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Dual Language Program Expansion and Dispersion in the Context of Neighborhood Change, School Choice, and Enrollment Decline

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Purpose. Bilingual programs in the United States, particularly two-way dual language immersion (TWDL) programs, have been implemented since the 1960s to support the education of English Learner-classified (EL-classified) and language minoritized students. Over the past decade, TWDL programs have grown significantly across the United States. This study examines TWDL program growth in Los Angeles Unified School District, exploring the relationships between program expansion and neighborhood change, enrollment declines, and school choice. These factors have been linked to decreased access to these programs for language minoritized students. Research Methods/Approach. We descriptively examine the neighborhood characteristics of TWDL schools over a 22-year period using publicly available school, census, and housing data, and investigate the relationship between these factors and TWDL emergence. Findings. We find that of the three factors we explored, enrollment change (specifically declining enrollment) and the existence of nearby charter schools are two factors most likely to be associated with TWDL program emergence. We find little evidence that TWDL are primarily emerging in gentrifying contexts. Implications. This study helps us understand general, decade-long trends of TWDL program expansion and dispersion in a district undergoing many of the phenomena described in the literature on this topic.

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Examining Dual Language Program Expansion and Dispersion in the Context of Neighborhood Change, School Choice, and Enrollment Declines

Since the 1960's, bilingual programs in the United States have supported the education of English Learner-classified (EL-classified) and language minoritized students in an effort to combat their exclusion from mainstream education (Valentino and Reardon 2015). Two-way dual language immersion (henceforth TWDL), a type of bilingual education program that maintains and develops both English and a partner language, is specifically designed to integrate students from diverse language, culture, and race backgrounds in a culturally-relevant way (C. G. Cervantes-Soon et al. 2017b; R. D. Freeman 1998).[i] A small, but rigorous, body of research suggests students enrolled in TWDL have higher average test scores (Steele et al. 2017; Bibler 2021), increased cross-cultural awareness (Bearse and de Jong 2008; Lindholm-Leary 2011), while developing bilingualism and biliteracy (Watzinger-Tharp et al. 2018; Burkhauser et al. 2016). [ii] Over the past decade, TWDL programs have grown dramatically. Present in 39 U.S. states and the District of Columbia (C. Cervantes-Soon et al. 2021), a recent survey identified some 3,600 programs across the country, with California, Utah, Texas, North Carolina and New York comprising nearly 60% of all programs (American Councils for International Education 2021).

TWDL seeks to increase academic achievement, bilingualism and biculturalism, and sociocultural competence through purposeful integration. This key feature demands that groups of children from different linguistic (and often also racial, ethnic, and socioeconomic) backgrounds be placed in the same classroom and given instruction in a language that one group already speaks or can understand, and the other group is only beginning to learn.[iii] Given that most schools, and especially elementary schools, enroll students primarily from the surrounding neighborhood, whether and how this purposeful integration works will depend on who lives in the area. While

not the only factor, issues around physical access to TWDL will have profound implications for whether these programs are able to fulfill their social justice and equity mission for linguistic minority and other disadvantaged children (Valdez et al. 2016; Chaparro 2017; García-Mateus et al. 2020; C. G. Cervantes-Soon et al. 2017b).

Districts consider educational factors (such as providing culturally relevant pedagogy to EL-classified students and supporting their learning by using their home language) when deciding whether and where to open a TWDL program. But other factors are also at play. Scholars have shown that TWDL programs are more likely to open in neighborhoods undergoing economic and demographic change resulting from gentrification, experiencing competition as a result of charter expansion, and/or declining enrollment (or a combination thereof) (S. E. Chaparro 2021a; Bernstein et al. 2021; Burns 2017; Duarte 2022; Kim 2022). They have found that these programs emerge strategically in neighborhoods with greater proximity to white, middle-class families—who are perceived to bring more resources to school. Before we can understand whether TWDL can accomplish its goals for traditionally underserved students, it is important to examine if these populations are located within physical proximity to TWDL schools.

In this study we use a novel and rich longitudinal data set to descriptively examine whether TWDL program growth in Los Angeles Unified (LAUSD) is related to three key forces affecting public schools in urban areas: neighborhood change (or "gentrification"), enrollment declines, and the expansion of school choice. The literature on TWDL program growth, most of it using qualitative research or case-study designs, finds that TWDL programs are increasingly being opened in neighborhoods with growing populations of white, middle-class residents, while Latinx and Black neighborhoods are overlooked (see for example Valdez et al. 2016). We find that TWDL programs in Los Angeles Unified are expanding in a wide variety of neighborhood contexts,

including, but certainly not limited to, neighborhoods that are exhibiting signs of socio-economic change (i.e., "gentrifying" neighborhoods) but also those with high proportions of Latinx and Black/African American and Asian-American residents. Neighborhoods with recently opened TWDL programs also exhibited common attributes documented in the literature: enrollment declines and growing numbers of charter schools, suggesting that regardless of neighborhood shifts, TWDL is appearing in areas of increased competition for student enrollment.

Study Aims and Research Questions

Examining TWDL program expansion and dispersion within the contexts of neighborhoods is a crucial first step in understanding how policy decisions impact who accesses –and eventually benefits-- from TWDL programs.[iv] In this study we systematically explore TWDL program growth in Los Angeles Unified School District (LAUSD) between 2000 and 2022 alongside three forces: neighborhood change, enrollment, and school choice. In addition, we explore how these trends may have changed in response to a state policy change enacted in 2016 (and implemented the following year), known as Proposition 58, which lifted restrictions on EL-classified students' access to bilingual education programs. The following research questions address each of the three forces and guide analysis:

(1) What are the characteristics of neighborhoods with and without TWDL programs? How have these changed over time?

(2) What are public school enrollment patterns of neighborhoods serving TWDL schools and is enrollment significantly associated to program emergence? How do these trends/patterns vary before and after passage of Proposition 58?

(3) What is the dispersion of charter schools across neighborhoods serving TWDL schools and is the presence of charter schools significantly associated to program emergence? How do these trends/patterns vary before and after passage of Proposition 58?

To answer these questions, we analyze 22 years of data between 2000 and 2022. We focus on *elementary* TWDL schools as they constitute most TWDL schools in LAUSD and are typically first to open in response to district and state policy, compared to middle and high schools. We use census tracts and zip codes as proxies for a neighborhood, with cities as additional checks. We examine neighborhood-level home prices, neighborhood demographic characteristics by race and ethnicity, enrollment trends, and charter school dispersion. We find that of the three factors, declining enrollment and charter school count are most likely to be associated with TWDL emergence, with little evidence of TWDL primarily emerging in gentrifying contexts.

We examine patterns in TWDL growth using novel and rich data along visual evidence. We also provide correlational analyses that establish the significance between these forces and TWDL emergence. Though our paper is descriptive and our findings cannot be interpreted causally, this is one of a handful of studies that empirically examine TWDL programs using longitudinal, large-scale data and can establish statistical patterns across all schools. Other examples include Valdez and colleagues (2016) study of Utah's TWDL school growth using school level data, and an examination of program dispersion across Chicago neighborhoods (Domínguez-Fret and Oberto 2022).

Conceptual Framework and Relevant Literature

The three goals of TWDL programs are sometimes referred to as "pillars" of TWDL: academic achievement, bilingualism and biliteracy, and sociocultural competence (Howard et al.

2007). Some scholars add a fourth goal or pillar: fostering student and teacher critical consciousness (Palmer et al. 2020; Heiman and Yanes 2018). To achieve these goals, TWDL enrolls students who already speak or have some command of the partner language alongside English-only students, requiring integration not only along linguistic, but also economic, racial/ethnic, and social lines. Due to the legacy of linguistic assimilation, immigration policy, and economic inequality in the United States, linguistic minority students –who speak a language other than English at home— may also be students of color, come from low-income families, and be the children of immigrants who themselves have lower levels of educational attainment (Park et al. 2017). Thus, students with potentially different, and often contrasting, agendas must learn together. For many English-speaking students with no background in the partner language, TWDL is often seen as an enrichment program that provides an advantage in a highly competitive world. Many partner language speakers also want this enrichment, and they may also see TWDL as a way to combat their exclusion from mainstream education through curriculum and instruction that builds on their assets and equalizes power dynamics inside the classroom (Freeman 1996). In her much cited "cautionary note," however, Guadalupe Valdés (1997) argued that the negotiation of potentially conflicting agendas in TWDL could result in fewer benefits to linguistic minority students. By watering-down the language content and demands of TWDL programs to cater to partner language "beginners," the more proficient students could be getting shortchanged (Valdés 1996). Because of this, TWDL programs must place close attention to matters of equity inside the school and ensure that all children, particularly minoritized and low-income children, are afforded the same opportunity to learn from dual language instruction.

The dynamics that occur inside TWDL programs mirror the inequities and power imbalances shaping the neighborhoods they are in. The school-neighborhood link is strong in our

public school system, as most elementary-aged students attend a school close to where they live (Hao 2007; United States Census Bureau 2015). This is especially true for EL-classified students, who more likely to enroll in their neighborhood school (Mavrogordato and Harris 2017). Thus, placement of TWDL will impact who reasonably has access to them. As previously mentioned, three factors may affect where programs get placed: neighborhood change that brings into the neighborhood families with more resources (also referred to "gentrification"), school choice, and enrollment declines. The tension in these forces has implications for TWDL in how much they can prioritize their equity mission..

