of the extent that a school implements Proposition 227, a negative value indicates that a smaller percentage of ELs were placed into bilingual education after the passage of Proposition 227 compared to before). We estimate this model with observable school and classroom controls (X_s *and* X_c, respectively). We also run specifications with school or classroom fixed effects.

In addition, we incorporate a measure of the change in exposure of ELs to native English speakers ($\Delta\%EO$) in the classroom, as well as an interaction between our treatment and this exposure measure. Formally:

[3] We also estimate the change in academic achievement between 1997-98 and 1998-99, 1997-98 and 2000-01, as well as 1997-98 and 2001-02.

$$\Delta Y_{i,s,c}^{sub,g,l} = \beta_1^{sub,g,l}\Delta\widehat{\%Bil}_s + \beta_2^{sub,g,l}\Delta\%EO_{s,c} + \beta_3^{sub,g,l}(\Delta\%EO_s * \Delta\widehat{\%Bil}_{s,c}) + X_s\lambda + X_c\gamma + \varepsilon_{i,s,c} \quad (2)$$

Findings / Results:

Description of the main findings with specific details.

Tables 1-4 summarize our main findings. We present the results for the change between 97-1998 and 1999-00 school years, although our results are robust to different time periods. Across all these tables, column (1) shows OLS results without any controls. Column (2) presents our 2SLS estimates without any controls as well. Columns (3) – (5) show our 2SLS results of Equation (1) with and without school and classroom controls (or fixed effects). Columns (6) – (8) show the results of Equation (2) estimated by 2SLS as well (with and without controls/fixed effects).

The first panel in Table 1 presents EL math achievement results for a pooled regression for grades 2-3, grades 4-6 are shown in the second panel. We find little effect of the proposition on earlier grades on math results once we control for class and school characteristics. We, however, find that EL students in grades 4-6 experience declines in math scores as a result of the switch from Bilingual to English immersion after controlling for class and school characteristics as well as the change in the share of EOs in the classroom (remember a negative $\Delta\%Bil_s$ variable is what would be observed in most schools after Proposition 227). We also generally see a beneficial effect of placing ELs into classrooms with more EOs on their math scores. Interpreting the coefficients on the interaction terms, we find that EL math scores rose after the switch from bilingual to English immersion when that was combined with an increased number of EOs in the classroom (though this effect is generally insignificant).

Table 2 shows reading results for ELs. We find a small positive effect on grades 2-3. We also find that while increasing the percentage of EOs in the classroom helps; it does not help when combined with a change in educational program. The reading scores for ELs in grades 4-6 decreased after the passage of the proposition. While we see an increase in reading scores after an increase in the percentage of EOs in the classroom, we do not see that same increase when it is combined with a policy like Prop 227 that moves ELs from bilingual to immersion programs (except for specification (7)).

(please insert Tables 1-4 here)

Table 3 displays the results for native English speakers (EO) math results. Generally, we find that EO students benefited in schools where there was a switch from bilingual education to immersion and an associated decrease in the number of EOs in their classroom (this is our interpretation of the coefficients on the interaction terms in the models). Reading test scores for EOs, presented in Table 4, also exhibited similar trends as math scores (although not always significant depending on the specification).

Conclusions:

Description of conclusions, recommendations, and limitations based on findings.

In summary, we find that the achievement scores of ELs declined by the switch from bilingual education to English immersion programs, with the exception of grades 2-3 reading scores. We also find that there is a beneficial effect of placing ELs into classrooms with more native English speakers. We also find that EOs were also affected by the implementation of Proposition 227. We find that EO students generally benefited from a school's decision to switch EL students from bilingual education to immersion in combination with a decrease in the number of other EOs in their classroom.

Appendices

Not included in page count.

Appendix A. References

References are to be in APA version 6 format.

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Slavin, R.E., & Cheung, A. (2005). A Synthesis of Research on Language Reading Instruction for English Language Learners. *Review of Educational Research*, 75(2), 247-284.

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Appendix B. Tables and Figures

Not included in page count.

