Does Peer Motivation Impact Educational Investments? Evidence from DACA

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Abstract

Preliminary and Incomplete

Despite the significant influence that peer motivation is likely to have on educational investments during high school, it is difficult to test empirically since exogenous changes in peer motivation are rarely observed. In this paper, I focus on the 2012 introduction of Deferred Action for Childhood Arrivals (DACA) to study a setting in which peer motivation changed sharply for a subset of high school students. DACA significantly increased the returns to schooling for undocumented youth, while leaving the returns for their peers unchanged. I find that DACA induced undocumented youth to invest more in their education, which also had positive spillover effects on ineligible students (those born in the US) who attended high school with high concentrations of DACA-eligible youth.

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1 Introduction

Educational attainment is critical for economic mobility (Goldin & Katz, 2009). However, many communities lag behind in both high school completion and college enrollment. For instance, in Los Angeles public high schools (the setting for this study), only 60 percent of students graduated from high school in 2011 (nearly 15 p.p. below the national average). While there are many factors that likely explain these educational attainment gaps (e.g. poverty, instability at home, lack of motivation, trouble in school), for adolescents who deeply care about social image (Lavecchia, Liu and Oreopoulos, 2015; Bursztyn, Egorov, and Jensen, 2018), peer motivation is likely to play a critical role. However, despite the likely importance of peer motivation on educational investments, it is difficult to test this empirically since exogenous changes in peer motivation are rarely observed.

In this paper, I study the *spillover effects* of a policy that significantly increased the returns to schooling for undocumented youth: the introduction of Deferred Action of Childhood Arrivals (DACA). Beginning in 2012, undocumented youth could receive temporary protection from deportation and work authorization if they were enrolled in school or completed high school.[1] Thus, DACA dramatically increased the incentives for undocumented youth to complete high school. Indeed, prior work suggests that the introduction of DACA significantly increased the likelihood that undocumented youth completed high school, by as much as 5.9 p.p (or 7.5 percent) (Kuka, Shenhav, and Shih, 2019). Building upon this evidence, I also find that DACA led undocumented youth to invest more in their education, as measured by improvements in academic achievement. Studying the impact DACA had on US-born students (who were not directly impacted by the policy) provides an ideal natural experiment to better understand the responsiveness of educational investments to changes in peer motivation.

This paper documents the existence of peer effects due to DACA using administrative data from Los Angeles Unified School District (LAUSD). An important feature of these data is that I can

[1] DACA also required undocumented youth to meet specific age/date of arrival criteria and to have never committed a felony. Section 2 provides more detail on all of the DACA-eligibility criteria.

identify each student's country of birth. This allows me to identify a group of students who were not eligible for DACA precisely, since I can focus on students born in the US. In addition, I observe each student's residence zip-code. Thus, in lieu of observing legal status of foreign-born students, I am able to utilize geographic variation in the undocumented population across Los Angeles to approximate undocumented status.[2] This allows me to identify a group of students who were likely to be undocumented in a more precise way than focusing on foreign-born students alone would.

My research design leverages the plausibly exogenous increase in the returns to schooling for undocumented youth due to DACA and variation in the fraction of one's peers who were DACA-eligible. Specifically, I identify the spillover effects of DACA using a difference-in-differences approach that compares the outcomes (e.g. high school completion, achievement) of US-born students in high schools with higher concentrations of DACA-eligible peers to those in high schools with lower concentrations, before and after the 2012 introduction of DACA.[3] The identifying assumption is that students in high schools with higher concentrations of DACA-eligible peers had similar counterfactual trends as students in schools with fewer DACA-eligible peers. Event-study graphs demonstrate that the concentration of DACA-eligible high school peers is uncorrelated with outcomes for cohorts expected to graduate before DACA's enactment. Thus, it is unlikely my results will be driven by pre-trends. In addition, I show that changes in baseline achievement or predicted outcomes are uncorrelated with the concentration of DACA-eligible peers. This suggests that endogenous changes in high school composition are also unlikely to be driving my results.

I find that DACA led to significant increases in educational investments in Los Angeles. For likely undocumented youth, high school graduation increased by 8 p.p.(or 13 percent). These effects are driven by males and those students who were lower-achieving at baseline. The magnitude

[2]My preferred way to approximate undocumented status uses administrative data on DACA applications by age and zip from the U.S. Citizenship and Immigration Services (USCIS). Section 3.1.2 provides more detail on how this measure is constructed. However, results are similar if I use the fraction of foreign born non-citizens by zip-code, which is typically used in the literature to approximate undocumented status (Pope, 2016; Amuedo-Dorantes and Antman, 2016; Kuka, Shenhav, and Shih, 2019).

[3]Similarly, I identify the direct effects using a difference-in-differences approach that compares foreign-born students living in zip-codes with higher concentrations of DACA-eligible youth (who were more likely to be DACA-eligible) to those with lower concentrations (who were less likely to be DACA-eligible), before and after the introduction of DACA.

of this effects is very close to Kuka et. al (2019) who focus on a national sample and use a slightly different approach. In addition, I find that DACA led to significant improvements in effort among likely undocumented youth, with increases in English Language Arts (ELA) achievement. The increased effort of undocumented students had positive spillover effects on their US-born peers. At the average campus with 2 percent of likely undocumented students, after DACA's introduction, US-born students experienced a 2 percentage points (or 4 percent) increase in the likelihood of high school graduation. These results are driven by low-achieving students. Achievement on ELA exams during high school also increased by 0.07 standard deviations after DACA's enactment. Gains in achievement occurred for all US-born students, regardless of baseline achievement.

The increased incentives to graduate high school among undocumented youth could spillover to US-born students in multiple ways. First, US-born students could have been impacted by peer-to-peer interactions. That is, since DACA-eligible students were likely to be studying harder, their increased effort could have led their peers also to study harder. Second, improved academic performance of undocumented youth could have freed up the time of teachers and administrators to improve instruction. Finally, the introduction of DACA may have led to additional investments in school with higher shares of undocumented youth. For instance, if schools trained guidance counselors to understand the process of college admissions for DACA-eligible students better, this training could have spilled over to their peers.[4] While I am currently not able to separately identify which of these mechanisms are driving my results, all three mechanisms likely played a role.[5]

This paper contributes to two key literatures. First, it contributes to the small literature on spillover effects of policies that increase the returns to schooling for specific subgroups. While there is an existing literature that estimates the direct impact of increasing the returns to education for specific student groups (Kuka, Shenhav, Shih, 2018; Abramtizky and Lavy, 2014), I am aware of only one other study that tests whether such policies spillover to non-eligible peers (Abramtizky,

[4]It is also important to acknowledge that since DACA induced lower-achieving students to stay enrolled in school, this may have taken up teachers time (or school level resources in general) to the disadvantage of their US-born peers. Given the pattern of results I document (i.e. positive spillovers), it is unlikely that this is the primary mechanism.

[5]Future versions of this paper will investigate changes in school spending patterns to determine the extent to which changes in school spending could be driving the positive spillover results.

Lavy, and Perez, 2018). Abramtizky and Lavy (2014) find that a pay reform change (from full income sharing to productivity based waging) for kibbutz members in Israel improved high school outcomes for those directly eligible. Abramtizky, Lavy, and Perez (2018) find that this also increased educational attainment for non-kibbutz peers. Because high school completion was so high in their setting (over 95 percent were completing), they can only address whether there are spillover effects on the margin of college enrollment. My project builds upon this recent work by addressing whether policy spillovers exist on the margin of HS completion in a large low-performing school district

Second, it contributes to the literature on policies targeted to undocumented youth. Closely related to this paper are several papers that address the direct impacts of DACA. Most of these papers have focused on students who completed high school and focus on the effects of DACA on labor market and college outcomes (Pope, 2016; Amuedo-Dorantes and Antman, 2017; Hsin and Ortega, 2017). Only one other study has focused on DACA-eligible youth before high school decisions are made (Kuka, Shenhav, Shih, 2019). Kuka et. al (2019) use the ACS and find HS graduation rates increased by 4-11 pp for DACA-eligible youth. I am able to make two important contributions to the literature on DACA by utilizing administrative data from Los Angeles schools. First, I am able to focus on intermediate outcomes that allow me to test whether DACA led to increased effort in school. Second, I am able to link DACA-eligible youth to peer groups during high school to address the educational spillover effects of this policy.

2 Policy Background

Signed into law under an executive order in June 2012, DACA provides temporary protection from deportation and a work permit for undocumented youth who entered the US as children. In addition to being undocumented, DACA requires individuals meet a series of age/date of arrival (i.e. arrival to the US before they were 16 and by June 2007)[6] and minimum education requirements. DACA

[6]It is important to highlight that these age/date of arrival criteria require undocumented youth to reside in the US for at least 5 years. Thus, DACA-eligible youth are not recent immigrants. This is important when interpreting the peer effects results. Because DACA eligible youth had already been living in the US for a significant amount of time when the policy was implemented, they were likely to be well integrated with their peers.

recipients must re-apply every two years to continue to receive these benefits.[7]

In this paper, I focus on the increased returns to schooling DACA introduced for undocumented youth. First, the minimum education requirements increased the returns to high school completion for students on the margin of high school completion. To be program eligible, undocumented youth were required to complete high school, earn a general educational development (GED) certificate or equivalent state-authorized exam, or currently be enrolled in school. Second, DACA may have also affected students on the margin of college enrollment. Because DACA made it possible for undocumented youth to have work permits, this may have increased the incentive to enroll in college.[8] Moreover, at the same time that DACA was enacted, undocumented youth in California became eligible for state financial aid through the introduction of the California Dream Act.[9] Thus, even undocumented youth who would have graduated from high school regardless of DACA, may have been more likely to invest in higher education.[10]

2.1 DACA-eligible Population in Los Angeles

Los Angeles provides an ideal setting to study the effects of DACA on student outcomes. Los Angeles is home to the largest percentage of DACA-beneficiaries in the US, accounting for 14 percent of all beneficiaries (NYT, 2016). Moreover, before DACA's enactment educational attainment of likely DACA-eligible youth in Los Angeles was low. At the time of policy introduction, 30% of potentially DACA eligible youth who met all of the age and date of arrival criteria had already dropped out of high school (MPI, 2014), and for those who completed high school most (slightly over 70%) did not pursue higher education.[11]

[7] During DACA renewals youth are not asked whether they still meet these criteria. Thus, it is possible for students to be enrolled in HS at the time of the initial application, but they have may have dropped out during the renewal process.

[8] Undocumented youth face several obstacles to college enrollment; the returns to a college are less clear for those unable to work in the formal sector, the costs of college are higher due to not being eligible for federal aid, and the threat of deportation may discourage youth from engaging with public universities.

[9] The California Dream Act was signed into law in 2011 and was effective as of 2012. This is the largest source of California state funded student financial aid. Cal Grant's cover up to $12,630 of yearly college expenses (which can be applied to tuition, room and board, or other supplies).

[10] Previous work finds large college enrollment gains for undocumented youth when in-state tuition is made available, and thus large increases in college affordability (Amuedo-Dorantes and Sparber, 2014; Flores, 2010).

[11] In 2012, only 20% of potentially eligible youth who completed high school were enrolled in college and 7% completed a college degree in Los Angeles (MPI, 2014).

Undocumented youth in Los Angeles also share much in common with their ineligible peers. Demographics are nearly identical across both groups. Over 86% of DACA applicants in California come from Mexico (Brookings, 2014), and roughly 60% of children living in Los Angeles have parents who are foreign born from Mexico. Because DACA-eligible youth are not recent immigrants (i.e. they are required to have lived in the US since 2007),[12] most have spent their entire schooling in US public schools, thereby increasing the likelihood that DACA-eligible youth were well integrated with their US-born peers.