How Neighborhoods, Enrollment, and School Choice Affect TWDL Program Placement

The founding of a TWDL program, or any school program for that matter, can be seen as the result of district policy (reflecting district interests, priorities, and pressures) and parent demand (reflecting parent choices and priorities) (Lubienski et al. 2009). District interests and priorities may trickle down from state level policies, as was the case in California following state initiatives to increase bilingual offerings in schools (California Department of Education 2018). Parents may also have personal and professional interests in TWDL, and may lobby their districts and schools to open and maintain these programs (Linton 2007). With the expansion of choice, a larger share of parents can now 'vote with their feet'. For example, Chaparro (2021) Menken et al. (2023), and Dorner et al., (2021) found that white middle-class parents held considerable leverage of choice to convince schools to open a TWDL program in their local neighborhood school. Finally, enrollment change – and specifically enrollment decline - caused either by general demographic shifts, or by school choice and parent preferences will affect district policy because enrollment is often tied to school funding and resources. Taken together, these interacting forces of district and parent priorities alongside neighborhood change like gentrification, enrollment decline and school choice

expansion may push districts to develop strategies that make improvements or changes to educational options in order to attract and keep students (Hoxby 2003; Jabbar 2015). In other words, as much as districts may want to follow mostly educational or district priorities when founding programs, they must also contend with outside forces which mediate their decisions (Jabbar 2015).

School Choice

School choice has dramatically expanded in recent years, through the growth of charter schools, open enrollment, and intra/inter district transfer policies. Research suggests that school choice options exist in a wide array of contexts, including gentrifying and non-gentrifying neighborhoods. In turn, this has led to increased school sorting along racial and socioeconomic lines (Kotok et al. 2017). Some studies have focused on gentrifying neighborhoods and found that white, high SES parents opt out of their neighborhood schools and choose those with higher concentrations of white, higher SES students (Schachner 2022; Pearman 2020; Pearman and Swain 2017). In Chaparro's (2021a) study, for example, gentrifying parents leveraged their ability to opt out of the neighborhood school to open a TWDL program. Simultaneously, school choice also exists in Black/African American and Latinx neighborhoods, with parents choosing schools that largely resemble (at least racially and socioeconomically) their neighborhood counterparts. Regardless of where choice is occurring, the resulting competitive, 'arms-race'-like environment means that the placement of schools with TWDL programs may be governed by schools' necessity to differentiate themselves from one another, but especially from nearby charter schools (Duarte 2022). In a Texas-based study, district administrators expanded a neighborhood school's TWDL program in direct response to increased competition from nearby charter school expansion (Duarte

2022). Bernstein et al.'s (2020) multi-state study also found that school choice and enrollment concerns prompted schools to open TWDL programs.

Neighborhood Change

Gentrifying neighborhoods are characterized by an influx of white and/or more middle-class and upper-middle class families. When this happens, these parents tend not to enroll their children in the local public school but instead in school choice alternatives (Mordechay and Ayscue 2020). Delavan et al. (2017; 2016) first documented the growth of TWDL statewide using school-level enrollment data and found that programs were increasingly opening in schools that had larger proportions of white, fewer poor, and fewer EL-classified students. They called this the '*gentrification of dual language*' and warned of the lack of minoritized student access to newly founded programs by highlighting the importance of program placement. One study based in Texas found that a district rapidly expanded TWDL offerings but placed them in schools located in neighborhoods with increasing populations of white, middle-class residents, while Latinx and Black neighborhoods went overlooked (Wall et al. 2022). TWDL acting as neighborhood 'magnet' programs for predominantly white, middle class parents in diverse but increasingly exclusive neighborhoods was found in Philadelphia (Chaparro 2021b), the western United States (Burns 2017), central Texas (Heiman and Murakami 2019), New York City (Kim 2022), Chicago (Domínguez-Fret and Oberto 2022), and the Los Angeles area (Morales and Maravilla 2019). Though these studies were not universally clear as to *when* this occurred in relation to TWDL founding, they all highlighted that communities undergoing population shifts, specifically white gentrifying neighborhoods, seem to provide a favorable environment for TWDL founding and expansion, with linguistically minoritized communities becoming increasingly out of reach of these schools.

Enrollment Changes

District decisions to found TWDL as a kind of "magnet" to compete for students when faced with enrollment pressures may not necessarily engineer enrollments toward more affluent, white middle-class populations. Districts may also want to open programs to counter declining enrollments caused by demographic shifts, or by poor school performance. Nation-wide, the population of elementary-aged children has decreased since its peak of 25 million in the year 2000, to a current total of 24.3 million in 2022 (Heiman and Murakami 2019). 'White flight' throughout the mid to late 20th century saw enrollment declines concentrated in urban schools as middle-class, predominantly white families 'fled' from diverse urban cores to the suburbs (Clotfelter 2001). Public school enrollments in major cities thus declined between the 1960s and 1990s while a similar pattern of Black student enrollment decline in urban public schools has been documented since the 2000s with subsequent enrollment increases in suburban schools (Billingham 2019; Ornstein 1989). [v]

In Texas, Well et al. (2019) found that enrollment declines located within changing, gentrifying neighborhoods became prime candidates for housing TWDL programs. This was done to reverse the course of declining enrollment from families opting out of their neighborhood school. In Colorado (Pearson et al. 2015), the documented TWDL program was founded in a school undergoing decreased enrollment, to serve the increasing Latinx population in need of language services, and attracted predominantly those students to the school, with a marked exodus of white, middle-class residents. Both groups exercised choice, but one group exercised it 'in' while the other did so 'out', with the result that the dual language program served a predominantly Spanish-speaking, lower-income, and bilingual population of students. In Bernstein et al.'s multi-state study, the authors found that in some instances schools converted pre-existing bilingual

programs to TWDL to attract prospective parents, while in others, schools selected TWDL 'almost at random…from several possible 'choice programs' (2021, 16). Districts may also open TWDL programs as a way to "turnaround" low-enrolled schools, as Menken et al. (2023), found in a low-performing New York City TWDL school, which nearly doubled its enrollment after founding a TWDL program.

The Context: Los Angeles Unified

In the 1960s and 70s, California (and many states around the nation) greatly expanded bilingual education options as part of a trend emerging from the Civil Rights and the Lau v. Nichols Supreme Court decision era.[vi] LAUSD was the recipient of a considerable number of federal and state grants to open bilingual programs in working class, Latinx neighborhoods (mainly concentrated around East LA). The Bilingual Education Act of 1968 saw bilingualism as a remediation strategy and was thus initially limited to EL-classified, low-income students (García and Sung 2018). Nationwide, backlash against bilingual education, however, grew in the following decades, culminating in the passage of Proposition 227 in California in 1998. Proposition 227 severely restricted bilingual programs in public school and led to drastic reductions in the number of EL-classified children enrolled in such programs after 1998.[vii] Similar legislation passed in Arizona and Massachusetts shortly thereafter.

TWDL programs, however, continued to enjoy some support because they were considered enrichment programs serving both EL-classified and low-income students, and English-only and non-low-income students. Moreover, they continued to have access to federal funding with the reauthorization of Title VII of the Elementary and Secondary Education Act in 1994 (Dixon 2016). Some TWDL programs re-designated themselves as magnet or charter programs to avoid state regulation altogether (Linton 2007; Stirikus & Garcia 2000). In 2017, voters in California passed

Proposition 58 reversing the restrictions imposed on bilingual education for EL- classified students and greatly increasing the number of these programs across the state. [viii]

LAUSD and TWDL Education

LAUSD is the second largest school district in the country and serves the largest number of EL-classified children in the nation. Los Angeles County, where LAUSD resides, has a long history of exclusionary housing policies, white flight, and school choice expansion. All of this makes LAUSD an important case for studying language-related policy.

The first TWDL program in LAUSD opened in 1992. Even during a time of restrictive language policies, the district's office of multilingual education set aside federal funds to develop TWDL programs (Linton 2007). By 2004-2005, there were a total of 13 TWDL programs in the district and by 2022 there were 146. These 146 TWDL programs make up the vast majority of all bilingual programs (96%), the others comprising of one-way immersion (3.9%) and world-language programs (1.9%). In this paper, we focus only on TWDL elementary programs. Programming in these programs is offered in several partner languages with Spanish (86.9% of programs), Korean (4.8%) and Mandarin (3.4%) being the three most common. Other languages offered include German, Armenian, French, Arabic, and Japanese (see Table A1 of the Online Appendix for a breakdown of program by language).

The passage of Proposition 58 in California accelerated an already growing trend in the numbers of TWDL programs in LAUSD (see Figure 1) through two mechanisms. First, it lowered the barrier to entry to TWDL by removing the parental waiver required for EL-classified students under Proposition 227. Second, it expanded monetary incentives to districts opening TWDL programs (Article 11- Pathways to Success Grant Program 2019). By removing barriers to entry,

Proposition 58 opened up TWDL to communities that did not have a sizable proportion of heritage language speakers or who had not gathered enough support in the past to request a waiver.

[INSERT FIGURE 1 HERE]

Enrollment, Neighborhoods and Expansion of School Choice

In addition to important shifts in language policy, LAUSD has undergone significant enrollment and demographic changes over time. In the 1980s, enrollment in LAUSD experienced significant declines resulting from white flight. Enrollment has again been declining in the district over the past ten years as the general school-aged population drops.[ix] Additionally, since 2001 the district has experienced a dramatic increase in the number of charter schools and charter school enrollments. TWDL enrollment, however, has not dropped. One New York Times article (Medina 2016) suggests that the district may have explicitly used TWDL to help curb enrollment declines that occurred either through demographic change or shifts to charter schools. The growth in TWDL programs since the passage of Proposition 58 (in 2016) has been dramatic. In fact, as of 2022, close to half of elementary TWDL education programs in LAUSD have only been open for two years and two-thirds of elementary TWDL programs have been open for four years or less (see Figure 2).

