Heterogeneous Effects of Deferred Action for Childhood Arrivals (DACA) on Undocumented College Students' Educational Outcomes

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Abstract

Deferred Action for Childhood Arrivals (DACA) is a U.S. immigration program enacted in August 2012, offering eligible undocumented youth relief from deportation and renewable work permits. Drawing on unique administrative dataset on the population of undocumented students attending the City University of New York (CUNY), we utilize difference-in-difference regressions to examine the effects of DACA on college GPA and dropout rates. We find that DACA's effects on educational outcomes are heterogeneous: It has a negative effect on undocumented students who, prior to the policy, were academically high performing and taking on a heavy course-load, while it had no significant impact on low academic performers and those maintaining a light course-load. We speculate that high achievers were less likely to be working prior to DACA, and the newfound employment opportunities incentivized them to find work and consequently lowered their educational outcomes. Conversely, the new job opportunities did not alter the work commitments of low achievers because they were more likely to be already working and thus had no significant impact on their educational outcomes. Our findings help reconcile conflicting results of previous studies. More broadly, our results suggest that DACA does not encourage undocumented youth to fully invest in their education because of the political uncertainty over the program's future and significant financial barriers to higher education.

Introduction

An estimated 3.6 million undocumented immigrants in the United States arrived to the country before their eighteenth birthday (Migration Policy Institute 2017). For decades, legislative efforts to offer pathways to legal residency for these undocumented youths have failed. In response to the sustained activism of undocumented youth and congressional inaction, President Obama introduced the Deferred Action for Childhood Arrivals (DACA) in the summer of 2012. DACA offers two-year renewable work permits to eligible undocumented youth and temporary reprieve from deportation. As of 2017, roughly 800,000 undocumented youth were granted approval of DACA of the estimated 1.3 million immediately eligible population (Capps, Fix, and Zong 2017).

The literature to date suggests that DACA has improved the lives of recipients and their families in many ways. It has increased their labor market participation and pulled many households out of poverty (Ortega, Edwards and Hsin 2018; Amuedo-Dorantes and Antman 2017; Gonzales et al. 2016; Pope 2016). It has also reduced the social stigma associated with lacking legal status and improved the mental health of undocumented immigrants and their families (Abrego 2018; Hainmueller et al. 2017; Patler and Pirtle 2017; Vaquera, Aranda, and Sousa-Rodriguez 2017). However, the effects on DACA on educational outcomes remain unclear. We do not know, for instance, whether removing legal barriers to employment encourages undocumented youth to increase their educational investments in anticipation of greater future returns or instead incentivizes them to prioritize immediate labor market gains.

Empirical examinations of the effects of DACA on educational outcomes yield mixed findings. On the one hand, by setting high school graduation as a criterion for eligibility, DACA

may have increased high school graduation rates (Kuka, et al. 2018).[1] Some studies further find that DACA motivated youth to pursue professional goals and enabled them to finance postsecondary education by allowing them to work legally (Abrego 2018; Gonzales et al. 2016; Kuka, et al. 2018; Wong et al. 2016). Other studies, however, find that DACA increases labor force participation of youth and that this increase comes at the expense of college attainment (Hsin and Ortega 2018; Amuendo-Dorantes and Antman 2017; Pope 2016).

Our study investigates the possibility that previous research finds mixed effects of DACA because the policy affects different types of students differently. We speculate that DACA has a stronger negative effect on the educational outcomes of high performing students than low performing students because those earning higher grades and taking more courses prior to DACA were less likely to be working or working fewer hours. The newfound work opportunities associated with DACA may consequently channel their attention away from schooling and towards employment. In contrast, those who were academically low performing before DACA were more likely to have been devoting large amounts of time to working, and thus new employment opportunities may have negligible effects on their school performance. For these students, work authorization may even improve their academic performance insofar as they are now able to find jobs that pay more, offer greater flexibility and better work conditions (Hsin and Ortega 2018). Failing to account for how DACA differentially affect students may explain why prior studies find contradictory results.