3 Data and Summary Statistics

3.1 Data Sources

3.1.1 LAUSD Student-Level Data

I leverage administrative data from Los Angeles Unified School District (LAUSD). The dataset spans the years 1998 through 2017 and contains information on students from 8 cohorts (between 2007 and 2014), defined by the year that they were enrolled in 9th grade. These data track key academic and behavioral outcomes from 2nd grade until 12th grade. Specifically, this dataset includes attendance rates, state standardized exams, disciplinary actions, semester GPA, high school exit exams (referred to as the CAHSEE), SAT scores, yearly enrollment indicators and whether a student graduated from high school.[13]

LAUSD data also includes each student's country of birth, date of arrival to the US (if foreign-born), and residence zip-code. Since I observe each students country of birth, I am able to precisely identify students who were ineligible for DACA due to being born in the US. While I do not observe whether a whether a student is undocumented, I utilize variation in the concentration of undocumented populations across Los Angeles to approximate undocumented status.

[12] The median age of US entry was 6 while the most common age was 3 (NYT, 2016)

[13] While most of these outcomes are available for the whole time period, some are not. The HS Exit exam (CAHSEE) is administered to 10th graders, and to 11 and 12th graders if they fail in 10th grade. This test was suspended in 2015. This data is available from 2005/2006 - 2014/2015. There was no state standardized exam administered in 2013-2014 school year. There was a test taking regime change from CST to SBAC. SAT data is available from 2010/2011 - 2016/17

3.1.2 DACA Applicants by Zip-Code

As just noted, whether a foreign-born student is undocumented (and thus DACA-eligible) is unobserved in LAUSD data. Instead, I rely on the concentration of DACA applicants in each student's zip-code to determine their likelihood of being undocumented. For instance, the more foreign-born residents who applied to DACA in a student's zip-code, the higher the corresponding likelihood that they were undocumented. To construct this measure, I use administrative data on the number of DACA applications by age and zip-code from the U.S. Citizenship and Immigration Services (USCIS) and 1 year ACS estimates (2014) of the number of foreign-born by age and zip-code. Specifically, for each Los Angeles zip-code, I construct the share of foreign-born high school aged students (i.e. ages 15-19) who applied to DACA as follows:

$$\text{ShareEligible}_z = \left(\frac{\text{Total DACA Applicants (July 2012- December 2013)}}{\text{Foreign-Born Youth (CY 2014)}} \right)_z \tag{1}$$

where the numerator is constructed from USCIS data and the denominator from the ACS. There is significant variation in this measure across Los Angeles zip-codes, which is illustrated in Figure 1.

I use this measure to define treatment intensity under DACA for two main reasons. First, the measure approximates the underlying undocumented populations for small geographic areas. Since I focus on one county (i.e. Los Angeles county) it is critical for me to be able to leverage within county variation in the likelihood of being undocumented.[14] Second, using a measure that is based on administrative application data will estimate the undocumented population of a given zip-code with minimal measurement error. This is especially true given take-up of DACA was so high in Los Angeles (over 65%).[15]

[14] Typically, estimates of the undocumented population are available at more aggregated levels such as counties.

[15] Dividing the 72,180 initial applications received in 2012 - 2014 (Department of Homeland Security, U.S. Citizenship and Immigration Services 2015) by the 111,000 youths estimated to be immediately eligible for DACA (MPI) yields a take-up rate of 65%. While take-up in Los Angeles was relatively high compared to the national average of 54%, there are several reasons why eligible youth may have decided not to apply for DACA. For instance, some individuals incomplete take-up could be explained by the hesitance to provide information on legal status to the federal government.

Nevertheless, Equation 1 will undercount the underlying undocumented population living in a given zip-code. As long as the take-up of DACA across zip-codes was uncorrelated with trends in educational outcomes, this undercounting is unlikely to confound my estimates, however. Since I do not observe counts of undocumented populations by zip-code, I am unable to asses the extent to which program take-up was correlated with trends in educational outcomes. However, event-study plots demonstrate that educational outcomes in zip-codes with higher vs. lower concentrations of DACA-applicants (the geographic variation used in this paper) had similar trends prior to DACA's introduction. Reassuringly, approximating the undocumented population in other ways yield similar results. For instance, my results are similar if I approximate the undocumented population using the fraction of undocumented foreign-born individuals in a PUMA (MPI)[16] or the fraction of foreign-born non-citizens by zip-code using data from the ACS.[17]

3.2 Sample Construction

I focus on students enrolled in 9th grade between 2007 and 2014. This includes 9th grade cohorts who were unexposed (2007-2009), partially exposed (2010-2012) and fully exposed (2013-2014) to DACA during high school. Appendix Table A.1 shows DACA exposure by each 9th grade cohort.

Direct Impact Sample

To estimate the direct impacts of DACA, I focus on foreign-born students only. I make two additional sample restrictions in order to focus on students more likely to be DACA-eligible. First, I limit the sample to foreign-born Hispanic students. In California, over 95% of DACA applicants are Hispanic, with the vast majority born in Mexico (86%) (Brookings, 2012).[18] Second, I limit the analysis to foreign-born youth who arrived to the US by age 9. DACA requires arrival to the US by 2007. This imposes a different maximum age of US of arrival for DACA-eligibility across 9th

[16]The Migration Policy Institute constructs estimates of the undocumented population by PUMA based on adjustments to Census data.

[17]Using foreign-born non-citizens is the most common way to approximate the undocumented population in this literature (Pope, 2016; Amuedo-Dorantes and Antman, 2016; Kuka, Shenhav, and Shih, 2019).

[18]However, because the overwhelming majority of students in LAUSD are Hispanic, this sample restriction does not drop a large number of students. Of all foreign-born youth who arrived to the US by age 9 in 9th grade cohorts between 2007 and 2014, 83% are Hispanic.

grade cohorts, which is determined by each student's age in 2007. For instance, 9th grade cohorts from 2007 (i.e. the oldest cohort in my sample) were 14 in 2007, while 9th grade cohorts from 2014 (i.e. the youngest in my sample) were 9 in 2007. Thus youth who arrived by age 14 or earlier in the 2007 grade 9 cohort would have been DACA-eligible, but only those who arrived to the US prior to age 9 in the 2014 9th grade cohort would have been. By limiting my analysis to students who arrived to the US by age 9, this ensures that any foreign-born youth in my sample would have been eligible for DACA if they were undocumented regardless of their cohort. Reassuringly the results are not sensitive to conditioning on different US arrival ages, or not conditioning at all.[19]

Peer Effects Sample

To estimate the spillover effects of DACA, my sample includes only students who were born in the US. Because they were born in the US they could not be eligible for DACA. Any impact DACA had on these students is likely to be driven by policy spillovers, since to my knowledge this group did not experience any (major) changes in the returns to education over this time.

3.3 Summary Statistics

Differences across country of birth

Appendix Table A.2 presents summary statistics for 9th grade cohorts enrolled between 2007 and 2014. Columns 1 vs. 2 compare native-born students to the Hispanic foreign-born youth. The US-born population in LAUSD is majority Hispanic (75%) and Free-Lunch (65%). Compared to hispanic foreign-born youth, US-born students are less likely to be an english learner as of 9th grade, have higher achievement and are more likely to graduate from high school.

As previously noted, foreign-born youth who arrived to the US before they were 9 would have been more likely to be treated under DACA. Columns 3 vs. 4 compares foreign-born Hispanic youth based on their age at arrival to the US. Students who arrived to the US at younger ages perform significantly better on standardized exams relative to those who arrive later. While students

[19]It is important to note that because I control for 8th grade ELA test scores in all of my models, I will always limit the sample to youth who arrived to the US by ages 13-14 (i.e. the typical age of 8th graders).

who arrive before age 9 perform worse on standardized exams relative to US-born students, they perform significantly better than foreign-born youth who arrived to the US at later ages.

Differences across High School Campuses with different concentrations of Undocumented youth

Table 1 presents summary statistics that compares high school campuses with more vs. less likely undocumented students.[20] Students in campuses with higher fractions of DACA-eligible youth are more likely to be Hispanic, English Language Learners (ELL), and receiving Free or Reduced-price Lunch (FRL). They also have lower levels of educational attainment and perform worse on standardized exams. It is important to note that while my peer effects identification strategy does not require that the fraction of likely undocumented youth in a school be uncorrelated with school characteristics, it does require that the fraction of undocumented youth is uncorrelated with *changes* in outcomes that occur for any reason than the introduction of DACA. So while these differences do not pose a direct threat to my identification strategy, it is important to rule out the possibility that demographic differences do not introduce a later divergence in trends. Reassuringly, I demonstrate that my results are robust to the inclusion of time trends interacted with campus demographics (measured at baseline in the 2011-2012 school year).

4 Empirical Strategy

4.1 Direct Impact of DACA

The first objective of this paper is to determine whether the increased returns to schooling due to DACA impacted educational investments of undocumented youth in Los Angeles. If undocumented status were observed, I could compare high school completion decisions of undocumented youth (i.e. who were DACA-eligible) who exogenously experienced an increase in returns to schooling in 2012 after DACA's enactment, to a control group of foreign-born youth who experienced no change in 2012 using a standard difference-in-differences approach. However, as previously noted, I do not observe whether students are undocumented which makes it infeasible to proceed with this strategy

[20] In Section 4 I discuss how I determine the fraction of the high school campus that is likely to be undocumented.

that requires being able to determine DACA-eligibility.[21]

Instead, I leverage differences across foreign-born youth in their *likelihood* of being undocumented using the concentration of DACA applicants in their zip-code as defined in Equation 1 (see Section 3.1.2). The more foreign-born residents who applied to DACA in a student's home zip-code, the higher the corresponding likelihood that a student was undocumented, thus any effect of DACA should be increasing with the concentration of DACA applicants in one's zip-code. On the sample of all foreign-born Hispanic LAUSD students who arrived to the US by age 9, I estimate the following event-study specification to determine whether DACA's introduction increased high school completion among likely undocumented youth:

$$Y_{izsc} = \alpha_0 + \sum_{j=2007}^{2014} \alpha_j \mathbb{1}\{c = j\} \times \text{ShareEligible}_z + \lambda_1 X_{isc} + \lambda_2 Z_{sc} + \gamma_z + \phi_c + \gamma_s + \varepsilon_{izsc} \quad (2)$$

where Y_{isz} is an indicator for high school completion for foreign-born student i in 9th grade cohort c living in zip-code z. ShareEligible_z is the fixed concentration of DACA applicants in a student's home zip-code as defined in Equation 1, and is interacted with each 9th grade cohort indicator variable. I control for zip-code fixed effects, γ_z, to account for fixed cross-sectional differences across zip-codes, and cohort controls ϕ_c to account for trends in high school completion that could affect all students in Los Angeles.[22] Z_i includes individual characteristics that include age of arrival to the US, gender, disability status, and 8th grade ELA test scores.[23] Finally, Z_{sc} accounts for school

[21] This challenge is not unique to this paper. To my knowledge, there are no available datasets that contain information on undocumented status and educational outcomes for a large representative sample. The prior literature has relied on the absence of US citizenship and Hispanic ethnicity as a second best measure for undocumented status (Kaushal, 2006; Pope, 2016; Amuendo-Dorantes and Antman, 2016; Kuka et. al 2019). These papers estimate the impacts of DACA using a difference-in-difference strategy that compares Hispanic non-citizen immigrants (treated) to Hispanic citizen immigrants (control) before and after DACA's enactment. Since I only observe whether students are foreign-born, and do not observe information on citizenship status, I cannot approximate DACA-eligibility in the same way.

[22] I also control for high school, γ_s, fixed effects to account for fixed cross-sectional differences across high schools.