[INSERT FIGURE 2 HERE]

Some Los Angeles neighborhoods also experienced significant urban renewal and change since the 2000s (Urban Displacement Project 2018). Table 1 shows the demographic and socioeconomic shifts across all neighborhoods serving elementary schools in LAUSD at four time points. Since 2000, neighborhoods in which elementary schools are located experienced a relatively stable Asian-American population, and a decreasing non-Latinx Black/African

American and white resident population. On the other hand, these elementary school neighborhoods have seen an increase in the Latinx population by about five percentage points – from 50% to 56% -, and a dramatic increase in home prices. The average home price increased from about 560,000 dollars in 2005 to about 770,000 dollars in 2020, adjusted for inflation. Similarly, the percentage change in ZHVI from the prior year averaged seven percentage points in 2020.

[INSERT TABLE 1 HERE]

Data & Methods

To understand whether TWDL schools operate in communities of residents historically marginalized in enrichment programs like TWDL, we explore TWDL schools' neighborhoods across 22 years between 2000 to 2022. Elementary TWDL school designation, instructional model, language of program, and founding year were obtained from publicly available district directories of bilingual education schools ("Directory of Programs" 2021). Enrollment numbers and geocoordinates for each school and year were obtained from the California Department of Education (CDE). We use the founding year to create a binary variable that takes the value of 1 the year a neighborhood (designated by either its census tract or zip code) contains a school that becomes designated as TWDL, and a 0 otherwise. We calculate the total enrollment for neighborhood levels (census tract and zip code). We also calculate the percent enrollment change.

Our primary proxies of a neighborhood are the zip code and census tract, with an additional check of charter schools using cities. Zip codes are designed by the US Postal Service for efficient mail delivery and contain on average 30,000 residents. They are more conceptual than geographic (Krieger et al., 2002), suggesting that they align more closely with people's understanding of a neighborhood. Though not as common as tracts, zip codes have been used to explore neighborhood

change over time (City of Los Angeles GeoHub 2021). They are of particular importance to charter schools, which do not have traditional attendance zone boundaries but often use zip codes as their catchment neighborhood (A City Charter School 2017; Alliance College-Ready Public Schools 2019). We use zip-code level data from Zillow (Zillow, Inc. 2022) known as the Zillow Home Value Index (ZHVI). ZHVI is an openly accessible, seasonally adjusted measure of the typical home value in the 35th to 65th percentile range, calculated from about 100 million homes in the US (starting mid-2005). The ZHVI is provided monthly, so we calculate a yearly average for each year in our panel. We also calculate the percent change each year. Since our school level data set includes each school's geocoordinates, we spatially join these to zip code shapefiles provided by the LA Geohub using the R package sf (City of Los Angeles GeoHub 2021; Pebesma 2018). These zip codes are then matched to those provided in the ZHVI database. The ZHVI is both timely and comprehensive, as it utilizes publicly available data of home sales and valuations. ZHVI values are presented in 2022 inflation adjusted dollars.

The second measure of neighborhood is provided by the Decennial Census at the tract level. The tract is a relatively stable statistical unit of measure developed by the US Census to be homogenous in terms of population characteristics, and typically contains about 4000 residents (U.S. Census Bureau 2020), and often used in studies on demographic change and notably on gentrification (Bhavsar et al. 2020; L. Freeman 2009; Mordechay and Ayscue 2020). We use the decennial census as it provides more reliable measures of population counts across a twenty-year span of time. Specifically, we use tract-level data from the census on the percentage of Latinx and Asian-American, Black/African American, and white residents. It is important to state that our use of census tracts means that some tracts have multiple schools while others are not included if they do not have a school located within them. Nevertheless, the vast majority (about 90%) of tracts

only contain one elementary school, making them ideal as a proxy for a school's immediate neighborhood. Zip codes, as larger units, contain on average four elementary schools.

All data cleaning, merging, analysis, and GIS was performed using the open-source statistical computer program R (R Core Team 2022), with the use of the census Geocoder API (United States Census Bureau 2022) via the *Censusxy* package (Prener 2022) to obtain latitudes and longitudes of schools not already provided by CDE. We used the *CensusAPI* package (Recht 2022) to obtain Decennial data from 2000, 2010 and 2020 vintages. Schools were tied to zip codes by spatially joining their latitudes and longitudes to a shapefile of zip codes using the *sf* package (Pebesma 2018). Finally, we used the *Leaflet* package to visually render maps (Graul 2016).

Methods

To answer Research Question 1, we descriptively examine census tract and zip code level neighborhood economic and demographic data over time. We utilize the Decennial census to obtain reliable population counts by race and ethnicity and calculate the average percentage of each major ethnic and racial category for each census tract that serves an elementary school. We compare census tracts of TWDL schools with those without and do this for all time points. Similarly, we collect economic housing data at the zip code level and calculate the average price of homes by year (it is provided by month), as well as its percentage change for the years 2005 (the first available year) to 2022 of our panel. We calculate the percentage change ZHVI for each year in our sample beginning after 2005. To answer Research Question 2, we perform a descriptive analysis of how enrollment changed in communities that adopted TWDL right before they opened their first TWDL program with those that never adopted TWDL. For this we calculate the average percentage change in enrollment for all years prior to each year. We define communities using census-tract information. As a sensitivity check we also define communities as the neighborhoods

using cities-level information. In addition, we estimate the statistical relationship between enrollment and opening a TWDL program. To do this, we fit a logit model where the dependent variable takes on the value of 0 if the community did not adopt a TWDL program and 1 if the community did adopt a TWDL program.

The key variable of interest x_j is the change in enrollment that community experienced in that year relative to the previous year. We hypothesize, based upon news reports (Medina 2016) and anecdotal evidence, that communities with declining enrollments will be more likely to open TWDL programs than those with more stable enrollments. To test whether this relationship changed prior to the passage of Proposition 58, we include binary year indicators to examine any time trends prior and post-Prop 58. Finally, to answer Research Question 3, we calculate the total number of charter schools within a TWDL neighborhood zip code and city and compare these values with neighborhoods of non-TWDL zip codes across time. We also statistically test the relationship between TWDL emergence and charter school expansion.

Findings

RQ1. What are the characteristics of neighborhoods with and without TWDL programs? How have these changed over time?

In this section we examine neighborhoods of elementary schools served by LAUSD and compare them to neighborhoods (census tracts and zip codes) that do not have TWDL schools. Figure 3 shows comparison lines of TWDL and non-TWDL neighborhood characteristics. The trends over time show that neighborhoods with TWDL schools have experienced a decrease in their Asian-American population, compared to those without TWDL schools. The proportion of Black/African American residents in neighborhoods with and without TWDL schools has decreased over time, reflecting the overall decline in these students attending district schools. By

contrast, neighborhoods with TWDL schools are increasingly Latinx compared to their non-TWDL counterparts – by 2019 for example, the average TWDL neighborhood was nearly 70% Latinx, compared to 14 years before when the average neighborhood of a TWDL school was about 50% Latinx. Similarly, the proportion of non-Latinx white residents in TWDL neighborhoods decreased from a high of about 25% in the early years to about 10% by 2020. These trends suggest that new TWDL programs are not necessarily opening in predominantly or increasingly white neighborhoods, but in fact are opening largely, and increasingly so, in neighborhoods with higher proportions of Latinx residents, and lower proportions of Asian-American and Black/African American residents (see Table A2 in the Online Appendix).

[INSERT FIGURE 3 HERE]

We visualize these differences for neighborhoods across the district in maps shown in Figures 4 through 7, which allow us to examine the dispersion of TWDL schools across neighborhoods. Figure 4 shows that some of the earliest TWDL schools opened in neighborhoods with high proportions of Asian-American students (the areas of darker shading), while subsequent TWDL schools opened in neighborhoods with very low proportions of Asian-American residents (the areas of lighter shading).

[INSERT FIGURE 4 HERE]

By contrast, in Figure 5 we notice that those same initial TWDL programs emerged in neighborhoods with fewer Black/African American residents (areas of lighter shading). By 2022, we see more programs opening in Black-adjacent or located within predominantly Black neighborhoods, though these are few in number.

[INSERT FIGURE 5 HERE]

Next, we explore the dispersion of programs in the context of the proportion of non-Latinx white residents. The highest concentration of white residents is in the northern and the coastal communities northwest of the district. Scholars have suggested that proximity to neighborhoods with higher proportions of white residents may be a driving factor of TWDL founding (Domínguez-Fret and Oberto 2022). However, as these data and maps show, in LAUSD TWDL programs have predominantly emerged in neighborhoods where white residents are not in the majority (see Figure 6). While it is true that a few schools emerge in areas that between 2000 and 2022 underwent an increase (darker shading) in white resident proportion, most programs opened in neighborhoods where white residents make up 20% or fewer of the residents.

[INSERT FIGURE 6 HERE]

We now examine neighborhoods of TWDL schools with regard to Latinx residents and find the reverse of the trend observed with white and Asian-American residents. Figure 7 shows that the earliest TWDL schools opened in neighborhoods that were Latinx-adjacent but not majority Latinx (in areas of lighter shading). By 2022, many TWDL schools opened in majority Latinx neighborhoods (darker shading) that are not necessarily located within proximity to white neighborhoods. This could be a function of LAUSD overall becoming more Latinx (i.e., non-Latinx communities having moved outside of district boundaries while Latinx populations move in) and/or of intentional policymaking on behalf of district officials to place schools in these neighborhoods. While we cannot know which factor is most at play here, one thing is evident from the maps: TWDL schools are not opening up in overwhelmingly or adjacent to white communities.