[1] Individuals are eligible to apply for DACA if they meet the following seven criteria: 1) under the age of 31 as of June 15, 2012; 2) came to the U.S. under the age of 16; 3) have continuously resided in the U.S. between June 15, 2007 to the present; 4) had no lawful status on June 15, 2012; 5) were physically present in the U.S. on June 15, 2012, and at the time of making the request for consideration of deferred action with USCIS; 6) are currently in school, have graduated from high school, have obtained a GED, or honorably discharged from the Coast Guard or armed forces; 7) have not been convicted of a felony, a significant misdemeanor, or more than three misdemeanors of any kind, and do not pose a threat to national security or public safety (USCIS 2018).

We investigate these questions using unique administrative data on the population of undocumented students attending the City University of New York (CUNY). We use difference-in-difference regressions to examine the effects of DACA on college GPA and dropout rates of undocumented youth. The results support our hypothesis that DACA has heterogeneous effects on students. We find that DACA has the largest negative effects on the educational outcomes of undocumented students who, prior to the policy's implementation, were the most academically engaged (i.e., with a high GPA and taking a heavy course-load), while it has no significant effect on students who were the least academically engaged (i.e., with a low GPA and taking a light course-load). Such heterogeneous effects may help reconcile conflicting results from previous studies. More broadly, our findings suggest that DACA discourages undocumented youth from fully investing in their education. Notably, DACA appears to incentivize previously high performing, academically committed college students to prioritize immediate labor market returns over their schooling.

Background and Prior Research

Undocumented Students in Higher Education

The challenges undocumented students face in pursuing higher education are in some ways shared by legal residents from low socioeconomic backgrounds (Abrego 2006). For instance, much like working class, first generation students with U.S. citizenship, undocumented students typically struggle to gain access to postsecondary education due to insufficient academic preparation, lack of "college knowledge," and limited social capital (Garcia and Tierney 2011). Moreover, undocumented students face significant pressure to contribute to household finances because 70 percent of families headed by undocumented parents subsist at or near the poverty

line (Amuendo-Dorantes and Antman 2017; Gonzales et al. 2014). As a result, undocumented students, much like socioeconomically disadvantaged citizen or first generation college students, often have to prioritize employment over academic work, even as they work to pay for college (Abrego 2006; Enriquez 2017).

However, undocumented students also face unique barriers to college enrollment, performance, and graduation due to their immigration status. First, undocumented immigrants' educational motivations and aspirations can be depressed because their lack of legal status discourages them from setting high occupational goals (Abrego 2006; Diaz-Strong and Meiners 2007; Ortega and Hsin 2018). Uncertain about their future returns to postsecondary education, many undocumented students prioritize immediate labor market earnings over investments in further schooling (Greenman and Hall 2013). Second, even when undocumented immigrants persist in maintaining ambitious educational aspirations, they face numerous structural hurdles in college enrollment (Abrego and Gonzales 2010; Patler 2017). Although the Supreme Court ruling in *Plyler v. Doe* (1982) granted undocumented students a constitutional right to a K-12 education, there are no federal guidelines regarding their educational rights after graduating from high school. Currently, undocumented students are ineligible for federal college financial aid (e.g., Pell Grants) and they cannot participate in federally funded work-study programs. As a result, many undocumented students cannot afford to pay for college tuition. In part because of these challenges, only 20 percent of undocumented youth who graduated from U.S. high schools– roughly 250,000 – are currently enrolled in post-secondary schooling (Ortega et al. 2017). In contrast, about 70 percent of all high school graduates in the U.S. were enrolled in colleges or universities in the past year (Bureau of Labor Statistics 2017).