[23] I do not control for free-lunch status. Parents must apply for free-lunch, and those who are undocumented may be less likely to apply. I also do not include an indicator for whether a student was classified as an English Language Learner (ELL) in 9th grade. Across this time, the fraction of students classified as EL in 9th grade significantly declined due to an increase in pressure to reclassify EL students. Finally, I do not condition on 8th grade math test scores, since students can choose which version of the 8th grade math test to take in California.

by cohort demographics that include the fraction of students who are male, foreign-born, by racial group (Hispanic, White, and Black), participating in special education, as well as the total number of students in the school-cohort. These are all measured at baseline in 9th grade.

The main variables of interest, α_j, identify differences in high school completion for foreign-born youth who more vs. less likely to be undocumented for each 9th grade cohort. If DACA increased the likelihood of undocumented youth completing high school, α_j should be positive for cohorts who were expected to be enrolled in high school after DACA's enactment, since students in zip-codes with higher concentrations of DACA-applicants were more likely to have experienced an increase in returns to schooling. If the main identification assumption holds, that foreign-born youth living in areas with higher concentration of DACA applicants had similar pre-DACA trends as foreign-born youth living in areas with lower concentrations of DACA applicants, then α_c should be 0 for 9th grade cohorts who were never exposed to DACA during high school.

Next, I estimate the average impact of DACA using a difference-in-differences specification as follows:

$$Y_{izsc} = \delta_0 + \delta_1(\text{ShareEligible}_z * \text{YearsExposed}_c) + \lambda_1 Z_i + \lambda_2 Z_{sc} + \gamma_z + \phi_c + \gamma_s + \varepsilon_{izsc} \qquad (3)$$

where YearsExposed_c represents the share of time each 9th grade cohort was expected to be enrolled in high school after DACA's enactment in 2012.[24] I measure policy exposure continuously to allow the effect of DACA to be increasing with the number of years each 9th grade cohort was expected to be enrolled in high school under the policy.[25] All other variables are as previously defined.

[24]Table A.1 shows DACA exposure by each 9th grade cohort. For cohorts who were expected to graduate before DACA was introduced, YearsExposed_c takes on a value of 0. For cohorts with partial exposure during high school, YearsExposed_c take on values between 0 and 1. Those who were expected to enter 9th grade after DACA's enactment in 2012 are assigned a YearsExposed_c value of 1.

[25]For instance, students with more years of policy exposure would have had more time to adjust their behavior throughout high school in order to be able to meet high school graduation requirements. Using a post-policy indicator that equals 1 for 9th grade cohorts who were expected to have *any* exposure to DACA during high school provide similar results.

To address whether the increased returns to schooling due to DACA led to increased effort in school, I estimate a similar model that looks at yearly outcomes. Formally, I estimate

$$Y_{izctg} = \beta_0 + \beta_1(\text{ShareEligible}_z * \text{Post}_t) + \lambda_1 Z_i + \lambda_2 Z_{sc} + \phi_{sg} + \alpha_{tg} + \gamma_z + \varepsilon_{izctg} \quad (4)$$

where Y_{izctg} is a yearly outcome (i.e. test performance, attendance) from grade g in which the student was enrolled during year t. Now I interact the fixed concentration of DACA applicants in a student's 9th grade zip-code with a post-policy indicator, Post_t, which equals 1 if the outcome was measured after DACA's enactment in 2012. ϕ_{sg} and α_{tg} are school-grade and year-grade fixed effects, and all other control variables measured at baseline (i.e. 9th grade) are as previously defined. β_1 has a similar interpretation to δ_1, and will be positive if DACA led to increased effort in school.

4.1.1 Identification

My identification strategy uses changes before and after DACA's enactment in the educational outcomes of foreign-born Hispanic youth across areas with higher vs. lower concentrations of DACA applicants. The identifying assumption is that foreign-born youth living in areas with higher concentration of DACA applicants had similar pre-DACA trends as foreign-born youth living in areas with lower concentrations of DACA applicants. The results of event-study specification presented later indicate that there were no differences in educational outcomes across zip-codes with high vs. low DACA applicants for cohorts expected to graduate before DACA's enactment, providing evidence in support of this assumption.

While event-study plots provide evidence against the existence of pre-trends, an additional concern is that the underlying population of Hispanic foreign-born students in areas with high undocumented populations was changing relative to those with fewer undocumented youth. For instance, if the underlying ability of foreign-born students in high concentrations of DACA-applicants zip-codes was increasing over time, then I could be misattributing any increases in educational attainment to DACA, when it could be due to compositional changes. Reassuringly,

Table 2 provides evidence that the underlying ability of students in areas with higher concentrations of DACA-applicants was unlikely to be changing endogenously. I find little evidence that predicted high school completion,[26] student demographics, or baseline achievement are correlated with policy exposure, conditional on 9th grade cohort and zip-code fixed effects.

4.2 Spillover Effects of DACA

Next, I leverage the introduction of DACA to determine whether the increased returns to schooling for undocumented youth impacted their peers. The impact of DACA differs across US-born students for two reasons. First, 9th grade cohorts differ in whether they were enrolled in school after DACA's enactment. Those enrolled in school afterwards would have interacted with undocumented peers experiencing an exogenous increase in the returns to schooling. Second, students with higher concentrations of undocumented students in their school would be more affected.

To estimate whether the educational investments of US-born students was affected by the increased returns to schooling of their undocumented peers, I leverage these two sources of variation in a difference-in-difference estimation set-up. Specifically, I focus on the 2012 introduction of DACA, wherein the control group consists of US-born students without any peers who were likely DACA-eligible, and the treatment effect varies across US-born students in the fraction of their peers likely to be DACA-eligible. Specifically, I estimate the following event-study specification:

$$Y_{isc} = \vartheta_0 + \sum_{j=2007}^{2014} \vartheta_j \mathbb{1}\{c = j\} \times \text{DACAShare}_{sc} + \lambda_1 X_{isc} + \lambda_2 Z_{sc} + \gamma_s + \phi_c + \varepsilon_{isc} \tag{5}$$

where Y_{isc} is an indicator for high school completion for US-born student i in 9th grade cohort c in high school s. DACAShare_{sc} is the fraction of students in a school and 9th grade cohort who were

[26] To compute predicted outcomes, first, I estimate whether predicted high school completion is correlated with policy exposure (i.e. $\text{ShareEligible}_z * \text{YearsExposed}_c$). To do so, I first regress high school completion on all covariates included in Equation 3, but exclude policy exposure. Then, using the coefficients from this model, I predict high school completion for each student. Finally, I regress predicted high school graduation on policy exposure, conditional on zip-code and cohort fixed effects. .

estimated to be DACA-eligible,[27] and is interacted with each 9th grade cohort indicator. Z_i includes individual characteristics that include race, gender, gender-race interactions, special education status, and 8th grade ELA test scores.[28] Finally, Z_{sc} accounts for school by cohort demographics that include the fraction of students who are male, foreign-born, by racial group (Hispanic, White, and Black), receiving special education, as well as the total number of students in the school-cohort, all measured as of 9th grade. The main variables of interest, ϑ_j, identify differences in high school completion for US-born youth with higher vs. lower shares of DACA-eligible peers.

As previously noted, I do not observe whether students are undocumented so I focus on the share of a student's peers who were *likely* DACA-eligible defined as follows:

$$\text{DACAShare}_{sc} = \text{FBShare}_{sc} \times \text{ShareEligible}_{sc} \tag{6}$$

FBShare_{sc} is the fraction of Hispanic foreign-born youth who arrived to the US by age 9 in a given high school and 9th grade cohort. As justified in Section 3.2, these students were more likely to be DACA-eligible. To further capture the likelihood that these foreign-born students were undocumented, I scale FBShare_{sc} by a factor ($\text{ShareEligible}_{sc}$) which accounts for the fact that not all foreign-born students are undocumented. This is calculated by averaging the concentration of DACA applicants across the zip-codes of all foreign-born students in a campus-cohort.[29]

Next, I estimate the average effect of DACA on US-born students using a difference-in-differences specification as follows:

[27] I discuss how this is computed in detail in the next paragraph.

[28] Again, I do not control for EL status as of 9th grade given the downward trend in EL participation over this period. I also do not control for an FRL indicator, as there were changes in FRL eligibility criteria over this period. However, my results provide similar results when I control for both EL stats and FRL status.

[29] Formally,

$$\text{ShareEligible}_{sc} = \left(\frac{\sum_{z=n}^{N} \text{n}_{scz} \times \text{ShareEligible}_{z}}{\text{n}_{sc}} \right)_{sc} \tag{7}$$

where n_{scz} indicates the number of foreign students living in a given zip-code and n_{sc} indicates the number of foreign-born students in a school-cohort. ShareEligible_{z} is the fixed concentration of DACA applicants in a student's home zip-code as defined in Equation 1.

$$Y_{isc} = \rho_0 + \rho_1(\text{DACAShare}_{sc} * \text{FracExposed}_c) + \lambda_1 X_{isc} + \lambda_2 Z_{sc} + \gamma_s + \phi_c + \varepsilon_{isc} \quad (8)$$

where FracExposed_c represents the share of time each 9th grade cohort was expected to be enrolled in high school after DACA's enactment in 2012.[30] All other variables are as previously defined. The coefficient of interest, ρ_1, represents the peer effects stemming from the share of students in one's 9th grade cohort and school who were likely DACA-eligible. If the increased returns to schooling among undocumented youth due to DACA had positive spillover effects on the high school completion decision of their peers, ρ_1 should be positive.

To address whether the increased returns to schooling of undocumented youth also impacted the intermediate outcomes of peers, I estimate a similar difference-in-difference model that looks at yearly achievement and behavioral outcomes. Formally, I estimate:

$$Y_{isctg} = \gamma_0 + \gamma_1(\text{DACAShare}_{sc} * \text{Post}_t) + \lambda_1 Z_i + \lambda_2 Z_{sc} + \phi_{sg} + \alpha_{tg} + \varepsilon_{iscgt} \quad (9)$$

where Y_{isctg} is a yearly outcome from grade g in which the student was enrolled during year t. Now I interact the fixed concentration of likely-DACA eligible peers in a student's 9th grade cohort-campus with a post-policy indicator, Post_t, which equals 1 if the outcome was measured after DACA's enactment in 2012. ϕ_{sg} and α_{tg} are school-grade and year-grade fixed effects, and all other control variables measured at baseline (i.e. 9th grade) are as previously defined. γ_1 has a similar interpretation to ρ_1, and should be positive if DACA's had positive spillover effects on the yearly academic and behavioral outcomes of US-born students.

[30] Again, this allows for the effect of DACA to be increasing with the number of years of policy exposure. However, using a post-policy indicator for any exposure to DACA during high school provide similar results.

4.2.1 Identification

This strategy leverages differences in outcomes across US-born students with higher and lower concentrations of likely DACA-eligible peers before and after DACA's enactment. Thus, the identifying assumption is that students with more DACA-eligible peers had similar counterfactual trends relative to students with fewer DACA-eligible peers. The results of my baseline event-study specification presented later indicate little differences in educational outcomes across schools with more vs. fewer DACA-eligible peers, providing evidence in support of this assumption.

While event-studies provide evidence against the existence of pre-trends in educational outcomes, there is still a possibility that compositional changes could have led to a later divergence in trends. For example, my estimates would be biased if US-born students in schools with higher concentrations of DACA-eligible peers were becoming higher achieving over time for reasons unrelated to DACA. I find little evidence that predicted high school completion,[31] student demographics (except for being black), or baseline achievement are correlated with policy exposure, condition on high school campus and cohort fixed effects. These results are presented in Table 6, and indicate a nonsignificant relationship between exposure to DACA-eligible peers and these demographics. Thus, these results suggest little evidence that US born students in campuses with high concentrations of DACA-eligible students were becoming higher achieving over time.