[INSERT FIGURE 7 HERE]

TWDL may not be opening in predominantly white neighborhoods, but they could still be opening in neighborhoods undergoing economic shifts. To explore this, we use Zillow Home Value

Index (ZHVI) data at the neighborhood level beginning in 2005.[x] Results are shown in Figure 8 and reveal a couple of patterns. First, home prices have grown steeply across neighborhoods served by the district. Second, the overall trend in home prices suggests neighborhoods which house TWDL programs have lower average home prices than neighborhoods without TWDL programs, despite increases across the board. This suggests that TWDL programs are not, for the most part, opening in "gentrifying" neighborhoods even though it is the case that home values have been rising in all areas served by LAUSD. We find that TWDL and non-TWDL neighborhoods have experienced similar rates of change in their ZHVI across time, with neighborhoods of TWDL experiencing lower home price changes across nearly all time points save the first (See Figure A1).

[INSERT FIGURE 8 HERE]

RQ2. What are public school enrollment patterns of neighborhoods serving TWDL schools and is enrollment significantly associated to program emergence? How do these trends/patterns vary before and after passage of Proposition 58?

As noted earlier, between 2000 and 2022 LAUSD experienced a generalized decline in enrollment. However, enrollment changes were more pronounced in schools and neighborhoods which eventually adopted TWDL. In addition, after 2010, we see lower declining enrollment rates every year in neighborhoods without TWDL, something that is not observed in those with TWDL programs. We examine these trends in Figure 9, which shows enrollment trends for neighborhoods that eventually adopted TWDL relative to those which never did. We calculate the cumulative enrollment change shown in percentage terms relative to prior years. For neighborhoods where TWDL schools are located, we only examine enrollments *prior* to a neighborhood adopting TWDL in one of the schools located within it. We note that TWDL neighborhoods consistently exhibit declining enrollment prior to founding TWDL, relative to their non-TWDL counterparts. In addition, we examine enrollment changes at the zip code level, which contain on average four

schools per neighborhood (see Figure A2 of the Online Appendix). We note that, consistent with our tract level descriptives, zip codes that contain within them at least one TWDL school experience enrollment declines prior to TWDL founding.

[INSERT FIGURE 9 HERE]

The visual trends are supported by statistical evidence shown in Table 2. Here we estimate three models, the first whether there is a statistically significant relationship between cumulative enrollment change and TWDL adoption, the second with the addition of years as controls, and the third testing for the impact of Proposition 58. We find that prior to adopting a TWDL program, neighborhoods experience enrollment decline and that this is significantly related to program founding. Though the magnitude of the coefficient is small, schools exhibit a lower likelihood of program adoption with each percentage increase in cumulative enrollment change. This likelihood does not meaningfully change when we control for year or Proposition 58 binary variable. Even though the year of founding does not increase the likelihood of program adoption (the coefficients remain below one for all years), we see that coefficients increase as time goes on, indicating to us that later years have had an impact on program founding.

[INSERT TABLE 2 HERE]

RQ3. What is the dispersion of charter schools across neighborhoods serving TWDL schools and is the presence of charter schools significantly associated to program emergence? How do these trends/patterns vary before and after passage of Proposition 58?

Our third and last research question examines whether the growth in charter schools in a neighborhood co-occurs with the opening of TWDL programs. Recall that LAUSD has been under enormous enrollment decline pressures since the early 2000s, related to demographic shifts as well as growing numbers of charter schools in the district competing for a dwindling pool of students. Elementary charter schools, like TWDL schools, also experienced dramatic increases in the last

two decades. Between 2000 and 2022, the number of elementary charter schools tripled in the district, while enrollment declined. While some of this growth is composed of district-operated charter schools, the vast majority (81.5%) are independent charter schools located within district boundaries. In addition, the share of elementary charter school enrollment has nearly overtaken the share of non-charter enrollment, and of those, only one is also a TWDL school.

Next, we examine whether TWDL elementary schools (all but one of which are not charter schools) are located nearby charter schools—this group includes both district administered and independent charter schools. In Figure 10, we examine the number of charter schools within neighborhoods of TWDL schools using zip codes as a measure of neighborhood. Zip codes are an appropriate measure given that charter schools' catchment area is larger than traditional attendance boundaries. We see that in the early 2000s, neighborhoods with TWDL schools were populated by fewer charter schools than neighborhoods without TWDL schools, by a difference of about 25 charter schools. However by 2010, this trend had reversed and neighborhoods with TWDL schools became not only more populated by charter schools, but increasingly so. In fact, by 2020, neighborhoods (zip codes) of TWDL schools had about 25 more charter schools than neighborhoods (zip codes) without TWDL schools. While this does not indicate a direction or causal relationship, it shows that charter school emergence has ocurred alongside TWDL expansion, as has been suggested by the literature.

[INSERT FIGURE 10 HERE]

We visualize the dispersion of TWDL and charter schools in Figure 11 and observe that the increase in the number of charter schools (lighter shaded x's) between 2000 and 2022 occurred in the northern and southwestern part of the district, areas that also experienced TWDL growth (darker shaded circles), with particular prevalence in the southwestern part of the district which

experienced a dramatic increase in both TWDL and charter school expansion. When we examine by city (see Figure A3 in the Online Appendix), we see that those cities with TWDL schools (15 of the 27 total cities and unincorporated areas) have had a continuous and dramatic increase in the number of charter schools, though this seems largely driven by the city of Los Angeles, in which most TWDL and charter schools are located.

[INSERT FIGURE 11 HERE]

We further examine this relationship statistically and find that an increase in the number of charter schools in a zipcode increases that neighborhood's likelihood of founding at least one TWDL program when controlling for neighborhood demographic and economic characteristics. We observe that charter school emergence increases the likelihood of TWDL emergence in certain neighborhoods of the district (model 1). This relationship is also observed and the likelihood is further increased when we include controls for enrollment change (model 2) and year (model 3), suggesting that neighborhoods experiencing enrollment declines *and* competition from charter school options are likelier to see TWDL programs being founded.

[INSERT TABLE 3 HERE]

Discussion

In this study, we examined the expansion and dispersion of two way dual immersion programs (TWDL) in the Los Angeles Unified District across a 22 year period and explored three factors linked to TWDL emergence, neighborhood change (such as gentrification), enrollment decline, and school choice. We first descriptively examined 22 year trends in neighborhood racial/ethnic composition, enrollment, and charter schools, and how this differed between neighborhoods of TWDL and non-TWDL schools. By examining neighborhood demographic and economic shifts, we examined the extent to which schools opening TWDL

were dispersed in neighborhoods accessible to historically marginalized populations – Latinx, Black/African American, Asian-Americans and lower wealth (which we proxied using housing data). This study provides an important contribution in the way of understanding how forces like neighborhood change, and policy, can shape the emergence of school opportunity. Our case study of Los Angeles Unified over time allowed us to examine the emergence of TWDL in a district where some neighborhoods have undergone dramatic shifts.

Our findings indicate that, contrary to what has been described in the literature, TWDL programs in Los Angeles Unified have not been concentrated in neighborhoods experiencing increasing white resident populations and home price increases relative to those neighborhoods without TWDL. We saw that overall, TWDL growth is happening in a wide variety of neighborhood contexts, including, but not limited to, neighborhoods that are exhibiting signs of neighborhood change (i.e., "gentrifying" neighborhoods).

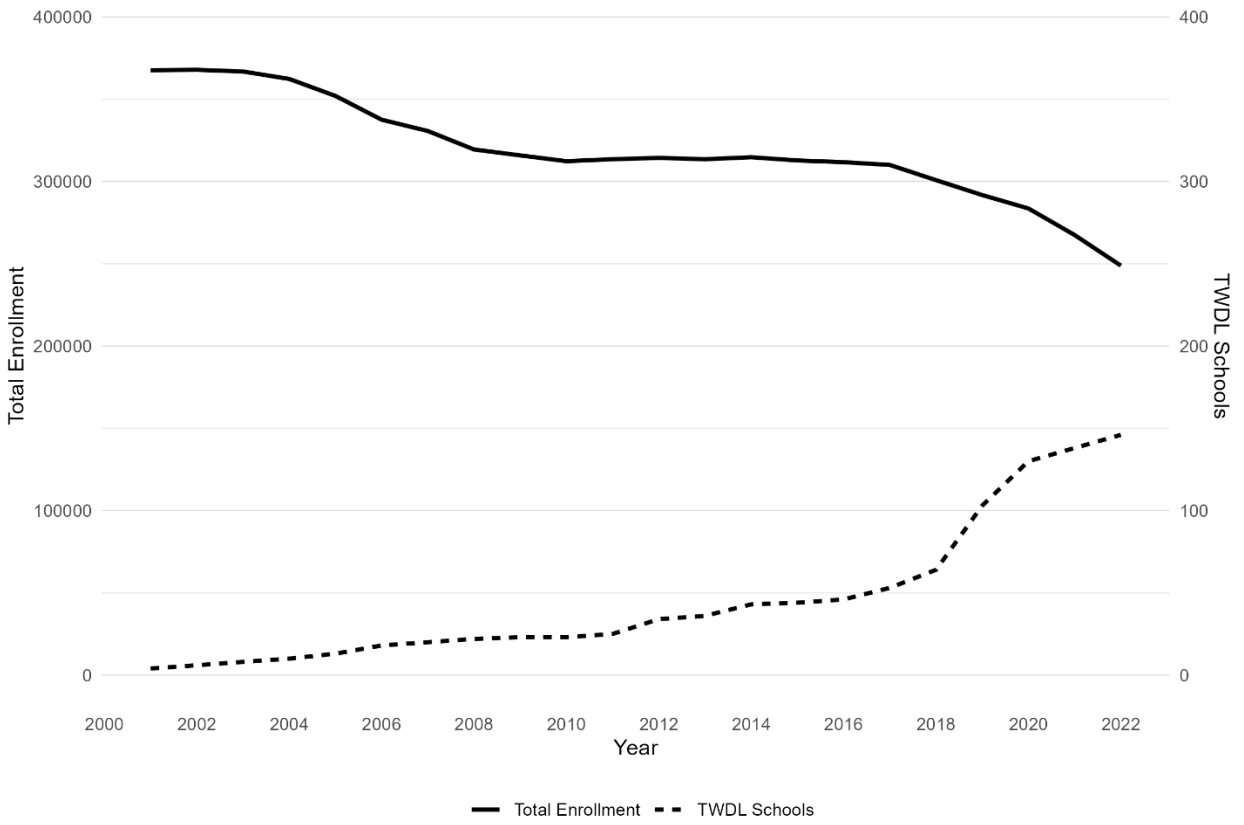
By contrast, we found that, consistent with prior literature, TWDL schools opened in neighborhoods that had been experiencing important enrollment declines alongside increased numbers of charter schools in proximity. This suggests to us that regardless of neighborhood shifts, TWDL is appearing in areas of increased competition for student enrollment.