Figure 1

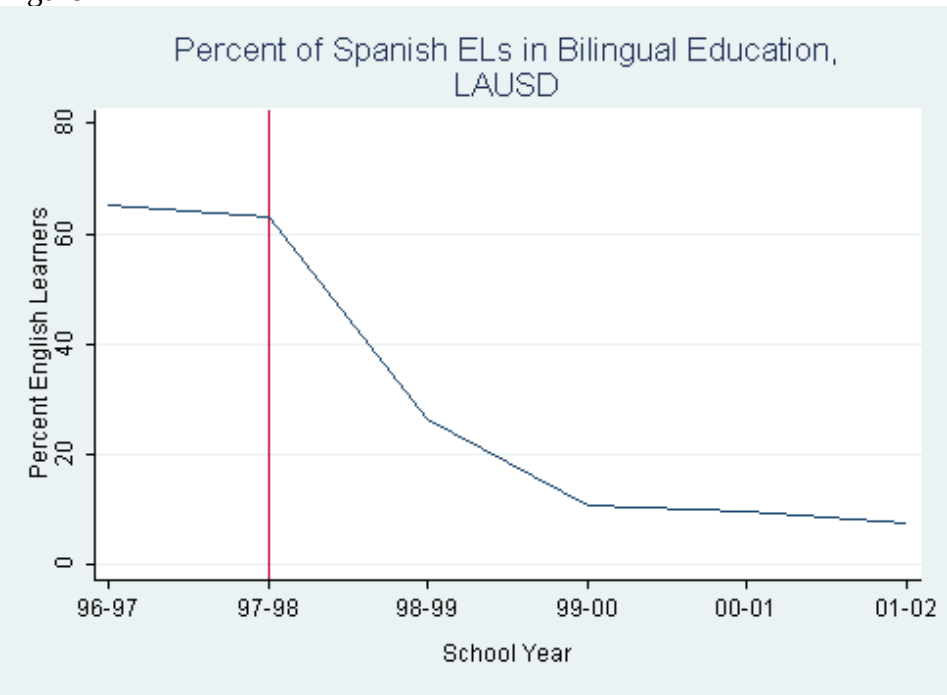

Table 1: Regression Results for Math Scores (EL students)

English Learners

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		No-IV	**w/ IV**	**w/ IV**	**w/ IV**	**w/ IV**	**w/ IV**	**w/ IV**	**w/ IV**
Grade 2-3	% Bil	-0.001***	-0.002***	0	0	0.001	0	0	0
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	% EO						0.001	0	0
							(0.00)	(0.00)	(0.00)
	% Bil * % EO						0	-0.002	0
							(0.00)	(0.00)	(0.00)
	Class ctrls			x		x	x		x
	School ctrls			x	x		x	x	
	Class FE				x			x	
	School FE					x			x
	N	95785	95785	95785	95036	95784	95785	95036	95784

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		No-IV	**w/ IV**	**w/ IV**	**w/ IV**	**w/ IV**	**w/ IV**	**w/ IV**	**w/ IV**
Grade 4-6	% Bil	0	-0.001**	0.001*	0.002***	0.003***	0.001***	0.002***	0.003***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	% EO						0.002**	0.001	0
							(0.00)	(0.00)	(0.00)
	% Bil * % EO						-0.002	-0.004**	-0.001
							(0.00)	(0.00)	(0.00)
	Class ctrls			x		x	x		x
	School ctrls			x	x		x	x	
	Class FE				x			x	
	School FE					x			x
	N	68661	68661	68661	68174	68657	68661	68174	68657

Table 2: Regression Results for Reading Scores (EL students)

English Learners

		(1) **No-IV**	(2) **w/ IV**	(3) **w/ IV**	(4) **w/ IV**	(5) **w/ IV**	(6) **w/ IV**	(7) **w/ IV**	(8) **w/ IV**
Grade 2-3	% Bil	-0.004***	-0.005***	-0.002***	-0.001	0	-0.001***	-0.001	0
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	% EO						0.003***	0	0.002***
							(0.00)	(0.00)	(0.00)
	% Bil * % EO						0.005***	0.002*	0.005***
							(0.00)	(0.00)	(0.00)
	Class ctrls			x		x	x		x
	School ctrls			x	x		x	x	
	Class FE				x			x	
	School FE					x			x
	N	87056	87056	87056	86267	87054	87056	86267	87054