5 Results

First, I examine whether DACA led to increases in high school enrollment, completion, and effort among likely undocumented youth in Los Angeles. Finding that DACA led to significant increases in educational investments of undocumented youth, I then ask whether the increases in peer motivation due to DACA had any impact on their peers' educational investments.

5.1 Direct Effects

Enrollment and Graduation Results

[31] I follow the same steps outlined in Section 4.1.1 to construct predicted high school completion.

I first test whether DACA led to increases in high school enrollment and completion for undocumented youth. Specifically, for foreign-born Hispanic youth arriving to the US by age 9, I examine the relationship between the likelihood of being undocumented (i.e. ShareEligible$_z$) and 12th grade enrollment or high school completion for each 9th grade cohort separately with event-study plots. Figure 2 plots the full set of α_j from Equation 2 where the outcome is an indicator for 12th grade enrollment (Panel A) or completed high school (Panel B). Students more likely to be undocumented in cohorts expected to graduate before DACA's enactment were not more likely to be enrolled or complete high school.[32] However, likely undocumented youth in cohorts exposed to the policy during high school were more likely to stay enrolled in school and complete high school, with the largest increase for the 9th grade cohort most exposed to DACA.

To quantify the magnitude of these effects, I turn to the difference-in-differences estimates. Table 3 provides estimates of β_1 from Equation 3 where the outcome variable is an indicator for whether a student was enrolled in 10th grade, 11th grade, 12th grade or high school completion, respectively. Starting with a model that only includes 9th grade cohort indicators and zip-code fixed effects, I successively add controls. The estimated effects are largely stable to choice of specification. DACA led to significant increases in the likelihood of being enrolled in high school enrollment (i.e. during grades 10-12) and high school completion. In the fully specified model, these estimates suggest that students who were undocumented are about 8 p.p. more likely to be enrolled in 12th grade and 8 p.p. more likely to complete high school after DACA's enactment.[33]

Intermediate Outcomes

Next, I examine whether DACA led to increases in achievement for undocumented youth. Again, I start with event-study plots that plot the relationship between the likelihood of being undocumented (i.e. ShareEligible$_z$) and academic outcomes in each year separately. Figure 3 plots the full set

[32]The point estimates for these cohorts expected to graduate high school before DACA's enactment are not statistically significant. However, there appears to be a slight downward trend (i.e. enrollment and completion of likely undocumented foreign-born students was trending down leading up to the introduction of DACA). If anything, this downward trend would bias me against finding a positive effect of DACA on likely undocumented youth.

[33]The effect size can also be computed for the average Hispanic foreign-born student in my sample. This can be achieved by multiplying the coefficient by the mean of ShareEligible$_{sc}$, which was 0.34.

of coefficients from a slightly modified version of Equation 4 where Post_t is replaced with year dummies, and the outcome is standardized ELA exam (Panel A) or semester GPA (Panel B). Both plots demonstrate similar patterns. Before DACA's enactment in 2012, there was little difference in achievement between those who were more and less likely to be DACA-eligible. However, after 2012 students who were more likely to be undocumented experienced significant improvements in achievement. The gains in ELA standardized test achievement are particularly large.

To quantify the magnitude of these effects, I turn to the difference-in-differences estimates. Table 4 provides estimates of β_1 from Equation 4 where the outcome variable is the yearly attendance rate, a yearly indicator for whether a student had an in or out of school suspension, semester GPA as of Spring Quarter (on a scale of 0-4), and performance on the standardized ELA exam (standardized within a grade and year to have a mean of zero and a standard deviation of one), respectively, for Hispanic foreign-born who arrived to the US by age 9. All of these outcomes are measured yearly between 9th and 11th grade.[34]

Starting with a model that only includes campus-grade, year-grade, and zip-code fixed effects, I successively add controls. The estimated effects are largely stable to choice of specification. DACA did not impact attendance rates or the likelihood of being disciplined. However, I find a positive significant impact of DACA on academic performance. In the fully specified model, these estimates suggest that undocumented students experience an improvement in GPA of 0.16 points (off of a mean of 2.137) and a 0.23 standard deviation increase in ELA standardized test performance.[35]

5.1.1 Heterogeneous Responses

I next stratify the sample by gender, country of origin, and baseline achievement (G8 ELA test scores). Table 5 focuses on Hispanic foreign-born youth who arrived by age 9 across these different

[34] As just presented, DACA led to increases in the likelihood undocumented students were enrolled in school. However, as I will demonstrate later, DACA led to increases in enrollment for the lowest achieving students. Thus, if anything, this change in the sample would bias me against finding a positive effect of DACA on yearly outcomes.

[35] I do not look at performance on math exams, since after 7th grade students do not take the same version of the math exam (i.e. there are several different levels offered for students in the same grade). Again, the effect size can be computed for the average Hispanic foreign-born youth in my sample by multiplying the coefficient by 0.34.

groups. The effects for high school enrollment and completion are driven by men, are larger when focused on only students from Mexico (who are more likely to be DACA-eligible), and for lower achieving students (i.e. the bottom half based on 8th grade ELA test scores).

In terms of standardized ELA test performance, there is little difference across gender and country of origin. For all groups I find that DACA led to increases in standardized ELA test score performance. However, the effects on standardized ELA performance are driven by students who were higher achieving at baseline. The larger estimated effects for ELA achievement for higher achieving students suggest that the introduction of DACA may have affected higher achieving students on the margin of college enrollment. I find that increases in GPA are larger for students from Mexico and driven by students who were lower achieving at baseline.

5.2 Peer Effects

Having documented significant increases in both educational attainment and academic achievement for likely undocumented youth due to DACA, I next turn to estimating whether this increase in academic effort affected their US-born peers who were not DACA-eligible.

Enrollment and Graduation Results

I begin by documenting whether exposure to undocumented peers after DACA's enactment led to changes in high school enrollment and completion for US-born students. I start by examining the relationship between the fraction of undocumented peers (i.e. DACAShare_{sc}) and high school enrollment or completion for each 9th grade cohort separately with event-study plots. Figure 4 plots the full set of ϑ_j from Equation 5 where the outcome is an indicator for 12th grade enrollment. Figure 5 plots the full set of ϑ_j from Equation 5 where the outcome is an indicator for high school completion. Both plots demonstrate very similar patterns. There is little difference in the likelihood of high school enrollment or completion for students with higher concentrations of undocumented peers before DACA's enactment. However, students with higher concentrations of undocumented peers in cohorts who were expected to be enrolled in high school after DACA's enactment were significantly more likely to stay enrolled and complete high school. These patterns are particularly

striking for students in the bottom quartile of 8th grade achievement, who were most affected by DACA peer exposure (presented in Panel B of both Figures 4 & 5).

To quantify the magnitude of these effects, I turn to difference-in-differences estimates. Table 7 provides estimates of δ_1 from Equation 8 where the outcome variable is either an indicator for whether a student was enrolled in 10th grade, 11th grade, 12th grade or completed high school. Starting with a model that only includes 9th grade cohort indicators and campus fixed effects, I successively add controls. My estimated effects are largely stable to choice of specification. After DACA's enactment, US-born students with more undocumented peers are significantly more likely to remain enrolled in school until 12th grade.[36] These results suggest that for students with the average number of undocumented peers (2 percent of their campus-cohort), experienced a 2 p.p. (or 3 percent) increase in the likelihood of being enrolled in 12th grade. I also find that high school completion increases for students with more undocumented peers after DACA's enactment. My results suggest that students with the average number of undocumented peers experienced a 2 p.p. (or 4 percent) increase in the likelihood of completing high school after DACA was enacted.

Intermediate Outcomes

Next, I examine whether exposure to higher concentrations of undocumented peers after DACA led to increases in achievement for US-born students. Again, I start with event-study plots that plot the relationship between the fraction of undocumented peers (i.e. DACAShare_{sc}) and academic outcomes in each year separately. Figure 6 plots the full set of coefficients from a slightly modified version of Equation 9 where Post_t is replaced with year dummies, and the outcome is standardized ELA exam performance. Before DACA's enactment in 2012, there was little difference in achievement between US-born students with more and less undocumented peers. After 2012 students with higher concentrations of undocumented peers experienced significant improvements in ELA

[36] find a positive but not statistically significant relationship between exposure to undocumented peers and being enrolled in 10th grade and a positive and marginally slightly significant for 11th grade. As students are required to be enrolled in school until they are 16 (which for most students occurs late in 11th grade or shortly afterwards), these patterns (i.e. a non-significant relationship for 10th, weaker relationship for 11th grade, but a significant relationship for 12th grade) are consistent with students waiting to drop-out until they are legally able to do so.

achievement. This time, however, the effects are driven by students who were higher achieving at baseline (measured in 8th grade).

To quantify the magnitude of these effects, I turn to difference-in-differences estimates. Table 8 presents yearly outcomes between 9th grade and 11th grade. Panel A and B of Table 8 provides estimates of β_1 from Equation 9 where the outcome variable is yearly attendance rates or an indicator for whether a student was disciplined within a year. I find that exposure to more undocumented peers post-DACA did not affect these outcomes. I do however find that DACA led to increases in achievement among US-born students. Panel C of Table 8 provides estimates of β_1 from Equation 9 where the outcome variable is Semester GPA. In the fully specified model, I find that students with the average number of undocumented peers (2 percent of the campus-cohort) experienced a 3 point increase in their GPA (off of a mean of 2.201) after DACA's enactment.

Next, I turn to the impact on standardized test-scores. To address the fact that DACA led to changes in enrollment, I start by examining whether DACA led to changes in the composition of test-takers. Panel D of Table 8 provides estimates of β_1 from Equation 9 where the outcome variable is an indicator for whether a student had a missing ELA standardized test score. This outcome is equal to 1 if students were not enrolled *or* if they were enrolled, but did not take the standardized exams in that particular year. While these coefficients are negative (implying that after DACA's enactment students in high concentration schools were less likely to have a missing exam), this coefficient is not statistically signifiant or economically meaningful. This insignificant relationship suggests that the composition of test-takers was not significantly changing, even despite DACA increasing the likelihood students continued to be enrolled in school.[37]

Panel E of Table 8 provides estimates of β_1 from Equation 9 where the outcome variable is performance on the ELA standardized exam, standardized within grade and year to have a mean of zero and a standard deviation of one. The introduction of DACA led to a large statistically

[37] In addition, as previously noted when discussing the direct effects, DACA induced lower-achieving students to stay enrolled in school. Thus, if anything, any changes in the composition of test-takers is likely to bias me against finding a positive impact of DACA on achievement outcomes.

significant increase on the ELA standardized test performance of US-born students. My results suggest that US-born students with the average number of likely undocumented peers (2 percent of their campus-cohort), experienced a 0.07 standard deviation increase in ELA standardized test performance.

5.2.1 Heterogeneous Responses

I next stratify the sample by gender, race, and baseline achievement (based on 8th grade ELA test scores). Table 9 focuses on US-born students across these different groups. The spillover effects of DACA on high school completion and enrollment are driven by Black and lower-achieving US-born students. In terms of ELA achievement, I find that Hispanic and higher-achieving US-born students were most affected by the increase in academic effort of their undocumented peers. The fact that higher-achieving US-born students were most affected in terms of achievement suggests that the introduction of DACA also affected students more likely to be on the margin of college enrollment.