Limitations and Future Directions

It is evident that without examining program level enrollments within schools, we are left to wonder the extent to which programs serve the variety of populations residing in these schools' neighborhoods. Indeed, Palmer's (2010) and Chavez-Moreno's (2020) studies demonstrate that a TWDL school can enroll - *at the school level* - a diverse set of students, while the program itself be much less diverse. We can only speculate as to whether TWDL program in what we found to be mixed minority neighborhoods are being used to segregate, or on the

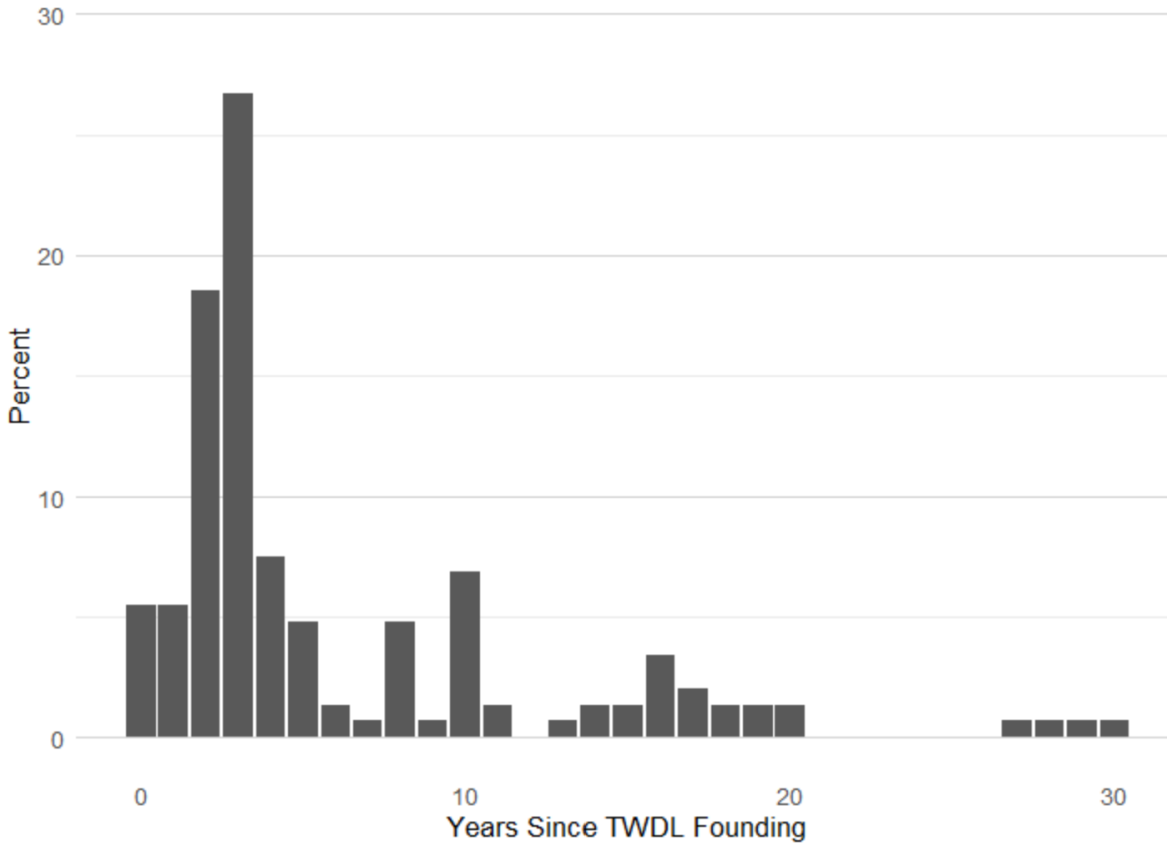
contrary provide a meaningfully multilingual space for language learning. These largely descriptive findings help us understand general, twenty-year trends of TWDL program expansion and dispersion in a district undergoing many of the phenomena described in the literature on this topic. The rigorous qualitative work that has been undertaken suggests that even within program dynamics can allow pervasively exclusionary practices if left unattended. Future endeavors examining systematic growth of programs should examine the relationship between neighborhoods and programmatic enrollments – a number that is difficult to figure out with publicly available data.

Figure 1. Change in District Elementary Enrollment and TWDL School Expansion



Note. Elementary Enrollment data is obtained from the California Department of Education (CDE) for all years. Elementary TWDL schools founding years is obtained from publicly available list of schools (*Directory of Programs*, 2021). Elementary enrollment in TWDL schools represents .25% of total enrollment in the district.

Figure 2. Elementary TWDL Programs in LAUSD, by Years Since Program Founding



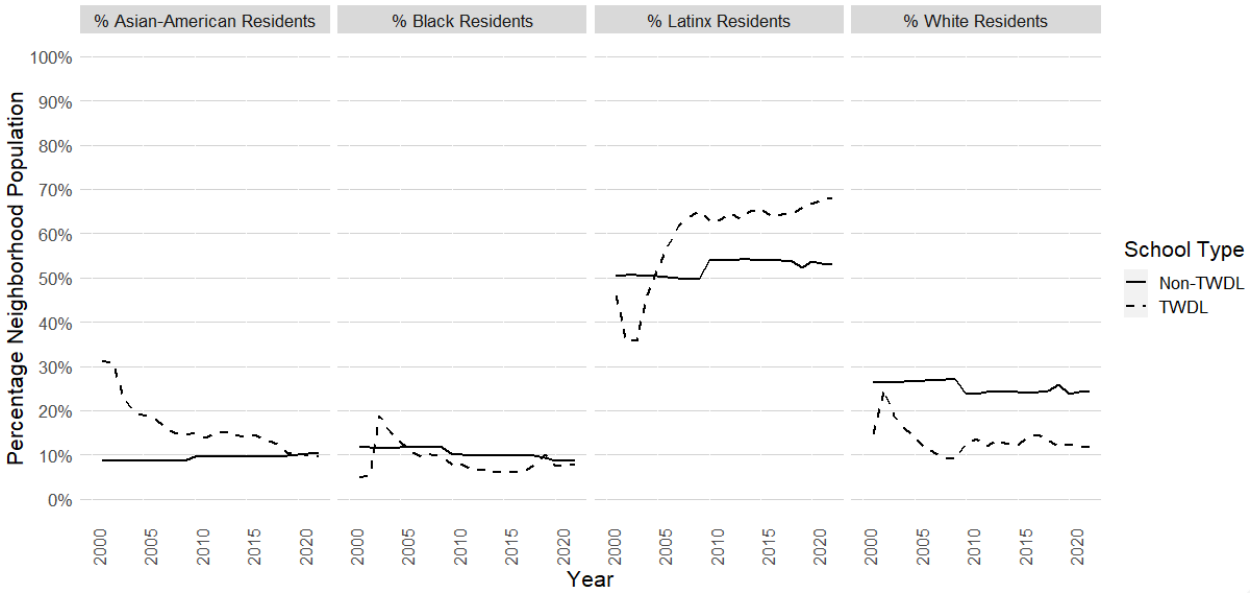
Note. Founding years obtained from publicly available list of bilingual programs (*Directory of Programs*, 2021).