		(1) **No-IV**	(2) **w/ IV**	(3) **w/ IV**	(4) **w/ IV**	(5) **w/ IV**	(6) **w/ IV**	(7) **w/ IV**	(8) **w/ IV**
Grade 4-6	% Bil	-0.001***	-0.002***	0.001**	0.002***	0.003***	0.001***	0.002***	0.003***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	% EO						0.003***	0.002**	0.002***
							(0.00)	(0.00)	(0.00)
	% Bil * % EO						0	-0.004**	0
							(0.00)	(0.00)	(0.00)
	Class ctrls			x		x	x		x
	School ctrls			x	x		x	x	
	Class FE				x			x	
	School FE					x			x
	N	65340	65340	65340	64845	65336	65340	64845	65336

Table 3: Regression Results for Math Scores (EO students)

English-Only

		(1) **No-IV**	(2) **w/ IV**	(3) **w/ IV**	(4) **w/ IV**	(5) **w/ IV**	(6) **w/ IV**	(7) **w/ IV**	(8) **w/ IV**
Grade 2-3	% Bil	-0.014***	-0.014***	-0.001***	0	0	-0.001**	-0.001	-0.001*
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	% EO						0.001***	0	-0.001*
							(0.00)	(0.00)	(0.00)
	% Bil * % EO						0	0.001	0.002**
							(0.00)	(0.00)	(0.00)
	Class ctrls			x		x	x		x
	School ctrls			x	x		x	x	
	Class FE				x			x	
	School FE					x			x
	N	66339	66339	66339	65496	66339	66339	65496	66339

		(1) **No-IV**	(2) **w/ IV**	(3) **w/ IV**	(4) **w/ IV**	(5) **w/ IV**	(6) **w/ IV**	(7) **w/ IV**	(8) **w/ IV**
Grade 4-6	% Bil	-0.014***	-0.014***	-0.002***	-0.001**	-0.001*	-0.002***	-0.002**	-0.002***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	% EO						-0.001	-0.001	-0.003***
							(0.00)	(0.00)	(0.00)
	% Bil * % EO						0.001	0.002	0.003**
							(0.00)	(0.00)	(0.00)
	Class ctrls			x		x	x		x
	School ctrls			x	x		x	x	
	Class FE				x			x	
	School FE					x			x
	N	60761	60761	60761	60191	60761	60761	60191	60761

Figure 4: Regression Results for Reading Scores (EO students)

English-Only

		(1) **No-IV**	(2) **w/ IV**	(3) **w/ IV**	(4) **w/ IV**	(5) **w/ IV**	(6) **w/ IV**	(7) **w/ IV**	(8) **w/ IV**
Grade 2-3	% Bil	-0.015***	-0.015***	-0.001***	-0.001	0	-0.001**	-0.001	-0.001**
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	% EO						0.002***	0.001	0
							(0.00)	(0.00)	(0.00)
	% Bil * % EO						0	0	0.003**
							(0.00)	(0.00)	(0.00)
	Class ctrls			x		x	x		x
	School ctrls			x	x		x	x	
	Class FE				x			x	
	School FE					x			x
	N	64171	64171	64171	63341	64171	64171	63341	64171

		(1) **No-IV**	(2) **w/ IV**	(3) **w/ IV**	(4) **w/ IV**	(5) **w/ IV**	(6) **w/ IV**	(7) **w/ IV**	(8) **w/ IV**
Grade 4-6	% Bil	-0.016***	-0.016***	-0.002***	-0.001**	-0.001**	-0.002***	-0.002**	-0.002**
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	% EO						-0.001	0	-0.002**
							(0.00)	(0.00)	(0.00)
	% Bil * % EO						0	0.001	0.002
							(0.00)	(0.00)	(0.00)
	Class ctrls			x		x	x		x
	School ctrls			x	x		x	x	
	Class FE				x			x	
	School FE					x			x
	N	59700	59700	59700	59109	59700	59700	59109	59700