5.3 Robustness

Thus far, I have assumed that the peer effects results are solely being driven by exposure to more motivated peers through the new educational incentives introduced by DACA for undocumented students. However, one may worry that other changes around this time could have influenced the educational attainment outcomes that I focus on. One policy change that I are aware of around this time was the elimination of the high school exit exam in 2015.[38] If schools with higher concentrations of DACA-eligible students were also most likely to be positively impacted by the elimination of the high school exit exam, then it is possible I may be misattributing the increases in high school completion to more motivated peers. I estimate Equation 5 including time trends that vary by the fraction of students who were unable to pass the high school exit exam on their first attempt in 10th grade in 2013 (the year DACA was enacted). Appendix Table A.3 presents results for the high school outcome variable and demonstrate that the estimates are robust to the inclusion

[38]That is, for cohorts expected to graduate high school after 2015, they were no longer required to pass the math and english high school exit exams in order to be able to graduate.

of such trends. This suggests that even after controlling for campuses that would have been more or less impacted by the elimination of the high school exit exam, I still find a positive and robust relationship between the concentration of DACA-eligible peers on high school completion.

I also test the robustness of these results to how I account for the likelihood that a given foreign-born student was undocumented. Table 10 presents peer effects results which account for the likelihood that the foreign-born youth in a campus-cohort were undocumented in several different ways. Column 1 reports my baseline model that scales the fraction of foreign-born youth in one's 9th grade cohort and campus by the zip-code DACA-application rate (i.e. uses Equation 6 to define DACA peer-exposure). Column 2 scales the fraction of a campus-cohort who was foreign-born by the fraction of undocumented youth estimated to be living in a PUMA (MPI). Column 3 scales the fraction of a campus-cohort who was foreign-born by the fraction of non-citizens in a zip-code (ACS).[39] Finally, Column 4 just uses the fraction of foreign-born hispanic students in a campus-cohort to define peer exposure. Reassuringly, my results yield similar conclusions using different adjustments to account for the undocumented population (Columns 2-3). The much smaller and less significant estimates in Column 4 suggest that without scaling by geographic differences in the undocumented population I might not be able to uncover the true impact of DACA.

Finally, I employ an alternative individual fixed effects empirical strategy to check the robustness of our findings for outcomes that vary yearly (i.e. GPA, attendance, disciplinary actions). Specifically, I run an individual fixed effects model of the following form:

$$Y_{isct} = \delta_0 + \delta_1(\text{DACA Peer Exposure})_{sct} + \gamma_i + \phi_{gt} + \varepsilon_{isct} \tag{10}$$

where γ_i and ϕ_{gt} are individual and grade-year fixed effects respectively. Now the DACA Peer exposure is the number of cumulative years of exposure to DACA since 9th grade. For this analysis, I limit my focus to the three years following 9th grade when there was minimal differential

[39]Because some non-citizens have green cards or temporary visas, again I would be capturing youth who are not undocumented in this measure. However, for Hispanic foreign-born youth who I are focused on, Kuka et. al (2018) estimate that 72% of all Hispanic non-citizens are undocumented, suggesting this may be a reliable proxy.

attrition from the sample. Further, I limit the analysis to those students who were enrolled in high school during these three years. Table A.4 presents these results. For the most part, these results are consistent with the previous measures that rely on the within-cohort and across campus variation to estimate the impact of DACA on peer outcomes presented in Section 5.2. While I find that exposure to DACA-eligible peers after DACA's enactment led to a statistically significant increase in the likelihood of being disciplined and a statistically significant decrease in semester GPA, both effects are not economically meaningful. The estimates imply that DACA led to a 0.002 increase in the probability of being disciplined and a .04 point decrease in semester GPA (on a scale of 4) for non-eligible peers. I do, However, find that exposure to DACA-eligible peers after DACA's enactment led to a statistically significant and economically meaningful increase in the ELA standardized exams. The estimate of 1.740 imply that on average, for a student with 3 percent of DACA-eligible peers, after DACA ELA standardized exam scores increased by .05 of a standard deviation. These effect is nearly identical to the one estimated above in Section 5.2 and presented in Table 8.

Conclusion

In this paper, I present evidence on how DACA affects educational attainment. Specifically, I focus on how DACA increased the educational attainment of those who were directly eligible, and also for their ineligible peers . My identification strategy is based on the enactment of DACA in 2012, which increased the returns to a high school diploma for undocumented youth. To estimate whether DACA had positive spillovers on peers, I leverage variation in the concentration of DACA-eligible youth across Los Angeles schools. In summary, I find that students in campuses with more DACA-eligible peers were significantly more likely to graduate and perform better in school after DACA's enactment.

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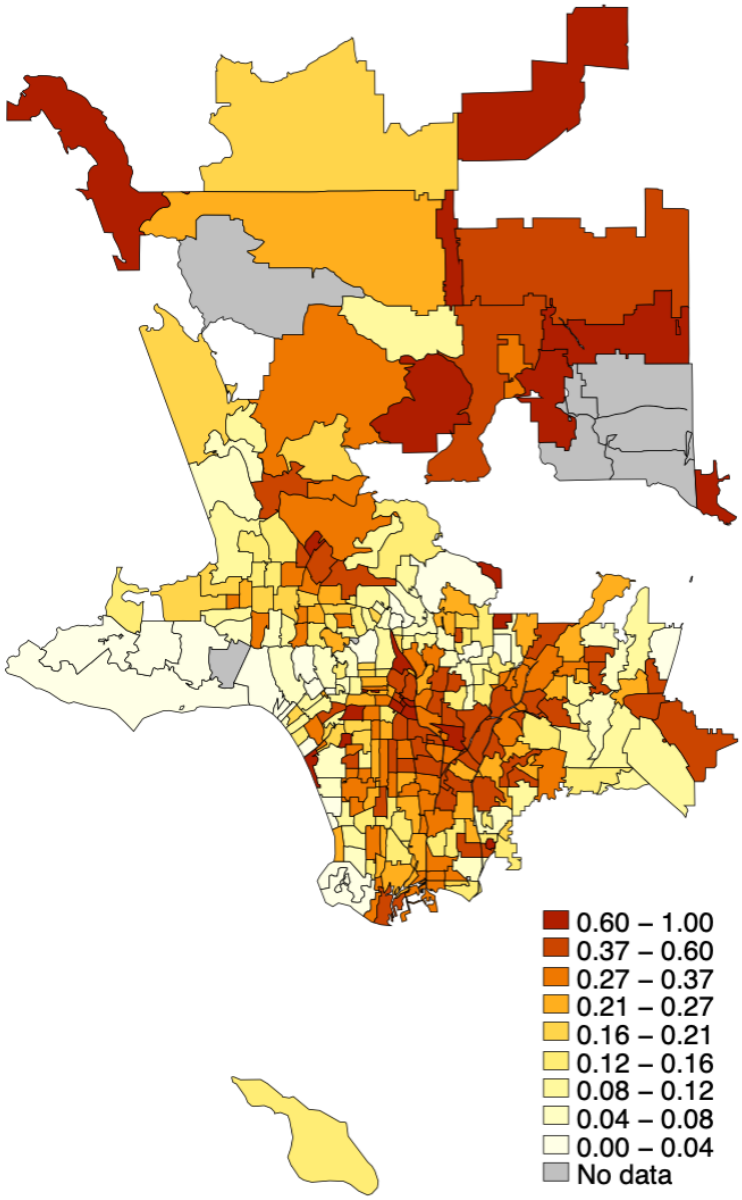
Figures/Tables

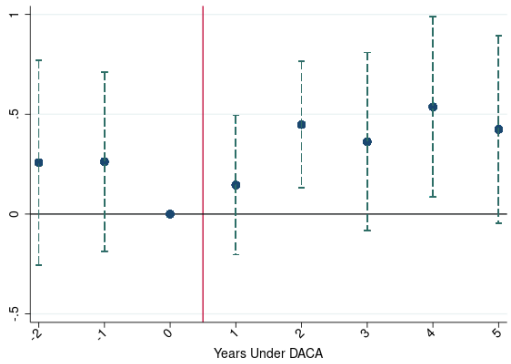
Figure 1: Fraction of Foreign-Born Population Ages 15-19 who applied to DACA, 2012-2013



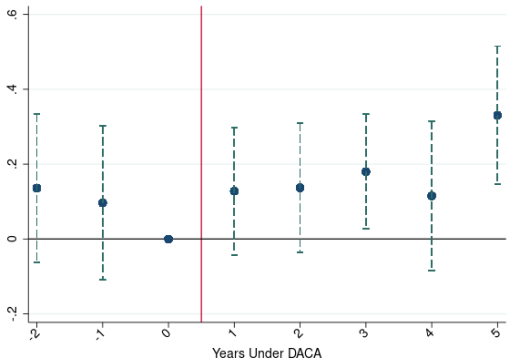
Note: This plot shows the share of foreign-born students (ages 15-19) who applied to DACA in each Los Angeles zip code (ShareEligible_z). This is computed using Equation 1.

Figure 2: Event Study Estimates of the Direct Impact of DACA on High School Enrollment and Completion, Foreign-born Hispanics

(a) Enrolled in 12th Grade



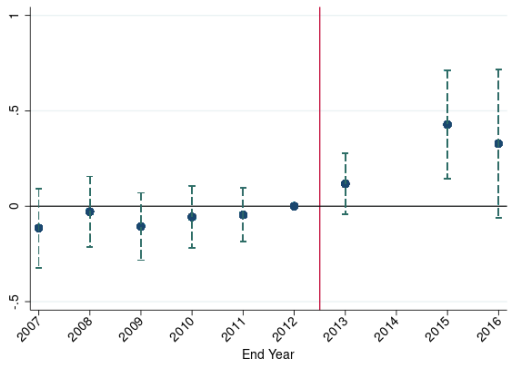
(b) High School Completion



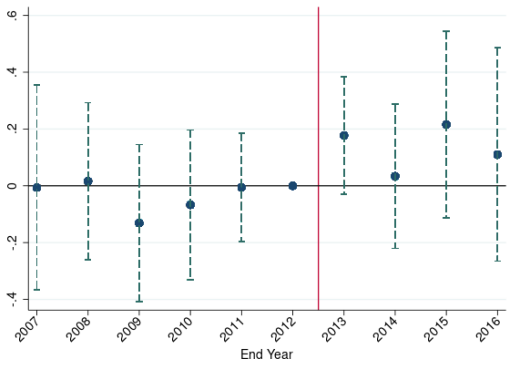
Note: These figures plot coefficients and 95% confidence intervals from event-study regressions that estimate interactions between 9th grade cohort dummies and ShareEligible$_z$. The dependent variable is shown in the sub-figure labels. Event time is computed by subtracting 12 from the grade each 9th grade cohort was expected to be enrolled in during the year right before the policy was implemented (or the 2011-12 school year). The sample includes foreign-born Hispanic students who arrived to the US by age 9 in 9th grade cohorts between 2006-07 to 2013-14. The 9th grade cohort from 2008-09 is omitted, so estimates are relative to that unexposed cohort. See Table 3 for more detail on the sample and the full set of controls. Standard errors are clustered by zip-code.