Table 1. Economic and Demographic Characteristics of LAUSD Elementary School Neighborhoods (Census tracts and Zip codes), 2005 – 2022

summary_variable	2001	2005	2010	2020
Asian-American (%)	8.98	8.98	9.93	10.14
Black or African-American (%)	11.69	11.69	10.03	8.4
Latinx (%)	50.35	50.35	54.43	56.49
White (%)	26.26	26.26	23.28	21.4
ZHVI ($)		558041.18	432142.47	772827.89
ZHVI Change (%)		0	-4.05	7.25
Observations	467	492	555	615

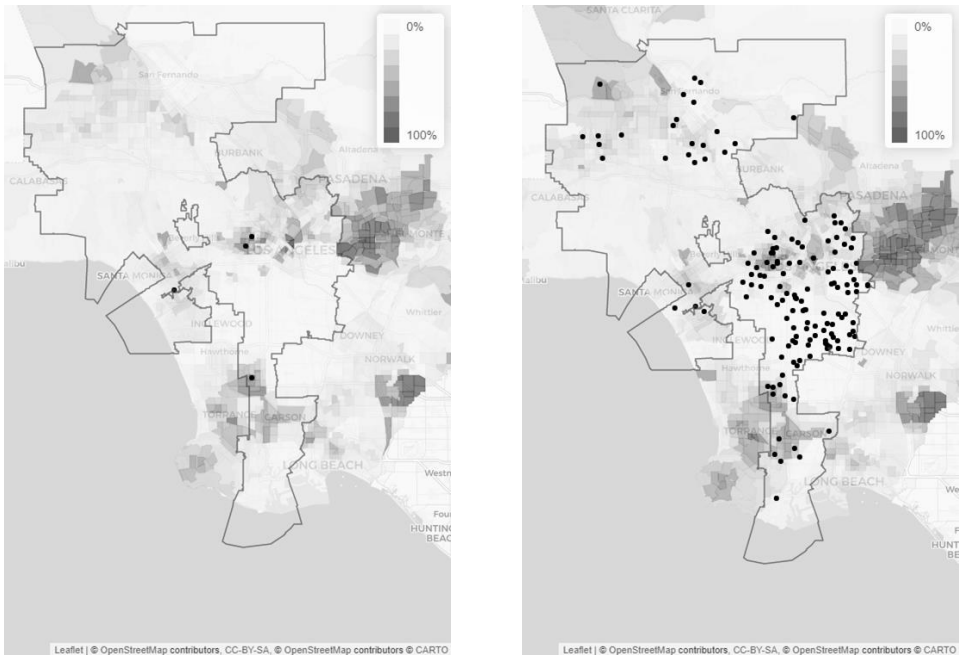
Note. Observations refer to the total number of elementary schools. Neighborhood characteristics use both the census tract (for demographic data) and zip code (for Zillow data). Race/ethnicity variables are obtained from the Decennial Census from years 2000, 2010, and 2020 (year 2005 values use data from the 2000 census). Asian-American, Black/African-American and White are non-Latinx. Zillow Home Value Index (ZHVI) values are in dollars and are adjusted for inflation to 2022 dollars. The first year available for Zillow data is 2005, therefore values for 2001 are left blank. Percentage calculations are our own.

Figure 3. Neighborhood Demographics of Elementary TWDL and Non-TWDL Schools in LAUSD, 2000 – 2022



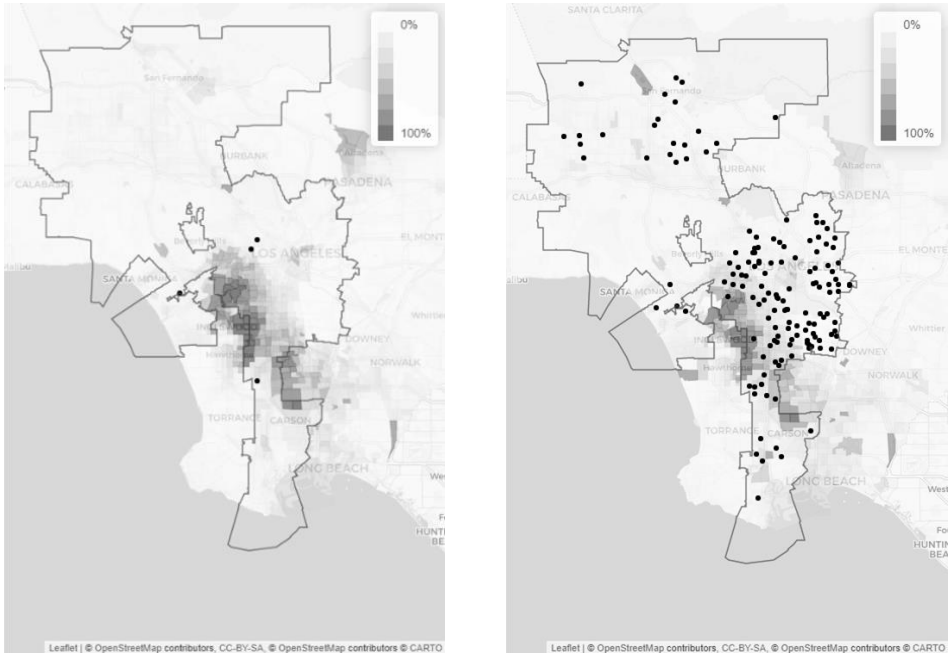
Note. Neighborhood population aggregated to all TWDL and non-TWDL tracts. Data obtained from the decennial census (2000, 2010, 2020) and spread to subsequent years (Decennial 2000 for 2001 to 2009, etc). The corresponding data table may be found in Table A2 of the Appendix.

Figure 4. Asian-American Residents and TWDL School Dispersion, 2000 and 2022



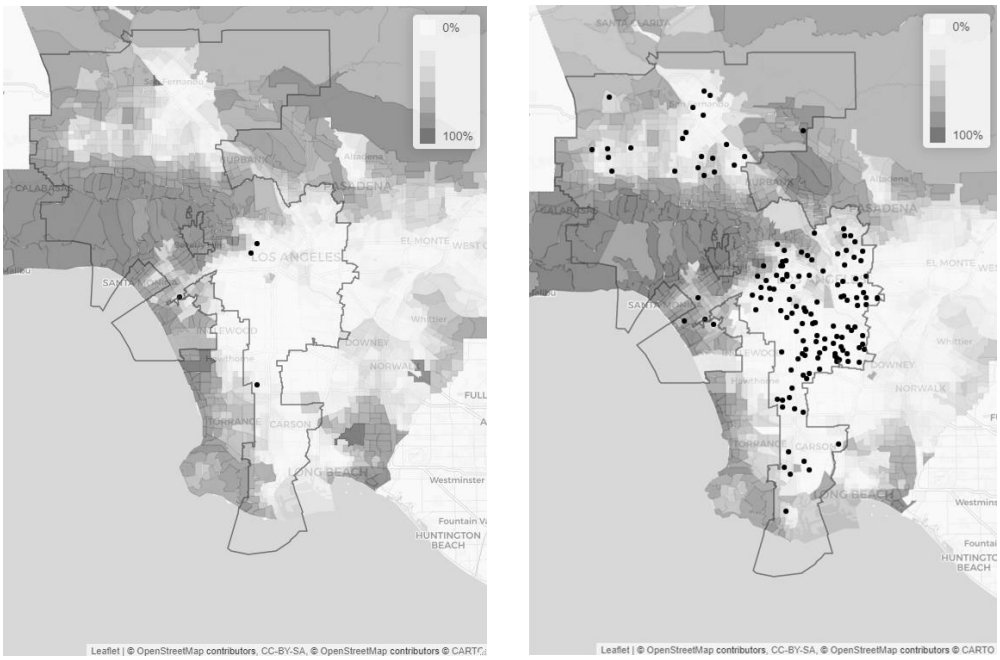
Note. Neighborhood data obtained from the Decennial Census for the year 2000 and 2020. Calculations of proportions are our own and represent the total number of non-Hispanic Asian-American residents within a census tract. Elementary TWDL program founding obtained from LAUSD and represents the year 2000 – 2001. Neighborhoods in 2022 utilize data from the Decennial 2020 census.

Figure 5. Proportion of Black Residents and TWDL School Dispersion, 2000 and 2022



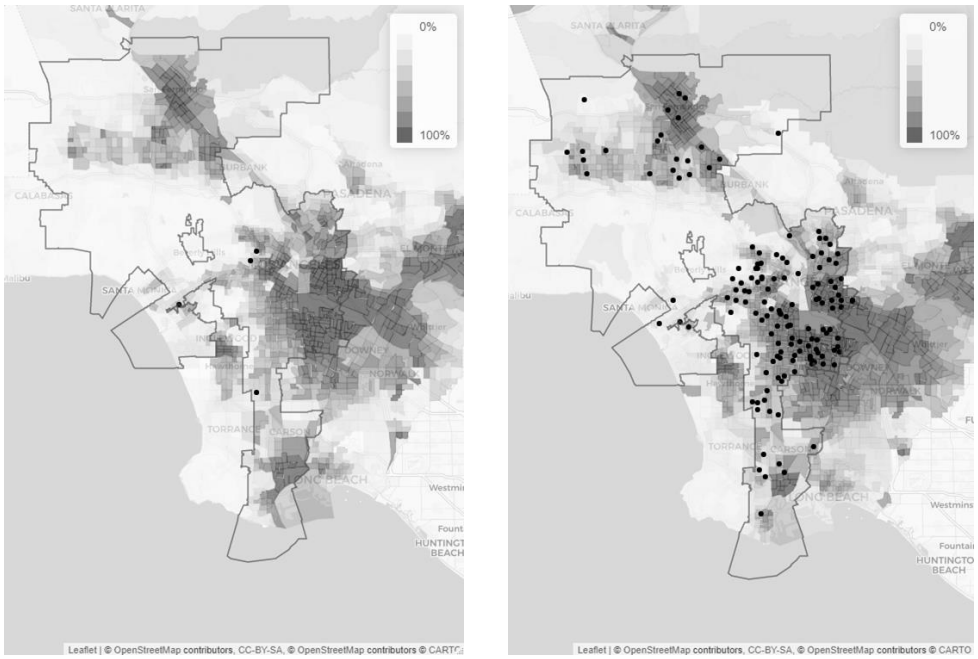
Note. Neighborhood data obtained from the Decennial Census for the year 2000. Calculations of proportions are our own and represent the total number of non-Hispanic Black residents within a census tract. Elementary TWDL program founding obtained from LAUSD and represents the year 2000 – 2001. Neighborhoods in 2022 utilize data from the Decennial 2020 census.

Figure 6. Proportion of White Residents and TWDL School Dispersion, 2000 and 2022



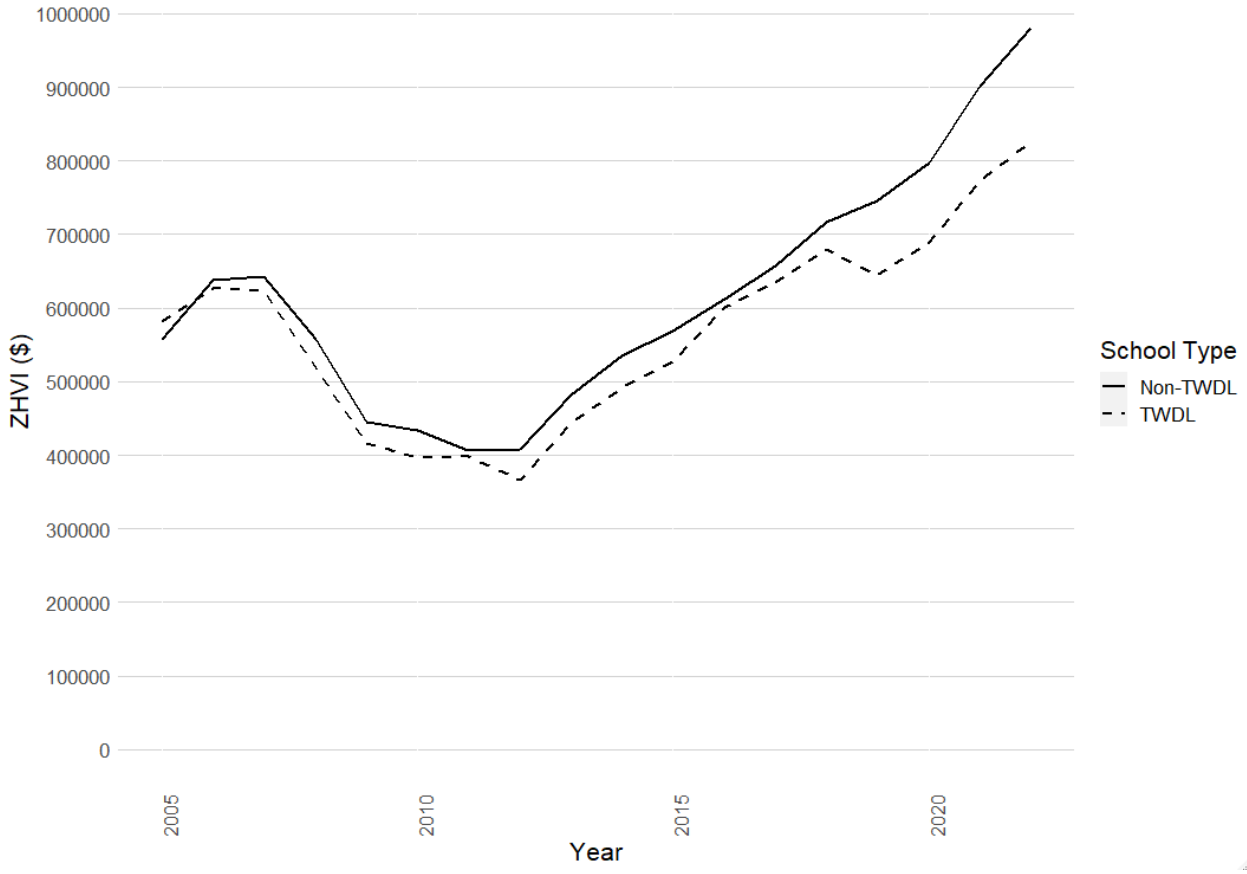
Note. Neighborhood data obtained from the Decennial Census for the years 2000 and 2020. Calculations of proportions are our own and represent the proportion of non-Hispanic white residents within a census tract. Elementary TWDL program founding obtained from LAUSD and represents the year 2000/2001 and 2021/2022. Neighborhoods in 2022 utilize data from the Decennial 2020 census.

Figure 7. Proportion of Latinx Residents and TWDL School Dispersion, 2000 and 2022



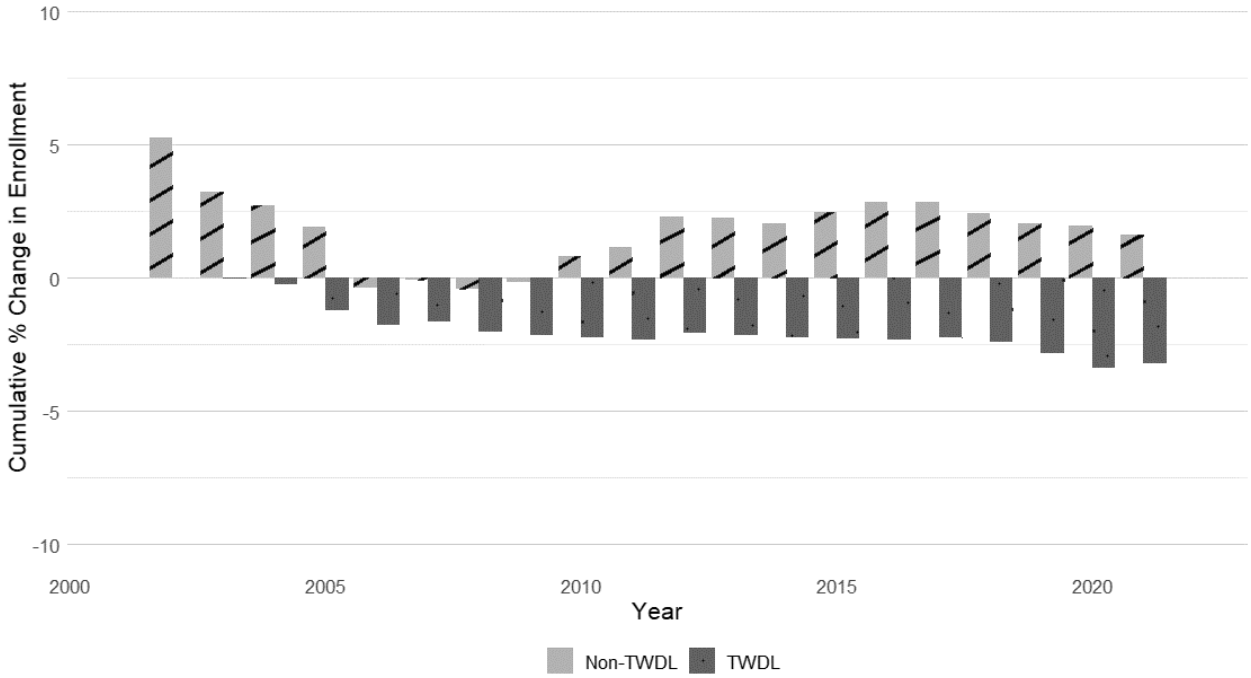
Note. Neighborhood data obtained from the Decennial Census for the years 2000 and 2020. Calculations of proportions are our own and represent the proportion of Hispanic (or Latinx) residents within a census tract. Elementary TWDL program founding obtained from LAUSD and represents the year 2000/2001 and 2021/2022. Neighborhoods in 2022 utilize data from the Decennial 2020 census.

Figure 8. Economic Trends of TWDL and non-TWDL School Neighborhoods



Note. Data obtained from Zillow of Zillow Home Value Index (ZHVI) with the typical value of a home expressed in dollars. Prices have been adjusted for inflation to 2022 dollars.

Figure 9. Cumulative Enrollment Change (%) by TWDL Status, prior to program adoption, 2000-2022



Note. Enrollment data obtained from the California Department of Education for academic years 2000/2001 to 2021/2022. Cumulative enrollment change indicates the cumulative percentage change in enrollment at the tract level for all years prior to each year. For TWDL schools, we only include cumulative enrollment change before a school adopts TWDL. For non-TWDL schools, we include all elementary schools at all time points.

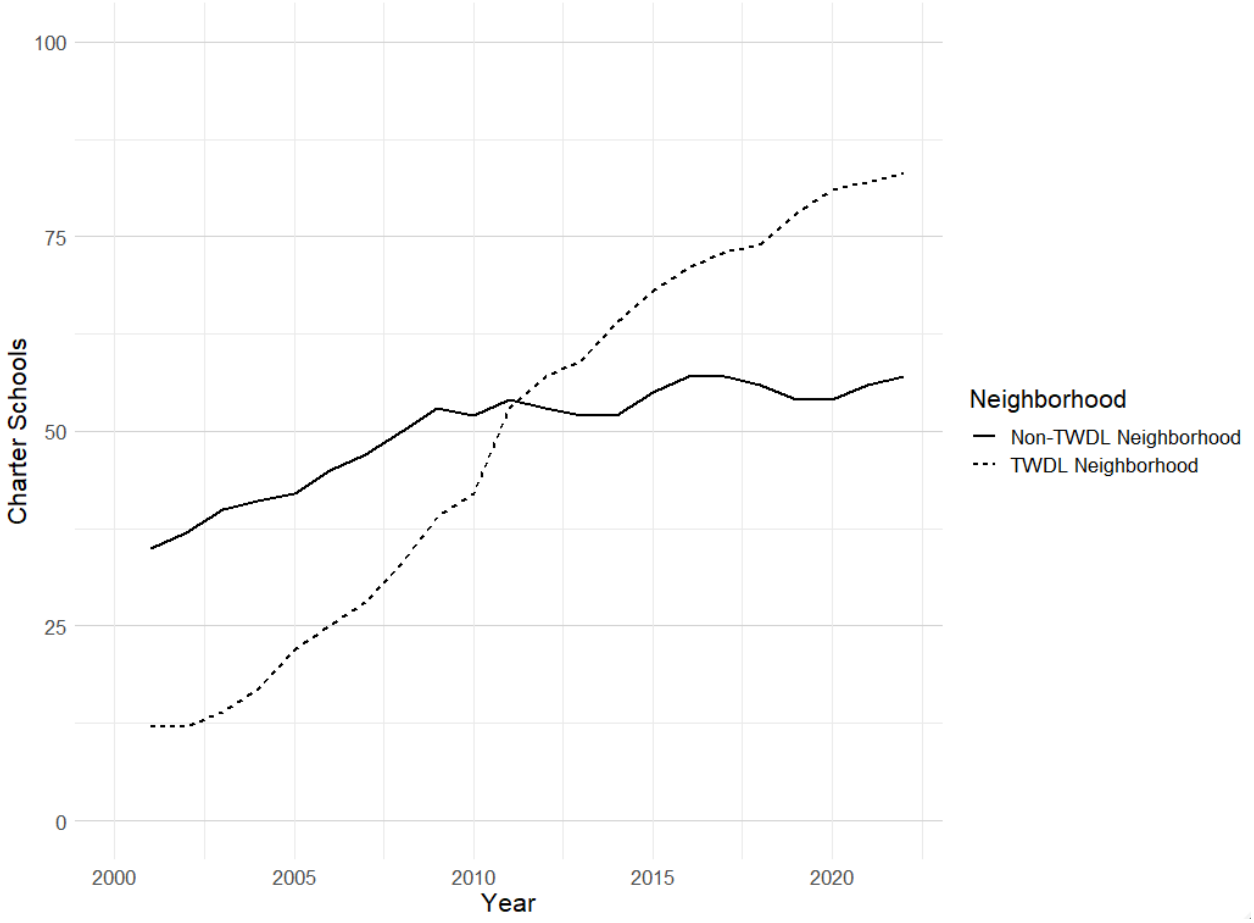
Table 2. Relationship Between Cumulative Enrollment Change and Adopting a TWDL Program