Figure 3: Event Study Estimates of the Direct Impact of DACA on Achievement, Foreign-born Hispanics

(a) ELA Standardized Exams

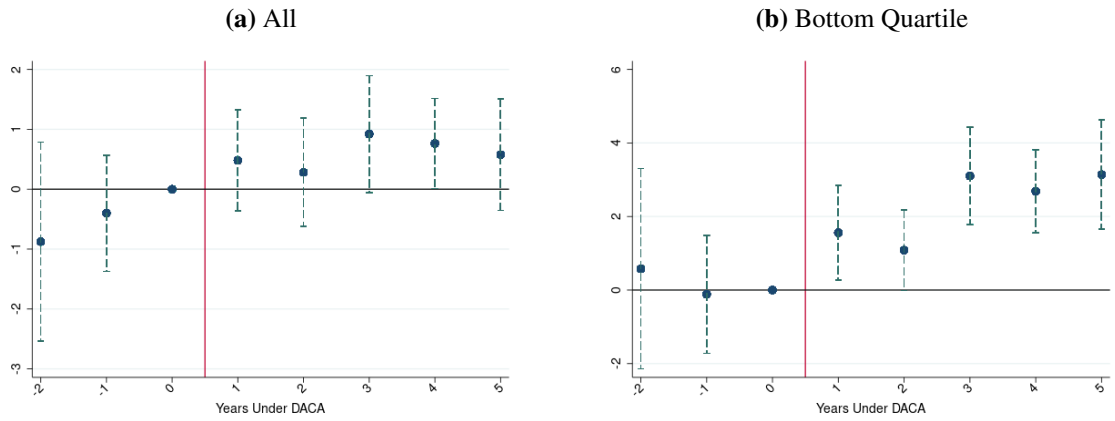


(b) GPA



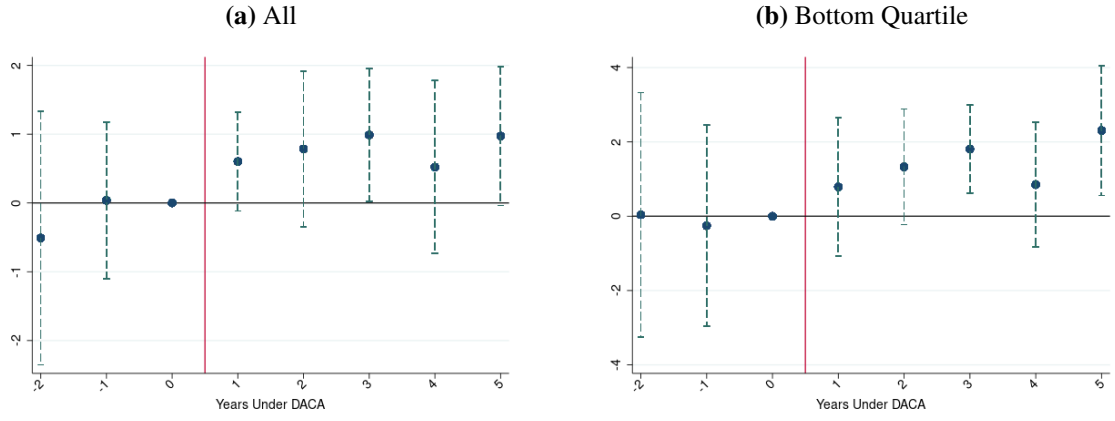
Note: These figures plot coefficients and 95% confidence intervals from event-study regressions that estimate interactions between year dummies and ShareEligible$_z$. The dependent variable is shown in the sub-figure labels. The sample includes foreign-born Hispanic students who arrived to the US by age 9 in 9th grade cohorts between 2006-07 to 2013-14. The 2011-12 school year is omitted, so estimates are relative to this pre-policy year. See Table 3 for more detail on the sample and the full set of controls. Standard errors are clustered by zip-code.

Figure 4: Event Study Estimates of the Spillover Effects of DACA on 12th Grade Enrollment, US-born Students



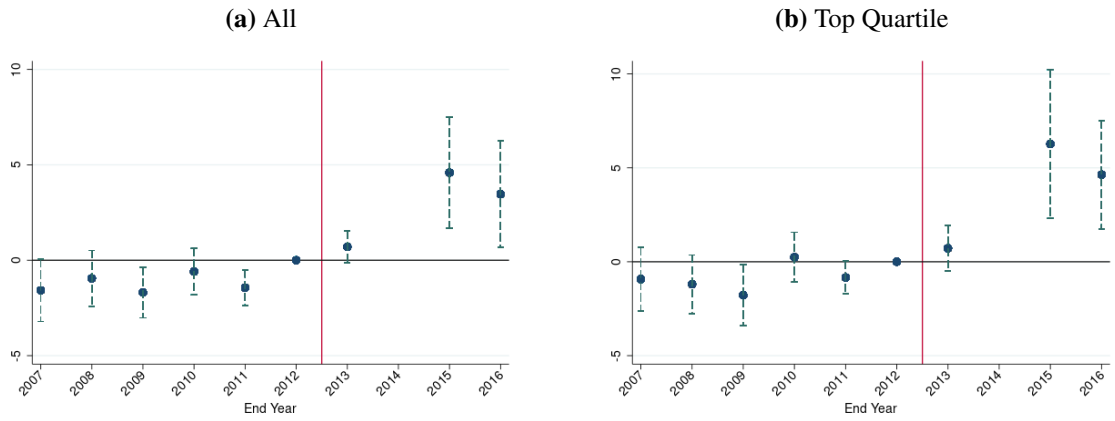
Note: These figures plot coefficients and 95% confidence intervals from event-study regressions that estimate interactions between 9th grade cohort dummies and DACAShare$_{sc}$. The dependent variable is an indicator for whether a student was enrolled in 12th grade. The subsample is shown in the sub-figure labels. Event time is computed by subtracting 12 from the grade each 9th grade cohort was expected to be enrolled in during the year right before the policy was implemented (or the 2011-12 school year). The sample includes US-born youth in 9th grade cohorts between 2006-07 to 2013-14. The 9th grade cohort from 2008-09 is omitted, so estimates are relative to that unexposed cohort. See Table 7 for more detail on the sample and the full set of controls. Standard errors are clustered by high school.

Figure 5: Event Study Estimates of the Spillover Effects of DACA on High School Completion, US-born Students



Note: These figures plot coefficients and 95% confidence intervals from event-study regressions that estimate interactions between 9th grade cohort dummies and DACAShare$_{sc}$. The dependent variable is an indicator for whether a student completed high school. The subsample used is shown in the sub-figure labels. Event time is computed by subtracting 12 from the grade each 9th grade cohort was expected to be enrolled in during the year right before the policy was implemented (or the 2011-12 school year). The sample includes US-born youth in 9th grade cohorts between 2006-07 to 2013-14. The 9th grade cohort from 2008-09 is omitted, so estimates are relative to that unexposed cohort. See Table 7 for more detail on the sample and the full set of controls. Standard errors are clustered by high school.

Figure 6: Event Study Estimates of the Impact of DACA on Achievement, US-born Students



Note: These figures plot coefficients and 95% confidence intervals from event-study regressions that estimate interactions between year dummies and DACAShare$_{sc}$. The dependent variable is shown in the sub-figure labels. The sample for these plots include all US-born students. The sample includesUS-born youth in 9th grade cohorts between 2006-07 to 2013-14. The 2011-12 school year is omitted, so estimates are relative to this pre-policy year. See Table 7 for more detail on the sample and the full set of controls. Standard errors are clustered by high school.

Table 1: Characteristics of Schools by the Concentration of Undocumented Peers in 9th Grade cohorts from 2012-2013

	DACA Concentration		
	<= 1%	1 - 5%	5% +
Demographics			
Asian	0.06	0.04	0.01
Black	0.17	0.13	0.04
Hispanic	0.51	0.71	0.90
White	0.16	0.09	0.03
Male	0.53	0.51	0.53
Foreign-Born	0.10	0.15	0.19
Ever English Learner	0.27	0.48	0.65
Free/Reduced Price Lunch	0.48	0.58	0.66
Outcomes			
Graduated HS	0.63	0.64	0.55
Passed HS Exit First Attempt (ELA)	0.77	0.75	0.66
Passed HS Exit First Attempt (Math)	0.78	0.76	0.70
Std ELA score (G11)	0.12	0.11	-0.10
Std ELA score (G8)	0.18	0.04	-0.24
Number of Campuses	53	67	66
Average Cohort Size	342	547	448
Total Students	3,924	23,663	14,324

Note: DACA-eligible concentration is calculated as the number of Hispanic foreign-born youth who arrived to the US by age 9 estimated to be undocumented in 9th grade cohorts from 2012-2013 (the first year after DACA's enactment), divided by the total number students in each campus-cohort.

Table 2: The Effect of DACA on Predicted High School Completion and Exogenous Student Characteristics, Foreign-born Hispanics

	Predicted HS Grad	Age at US Arrival	Special Education	Male	Std ELA (G7)	Std Math (G7)	Std ELA (G8)
ShareEligible∗	0.0305	-0.0438	-0.0463	-0.0109	0.0737	-0.0233	-0.00569
YearsExposed	(0.0344)	(0.202)	(0.0358)	(0.0469)	(0.0885)	(0.103)	(0.111)
Mean (Y)	0.601	6.002	0.0709	0.507	-0.193	-0.0806	-0.216
N	22,255	22,255	22,255	22,255	21,174	21,160	22,255
Controls							
Cohort FE	X	X	X	X	X	X	X
Zip FE	X	X	X	X	X	X	X
Campus FE	X	X	X	X	X	X	X

Note: This table contains results obtained from regressing predicted high school completion and student demographics on $(\text{ShareEligible}_z * \text{YearsExposed}_c)$. The sample for these regressions are foreign-born Hispanic students who arrived to the US by age 9 and were in 9th grade cohorts from 2006-07 to 2013-14. See Table 3 for more detail on the sample and the full set of controls. Standard errors in parentheses are clustered by residence zip-code. *p<0.10, ** p<0.05, *** p<0.01.

Table 3: The Effect of DACA on School Attendance and High School Completion, Foreign-born Hispanics

	(1)	(2)	(3)	(4)
Panel A: Enrolled in 10th Grade				
ShareEligible*YearsExposed	0.0757**	0.0742**	0.0735**	0.0686**
	(0.0305)	(0.0307)	(0.0307)	(0.0310)
Mean (Y)	0.915	0.915	0.915	0.915
Panel B: Enrolled in 11th Grade				
ShareEligible*YearsExposed	0.0715**	0.0693**	0.0681**	0.0729**
	(0.0312)	(0.0312)	(0.0309)	(0.0313)
Mean (Y)	0.853	0.853	0.853	0.853
Panel C: Enrolled in 12th Grade				
ShareEligible*YearsExposed	0.0915***	0.0888**	0.0872**	0.0866**
	(0.0347)	(0.0351)	(0.0347)	(0.0344)
Mean (Y)	0.769	0.769	0.769	0.769
Panel D: Graduated from High School				
ShareEligible*YearsExposed	0.0896**	0.0853*	0.0863**	0.0794*
	(0.0439)	(0.0445)	(0.0433)	(0.0430)
Mean (Y)	0.578	0.578	0.578	0.578
N	22,255	22,255	22,255	22,255
Controls				
Cohort FE	X	X	X	X
Zip FE	X	X	X	X
Campus FE	X	X	X	X
Demographics		X	X	X
8th Grade Std Test (ELA)			X	X
Campus-Cohort Demographics				X

Note: This table contains results obtained from regressing indicators for enrollment and high school graduation on $(\text{ShareEligible}_z * \text{YearsExposed}_c)$. The sample for these regressions are foreign-born Hispanic students who were in 9th grade cohorts from 2006-07 to 2013-14 who arrived to the US by age 9. Individual controls include age of arrival to the US, gender, whether a student was enrolled in special education, and 8th grade ELA achievement. District demographic cohort controls include the percentage of students in the cohort belonging to each racial group, receiving special education, and who are male. Standard errors in parentheses are clustered at the zip-code level. *p<0.10, ** p<0.05, *** p<0.01.

Table 4: The Effect of DACA on Yearly Outcomes, Foreign-born Hispanics

	(1)	(2)	(3)	(4)
Panel A: Yearly Attendance Rate				
ShareEligible*YearsExposed	-0.00601	-0.00662	-0.00689	-0.00633
	(0.00853)	(0.00843)	(0.00855)	(0.00866)
Mean (Y)	0.931	0.931	0.931	0.931
N	58,540	58,540	58,540	58,540
Panel B: Ever Disciplined				
ShareEligible*YearsExposed	-0.00283	-0.00285	-0.00241	-0.00268
	(0.0117)	(0.0116)	(0.0118)	(0.0122)
Mean (Y)	0.043	0.043	0.043	0.043
N	61,387	61,387	61,387	61,387
Panel C: Semester GPA				
ShareEligible*YearsExposed	00.172	0.173	0.162*	0.166*
	(0.110)	(0.111)	(0.0914)	(0.0901)
Mean (Y)	2.137	2.137	2.137	2.137
N	59,215	59,215	59,215	59,215
Panel D: Standardized Exam Performance (ELA)				
ShareEligible*YearsExposed	0.228**	0.195*	0.228***	0.232***
	(0.109)	(0.110)	(0.0668)	(0.0665)
Mean (Y)	-0.127	-0.127	-0.127	-0.127
N	42,162	42,162	42,162	42,162
Controls				
Cohort FE	X	X	X	X
Zip FE	X	X	X	X
Campus FE	X	X	X	X
Demographics		X	X	X
8th Grade Std Test (ELA)			X	X
Campus-Cohort Demographics				X

Note: This table contains results obtained from regressing yearly attendance rates, indicators for ever being disciplined (i.e. in or our of school suspensions only), Semester Spring GPA, and standardized ELA test performance on $(\text{ShareEligible}_z * \text{YearsExposed}_c)$. The sample for these regressions are foreign-born Hispanic students who were in 9th grade cohorts from 2006-07 to 2013-14 who arrived to the US by age 9. See Table 3 for more detail on the sample and the full set of controls. Standard errors in parentheses are clustered by residence zip-code. *p<0.10, ** p<0.05, *** p<0.01.

Table 5: The Heterogenous Effects of DACA on School Attendance and High School Completion, Foreign-born Hispanics

					8th Grade ELA Score	
	Full	Mexican	Female	Male	(Bottom 50)	(Top 50)
Panel A: Enrolled in 12th Grade						
ShareEligible*YearsExposed	0.0872**	0.0902**	0.0141	0.148***	0.157***	0.00382
	(0.0347)	(0.0386)	(0.0534)	(0.0467)	(0.0487)	(0.0419)
Mean (Y)	0.769	0.767	0.770	0.767	0.720	0.832
N	22,255	18,210	10,973	11,282	12,613	9,642
Panel B: Graduated from High School						
ShareEligible*YearsExposed	0.0863**	0.0875*	-0.0254	0.175***	0.135**	0.0181
	(0.0433)	(0.0462)	(0.0661)	(0.0616)	(0.0594)	(0.0647)
Mean (Y)	0.578	0.571	0.619	0.538	0.464	0.726
N	22,255	18,210	10,973	11,282	12,613	9,642
Panel C: Semester GPA						
ShareEligible*YearsExposed	0.162*	0.188*	0.162	0.165	0.209**	0.0956
	(0.0914)	(0.102)	(0.107)	(0.117)	(0.100)	(0.137)
Mean (Y)	2.137	2.106	2.295	1.984	1.762	2.626
N	59,215	48,450	29,080	30,135	32,899	26,316
Panel D: Standardized Exam Performance (ELA)						
ShareEligible*YearsExposed	0.228***	0.214***	0.204***	0.259***	0.123	0.313***
	(0.0668)	(0.0719)	(0.0776)	(0.0877)	(0.0839)	(0.0888)
Mean (Y)	-0.127	-0.156	-0.0532	-0.199	-0.635	0.491
N	42,162	34,700	21,140	21,022	21,785	20,377
Controls						
Full Set	X	X	X	X	X	X

Note: This table contains results obtained from regressing indicators for enrollment and high school graduation on $(\text{ShareEligible}_z * \text{YearsExposed}_c)$. The sample for these regressions are foreign-born Hispanic students who were in 9th grade cohorts from 2006-07 to 2013-14 who arrived to the US by age 9. See Table 3 for more detail on the sample and the full set of controls. Standard errors in parentheses are clustered by residence zip-code. *p<0.10, ** p<0.05, *** p<0.01.

Table 6: The Effect of DACA on Predicted High School Completion and Exogenous Student Characteristics, US-Born Students

	Predicted HS Grad	Black	Hispanic	Male	Special Education	ELA (G7)	Math (G7)	ELA (G8)
DACAShare*	-0.109	0.365*	-0.332	-0.127	-0.0229	-0.152	0.339	-0.569
FracExposed	(0.135)	(0.195)	(0.292)	(0.190)	(0.133)	(0.600)	(0.771)	(0.571)
	[-0.00]	[0.01]	[-0.01]	[-0.00]	[-0.00]	[-0.00]	[0.01]	[-0.01]
Mean (Y)	0.599	0.103	0.781	0.510	0.0867	-0.00795	0.0488	-0.0462
N	239,072	239,072	239,072	239,072	239,072	224,890	224,966	239,072
Controls								
Cohort FE	X	X	X	X	X	X	X	X
Campus FE	X	X	X	X	X	X	X	X

Note: This table contains results obtained from regressing predicted high school completion and student demographics on DACAShare$_{sc}$*â*FracExposed$_{c}$. The sample for these regressions are US-born students who were in 9th grade cohorts from 2006-07 to 2013-14. The demographic variables are measured as of 9th grade. See Table 7 for more detail on the sample and the full set of controls. Standard errors in parentheses are clustered at the high school campus level. The effect of DACA for the average high school student with 2 percent DACA-eligible peers are shown in brackets, and is defined as the coefficient multiplied by 0.02. *p<0.10, ** p<0.05, *** p<0.01.

Table 7: The Effect of DACA on Enrollment and High School Graduation, US-Born Students

	(1)	(2)	(3)	(4)
Panel A: Enrolled in 10th Grade				
DACAShare*FracExposed	0.375	0.378	0.392	0.225
	(0.347)	(0.345)	(0.343)	(0.346)
	[0.01]	[0.01]	[0.01]	[0.00]
Mean (Y)	0.907	0.907	0.907	0.907
Panel B: Enrolled in 11th Grade				
DACAShare*FracExposed	0.615*	0.634*	0.679*	0.603
	(0.362)	(0.363)	(0.357)	(0.372)
	[0.01]	[0.01]	[0.01]	[0.01]
Mean(Y)	0.847	0.847	0.847	0.847
Panel C: Enrolled in 12th Grade				
DACAShare*FracExposed	0.941**	0.987**	1.027**	0.961**
	(0.422)	(0.424)	(0.419)	(0.400)
	[0.02]	[0.02]	[0.02]	[0.02]
Mean (Y)	0.771	0.771	0.771	0.771
Panel D: Graduated from High School				
DACAShare*FracExposed	0.990**	1.034**	1.126**	1.026**
	(0.486)	(0.492)	(0.458)	(0.441)
	[0.02]	[0.02]	[0.02]	[0.02]
Mean (Y)	0.575	0.575	0.575	0.575
N	239,072	239,072	239,072	239,072
Controls				
Cohort FE	X	X	X	X
Campus FE	X	X	X	X
Demographics		X	X	X
8th Grade Std Test (ELA)			X	X
Campus-Cohort Demographics				X

Note: This table contains results obtained from regressing the DACA-peer exposure variable on an indicator for being enrolled 1-3 years after 9th grade and a HS graduation indicator. The sample for these regressions are US-born students who were in 9th grade cohorts from 2006-07 to 2013-14. Individual controls include gender, race, disability status and gender-race interactions. District demographic cohort controls include the percentage of students belonging to each racial group, enrolled in special education, and who are male. Standard errors in parentheses are clustered at the high school campus level. The effect of DACA for the average high school student with 2 percent DACA-eligible peers are shown in brackets, and is defined as the coefficient multiplied by .02. *p<0.10, ** p<0.05, *** p<0.01.

Table 8: The Effect of DACA on Yearly Outcomes, US-Born Students

	(1)	(2)	(3)	(4)
Panel A: Yearly Attendance Rate				
DACAShare*FracExposed	-0.0337	-0.0399	-0.0298	-0.0600
	(0.0828)	(0.0829)	(0.0795)	(0.0845)
	[-0.00]	[-0.00]	[-0.00]	[-0.00]
Mean (Y)	0.928	0.928	0.928	0.928
N	622,205	622,205	622,205	622,205
Panel B: Ever Disciplined				
DACAShare*FracExposed	0.0453	0.0468	0.0384	0.0189
	(0.168)	(0.165)	(0.162)	(0.169)
	[0.00]	[0.00]	[0.00]	[0.00]
Mean (Y)	0.0478	0.0478	0.0478	0.0478
N	655,995	655,995	655,995	655,995
Panel C: Semester GPA				
DACAShare*FracExposed	1.399*	1.271*	1.562**	1.408**
	(0.778)	(0.686)	(0.675)	(0.708)
	[0.03]	[0.03]	[0.03]	[0.03]
Mean (Y)	2.201	2.201	2.201	2.201
N	631,246	631,246	631,246	631,246
Panel D: Missing Standardized Exam Performance (ELA)				
DACAShare*FracExposed	-0.0675	-0.0560	-0.132	-0.0362
	(0.258)	(0.254)	(0.252)	(0.248)
	[-0.00]	[-0.00]	[-0.00]	[-0.00]
Mean (Y)	0.160	0.160	0.160	0.160
N	516,925	516,925	516,925	516,925
Panel E: Standardized Exam Performance (ELA))				
DACAShare*FracExposed	2.710***	2.676***	3.324***	3.358***
	(0.916)	(0.824)	(0.638)	(0.662)
	[0.05]	[0.05]	[0.07]	[0.07]
Mean (Y)	0.0202	0.0202	0.0202	0.0202
N	457,686	457,686	457,686	457,686
Controls				
Cohort FE	X	X	X	X
Campus FE	X	X	X	X
Demographics		X	X	X
8th Grade Std Test (ELA)			X	X
Campus-Cohort Demographics				X

Note: This table contains results obtained from regressing the DACA-peer exposure variable on yearly outcomes between 9th and 11th grade. The sample for these regressions are US-born students who were in 9th grade cohorts from 2006-07 to 2013-14. See Table 7 for more detail on the sample and the full set of controls. Standard errors in parentheses are clustered at the high school campus level. Standard errors in parentheses are clustered at the high school campus level. The effect of DACA for the average high school student with 2 percent DACA-eligible peers are shown in brackets, and is defined as the coefficient multiplied by .02. *p<0.10, ** p<0.05, *** p<0.01.