	Model 1	Model 2	Model 3
Cumulative Enrollment Change	0.990 ***	0.992 *	0.989 ***
	(0.002)	(0.004)	(0.002)
2002		0.015 ***	
		(0.411)	
2003		0.019 ***	
		(0.357)	
2021		0.338 ***	
		(0.101)	
2022		0.361 ***	
		(0.100)	
Founded post Prop 58			0.248 ***
			(0.046)

Standard errors are heteroskedasticity robust. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

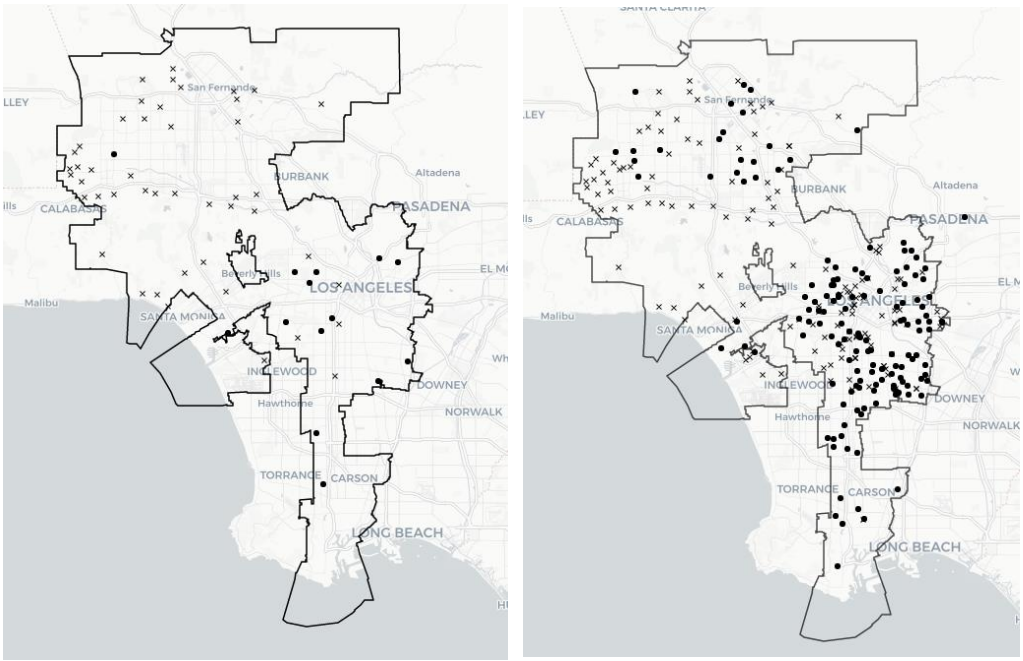
Note. Results from estimating logistic regression. Coefficients represent odds-ratios and are interpreted as lower likelihood of an event happening when <1, and higher likelihood when >1. Coefficients for years 2004 to 2020 are also below 1 and statistically significant and can be found in Table A3.

Figure 10. Charter Schools in TWDL and non-TWDL Neighborhoods (Zip codes), 2000 – 2022



Note. Neighborhood measure is calculated by a school's zip code. A TWDL neighborhood is a neighborhood (zip code) in which at least one TWDL school is located. A non-TWDL neighborhood is one in which no TWDL schools are located.

Figure 11. Charter and TWDL School Dispersion, 2000 and 2022



Note. Black circles are TWDL schools, light shaded x's are charter schools. Outline of the district is included. Zip code outlines are omitted for improved visibility.

Table 3. Relationship Between Charter Emergence and Adopting a TWDL Program

	Model 1	Model 2	Model 3
Charter count	1.395 ***	1.550 ***	1.394 ***
	(0.049)	(0.053)	(0.056)
Latinx (%)	0.994 ***	0.988 ***	1.323 ***
	(0.001)	(0.002)	(0.076)
Asian-American (%)	1.024 ***	1.022 ***	1.389 ***
	(0.005)	(0.005)	(0.081)
Black/African American (%)	0.968 ***	0.961 ***	1.301 **
	(0.003)	(0.004)	(0.079)
white (%)	0.930 ***	0.927 ***	1.259 **
	(0.004)	(0.004)	(0.080)
ZHVI ($)	1.000 ***	1.000 ***	1.000 ***
	(0.000)	(0.000)	(0.000)
ZHVI change (%)	1.187 ***	1.207 ***	1.237 **
	(0.032)	(0.033)	(0.067)
Enrollment change (%)		0.751 ***	0.759 ***
		(0.042)	(0.044)
2005			0.000 ***
			(7.603)
2022			0.000 ***
			(7.450)

Standard errors are heteroskedasticity robust. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Note. Results from estimating logistic regression. Coefficients represent odds-ratios and are interpreted as lower likelihood of an event happening when <1, and higher likelihood when >1. Coefficients for years 2006 to 2021 are also 0 and statistically significant and can be found in Table A4 of the Online Appendix.

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Notes

[i] TWDL traditionally has three main goals: linguistic proficiency in two languages, high academic achievement, and greater cross-cultural understanding (California Department of Education 2022).

[ii] TWDL frames bilingual education as an enrichment program and treats students' home language as an asset (Ruiz, 2984; Cervantes-Soon et al., 2017). This is in stark difference to bilingual programs funded under Title VII of the Elementary and Secondary Education Act, which (at least initially) specifically provided funds for low-income, Spanish speaking students (Stewner - Manzanares 1988). Later iterations specified transition to English as a primary goal of bilingual education. In immigrant and immigrant-origin communities where the partner language may be a vital part of students' heritage, TWDL programs can strengthen students' identity development (Lopez, 2013; Cervantes-Soon et al., 2017). Bilingual education can thus aid the struggle for greater equality for Latinx, Asian-Americans and other language-minoritized populations who have struggled to thrive in schools not designed for them (C. G. Cervantes-Soon et al. 2017b; Flores 2016).

[iii] To fulfill its goals of high academic outcomes, biliteracy, and cultural competence in an integrated setting, TWDL enrolls a critical mass of both English and partner-language speakers. Partner language speakers are often children of immigrants (or immigrants themselves) often from racialized, working-class communities. The promise of TWDL is that recruiting and positioning these students at the center and providing culturally- and linguistically relevant pedagogy, will improve their academic achievement and educational outcomes without compromising their heritage and linguistic assets.

[iv] We acknowledge that important factors influence which students enroll in a dual language program, which often exists as a strand within a school (see, for example, Palmer, 2010 or Chavez-Moreno, 2022), however examining within-program enrollment is beyond the scope of this study.

[v] For example, New York City experienced a drop in student enrollment from about one million students in 1968 to 935,000 by 1998. Notable exceptions included Los Angeles, San Diego, Ft. Worth, Albuquerque, and San Antonio, which saw enrollment increased between 1988 and 1998.

[vi] In Lau v. Nichols, the United States Supreme Court unanimously decided that the lack of supplemental language instruction in public school for EL-classified students violated the Civil Rights Act of 1964. Although the ruling did not mandate any specific kind of language instruction (i.e., bilingual education or other), many states interpreted this as a mandate to expand bilingual education.

[vii] Before 1998, one-third of EL-classified students in the state were enrolled in bilingual schools. After that year, this proportion decreased to 8 percent (Parrish, et al. 2006).

[viii] The following year, the state Department of Education announced an initiative known as Global California 2030 (California Department of Education, 2018), under then state superintendent Tom Torlakson. This aimed to have half of K-12 students participating in language programs by the end of the decade. It has provided funds for schools to develop TWDL programs, resulting in a rapid increase in the number of two-way programs.

[ix] This follows a general decline in school-aged population in both the county and the state. California's elementary aged population peaked in 2000 with 3.8 million students, which decreased to 3.4 million by 2021. Los Angeles County experienced its peak in 2000 at 790 thousand elementary-aged children and hovers now at around 620 thousand.