Table 9: The Heterogenous Effects of DACA on School Attendance and High School Completion, US-born students

							8th Grade ELA Test Score Quartiles			
	Full	Black	Hispanic	White	Female	Male	($\leq$ 25)	(25 - 50)	(50 - 75)	$\geq$ 75
Panel A: Enrolled in 12th Grade										
DACAShare*FracExposed	1.027**	2.547***	0.783*	1.346	0.801*	1.231***	1.957***	0.901**	0.627	0.665
	(0.419)	(0.788)	(0.427)	(1.835)	(0.465)	(0.450)	(0.636)	(0.449)	(0.415)	(0.510)
	[0.02]	[0.05]	[0.02]	[0.03]	[0.02]	[0.02]	[0.04]	[0.02]	[0.01]	[0.01]
Mean (Y)	0.771	0.646	0.787	0.720	0.777	0.765	0.673	0.763	0.809	0.841
Panel B: Graduated from High School										
DACAShare*FracExposed	1.126**	1.955**	0.625	1.098	1.146**	1.098**	1.472**	1.313***	0.560	0.802
	(0.458)	(0.855)	(0.458)	(1.794)	(0.488)	(0.472)	(0.610)	(0.486)	(0.543)	(0.577)
	[0.02]	[0.04]	[0.01]	[0.02]	[0.02]	[0.02]	[0.03]	[0.03]	[0.01]	[0.02]
Mean (Y)	0.575	0.442	0.578	0.616	0.621	0.531	0.340	0.535	0.665	0.763
N	239,072	24,723	186,748	15,327	117,218	121,854	60,514	58,590	61,101	58,867
Panel C: Semester GPA										
DACAShare*FracExposed	1.562**	2.258**	1.268*	-3.322	1.879**	1.252*	2.208**	2.311***	1.447*	1.551*
	(0.675)	(1.030)	(0.739)	(2.659)	(0.770)	(0.721)	(0.894)	(0.774)	(0.844)	(0.833)
	[0.03]	[0.05]	[0.03]	[-0.07]	[0.04]	[0.03]	[0.04]	[0.05]	[0.03]	[0.03]
Mean (Y)	2.201	1.976	2.139	2.683	2.361	2.047	1.501	1.937	2.374	3.002
N	631,246	59,113	500,301	38,581	309,418	321,828	153,158	154,736	164,162	159,190
Panel D: Standardized ELA Performance										
DACAShare*FracExposed	3.324***	1.353	2.970***	-1.370	3.474***	3.151***	1.656**	3.869***	3.123***	3.706***
	(0.638)	(1.524)	(0.637)	(1.928)	(0.577)	(0.773)	(0.723)	(0.832)	(0.798)	(0.690)
	[0.07]	[0.03]	[0.06]	[-0.03]	[0.07]	[0.06]	[0.03]	[0.08]	[0.06]	[0.07]
Mean (Y)	0.0202	-0.198	-0.0573	0.701	0.119	-0.0756	-0.911	-0.377	0.193	1.065
N	457,686	40,651	361,339	29,193	229,275	228,411	93,970	109,475	125,557	128,684

Note: This table contains results obtained from regressing indicators for 12th grade enrollment, high school graduation, and ELA standardized test performance on ($\text{DACAShare}_{sc} * \text{FracExposed}_{c}$). The sample for these regressions are US-born students who were in 9th grade cohorts from 2006-07 to 2013-14. See Table 7 for more detail on the sample and the full set of controls. Standard errors in parentheses are clustered at the high school campus level. Standard errors in parentheses are clustered at the high school campus level. The effect of DACA for the average high school student with 2 percent DACA-eligible peers are shown in brackets, and is defined as the coefficient multiplied by .02. *p<0.10, ** p<0.05, *** p<0.01.

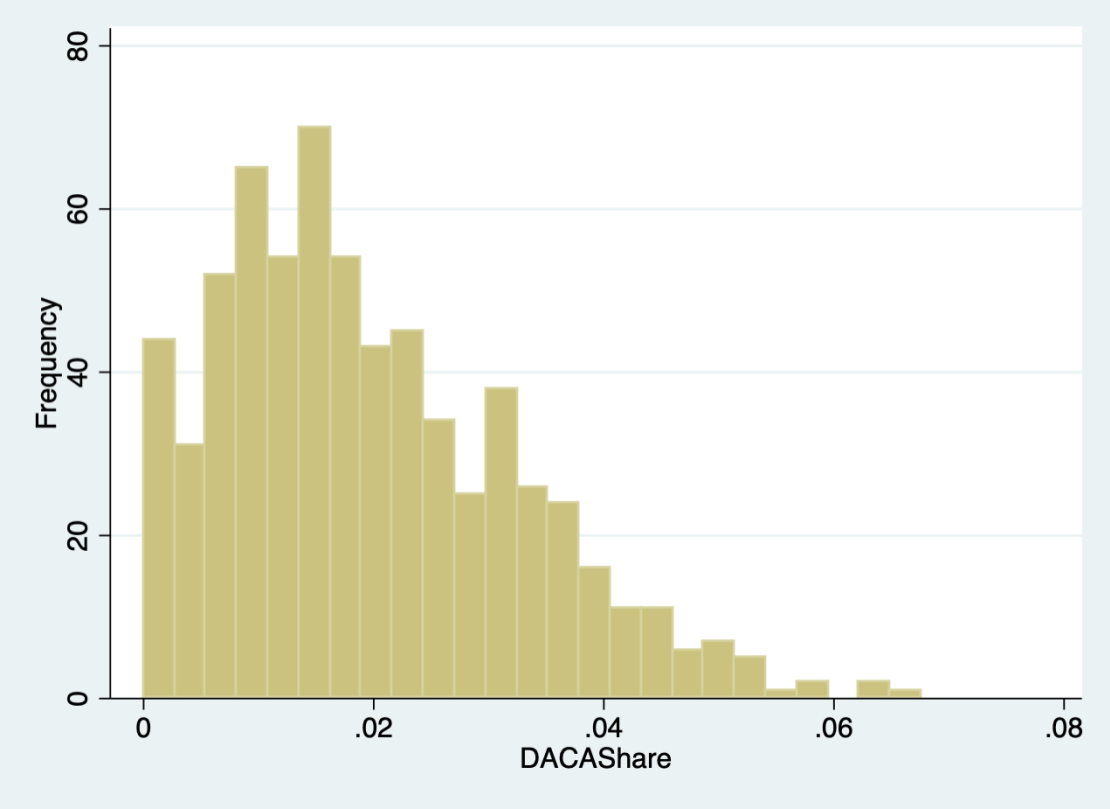
Table 10: The Effect of DACA on Educational Investments of US-Born Students – Robustness of Results to Scaling of Foreign-Born Peer Measure

	DACA Apps	PUMA (MPI)	Non-Citizens	None
	(1)	(2)	(3)	(4)
Panel A: Enrolled in 12th Grade				
DACAShare*FracExposed	1.027**	0.661***	0.381*	0.323
	(0.419)	(0.238)	(0.225)	(0.199)
	[0.02]	[0.01]	[0.01]	[0.01]
Mean (Y)	0.771	0.771	0.771	0.771
Panel B: Graduated from High School				
DACAShare*FracExposed	1.126**	0.597**	0.468*	0.441*
	(0.458)	(0.265)	(0.247)	(0.224)
	[0.02]	[0.01]	[0.01]	[0.01]
Mean (Y)	0.575	0.575	0.575	0.575
N	239,072	239,072	239,072	239,072
Panel C: Standardized Exam Performance (ELA))				
DACAShare*FracExposed	3.324***	1.669***	1.208***	1.066***
	(0.638)	(0.372)	(0.336)	(0.302)
	[0.07]	[0.03]	[0.02]	[0.02]
Mean (Y)	.0202	0.0202	0.0202	0.0202
N	457,686	457,686	457,686	457,686
Controls				
Cohort FE	X	X	X	X
Campus FE	X	X	X	X

Note: This table contains estimates where the fraction of foreign-born peers is scaled by different measures. The full set of controls and information on the sample is specified in Table 7. Standard errors in parentheses are clustered at the high school campus level. The effect of DACA for the average high school student with 2 percent DACA-eligible peers are shown in brackets, and is defined as the coefficient multiplied by .02. *p<0.10, ** p<0.05, *** p<0.01.

A Appendix

Figure A.1: Histogram of DACA-eligible Concentration in 9th grade cohorts from 2007-2014



Note: DACA-eligible concentration is calculated as the number of Hispanic foreign-born youth who arrived to the US by age 9 estimated to be DACA-eligible, divided by the total number students in each school and 9th grade cohort. The total number of campus-cohorts is reported as the frequency.

Table A.1: 9th Grade Cohorts and Share Exposed to DACA During HS

9th Grade Cohort	Policy Exposure by Year-Grade			FracExposed_c
	10	11	12	
2006-07	2007-08	2008-09	2009-10	0
2007-08	2008-09	2009-10	2010-11	0
2008-09	2009-10	2010-11	2011-12	0
2009-10	2010-11	2011-12	2012-13	0.25
2010-11	2011-12	2012-13	2013-14	0.50
2011-12	2012-13	2013-14	2014-15	0.75
2012-13	2013-14	2014-15	2015-16	1
2013-14	2014-15	2015-16	2016-17	1

Note: This table shows the cross-cohort variation in policy exposure by 9th grade cohort. The first school year after DACA's enactment was the 2012-2013 school year. 9th grade cohorts differed in the amount of time during high school that they were expected to be enrolled in school after DACA's enactment. For each 9th grade cohort, this table highlights each year-grade of expected exposure to DACA during high school.

Table A.2: Summary Statistics - 9th Grade Cohorts Between 2007 - 2014

	US-Born	Foreign-Born Hispanic	Foreign-Born Hispanic (By Age at Arrival)	
			(≤ 9)	(> 9)
	(1)	(2)	(3)	(4)
Demographics (G9)				
Hispanic	0.75	1.00	1.00	1.00
Black	0.10	-	-	-
White	0.07	-	-	-
Asian	0.04	-	-	-
English Learner	0.15	0.37	0.27	0.62
Free-Lunch	0.65	0.67	0.67	0.66
Male	0.51	0.51	0.51	0.53
Baseline Achievement				
Std ELA Score (G8)	-0.03	-0.38	-0.22	-0.74
Std ELA Score (G7)	0.01	-0.36	-0.19	-0.81
Std Math Score (G7)	0.08	-0.18	-0.08	-0.46
Outcomes				
Ever Disciplined	0.06	0.06	0.06	0.06
GPA (S)	2.25	2.16	2.14	2.11
Std ELA Score (G11)	-0.01	-0.25	-0.15	-0.51
Graduated HS	0.58	0.55	0.58	0.47
Total Students	239,072	32,409	22,255	10,154

Note: This table presents summary statistics for US born and Hispanic foreign-born students in 9th grade cohorts between 2007 and 2014. The foreign-born sample is also split by the age of arrival to the US.

Table A.3: The Effect of DACA on High School Graduation of US-Born Students – Accounting for Differences in the Fraction of Students able to Pass the High School Exit Exam on their First Attempt in 2013

	(1)	(2)	(3)	(4)
Likelihood of Graduating from High School				
Treatment	0.823***	0.845***	0.867***	0.707**
	(0.280)	(0.277)	(0.281)	(0.276)
	[0.02]	[0.03]	[0.03]	[0.02]
Mean (Y)	0.573	0.573	0.573	0.573
Controls				
Full Set	X	X	X	X
$f(t)\times$ Fraction Passed Math Exit		X		X
$f(t)\times$ Fraction Passed ELA Exit			X	X

Notes: This table contains estimates of DACA-eligible peers on the likelihood of high school completion. These models use the full set of controls specified in Table 7 and also linear time trends that vary by the fraction of 10th graders who passed the high school exit exam in 2013 (the year DACA was enacted). See Table 7 for the full list of controls and more information about the specifications that were run. Standard errors in parentheses are clustered at the campus level. The effect of DACA for the average high school student with 2 percent DACA-eligible peers are shown in brackets, and is defined as the coefficient multiplied by .02. *p< 0.10, **p < 0.05, *** p< 0.01.

Table A.4: The Effect of DACA on Yearly Outcomes – Individual Student Fixed Effect Model, US-born Students

	Attendance Rate	Ever Disciplined	Semester GPA	Std ELA
Treatment	-0.0236	0.0857**	-1.231***	1.740***
	(0.0277)	(0.0429)	(0.368)	(0.600)
	[-0.00]	[0.00]	[-0.04]	[0.05]
Mean (Y)	0.947	0.0328	2.449	0.115
N	644,380	663,492	645,935	444,023

Note: This table contains results obtained from an individual fixed effects model (Equation 10) where I regress the DACA-peer exposure variable on yearly attendance rates, a yearly indicator for whether students were disciplined, yearly Fall GPA, and yearly performance on the English standardized exam. See Table 7 for the full list of controls and information about the sample. Standard errors in parentheses are clustered at the high school campus level. I limit this yearly analysis to the three years after 9th grade. The effect of DACA for the average high school student with 2 percent DACA-eligible peers are shown in brackets, and is defined as the coefficient multiplied by .02. *p<0.10, ** p<0.05, *** p<0.01