State-level policies regarding college tuition and financial aid also have a significant

impact on the postsecondary educational attainment of undocumented youth (Abrego 2006; Conger and Chellman 2014; Rincon 2008). Currently, twenty-one states permit resident undocumented students to pay in-state tuition rates to enroll in public colleges, which reduces the cost of attendance by as much as two-thirds (NASPA 2017). Ten states, including California and most recently New Jersey, have gone a step further to offer undocumented students access to state financial aid (Alvarado 2018). In contrast, at least three states have imposed restrictive policies that severely limit undocumented youth's access to higher education (Hooker, McHugh, and Mathay 2015). In Georgia, for example, undocumented students are banned from attending the state's top five public colleges, and they are required to pay out-of-state tuition for all other state public institutions. New York, the state which we focus on in this paper, has allowed undocumented residents to pay in-state tuition rates to attend its public colleges since 2001 (although Republican lawmakers have attempted to repeal this policy over the years), but legislative efforts to offer state financial aid have not succeeded as of 2018.

The implementation of DACA in 2012 and the temporary work permits it provided did not directly tackle the challenges undocumented students face in pursuing higher education. However, it did affect their educational opportunities more broadly. For instance, the introduction of DACA encouraged some states to expand educational opportunities by allowing undocumented students to pay in-state tuition to attend college (Cebulko and Silver 2016). Moreover, their access to legal employment under DACA may have helped undocumented youth pay for college with their new earnings. The possibility of expanded employment opportunities for college educated DACA recipients – including in professions such as teaching – may have encouraged some students to pursue degree completion. The precise effects of DACA on the educational outcomes of undocumented college students, however, remain theoretically unclear,

and existing research provides mixed evidence.

Effects of DACA on Educational Outcomes

Does removing legal barriers to employment increase or decrease undocumented youth's educational investments? Likewise, how might a temporary work permit program like DACA incentivize or disincentive work-schooling decisions? The existing literature suggests that two competing hypotheses – that providing legal work opportunities positively *or* negatively affect undocumented students' educational outcomes – are both theoretically plausible. On the one hand, DACA may positively affect college attainment outcomes by increasing the returns to education. The allure of legal work opportunities may motivate many undocumented youth to invest more time and attention into school so that they can graduate and pursue their career goals in anticipation of increased future returns (Abrego 2018; Gonzales et al. 2016; Kuka et al. 2018). On the other hand, the implementation of DACA may create significant downward pressure on academic outcomes. Specifically, DACA may encourage undocumented students to obtain legal employment while maintaining college enrollment because the attraction – or necessity – of immediate labor market returns may outweigh the expectation of greater returns to educational investment in the future (Amuendo-Dorantes and Antman 2017; DeSimone 2008; Hsin and Ortega 2018). Moreover, the temporary nature of DACA and the political uncertainty over the program's future may have significant ramifications for how undocumented students respond to DACA. Notably, the Trump administration's rescinding of DACA in 2017 and the subsequent lawsuits that extended the opportunity to renew the status for those who already had it may have encouraged undocumented youth to prioritize their newfound access to legal employment over further investments in their education while they still have access to the former.

Empirical evaluations of these theories offer a similarly mixed and complicated picture. However, on the high school level, both qualitative and quantitative studies consistently show that DACA positively influences high school graduation rates of undocumented youth (Abrego 2018; Gonzales et al. 2016; Kuka et al. 2018). A recurrent theme in interview-based studies of DACA recipients is that the program increased their motivation to graduate from high school (Abrego 2018; Gonzales et al. 2016). This finding is supported by a recent quantitative study analyzing nationally representative data that showed that DACA increased the high school graduation rates of undocumented youth by about 15 percentage points (Kuka et al. 2018). Since obtaining a high school diploma (or GED) is an eligibility requirement of DACA, it is not surprising that DACA might incentivize high school graduation.

How DACA affects undocumented youth's postsecondary schooling outcomes is more complicated. In a recent study, Kuka et al. (2018) estimate the effect of DACA on college enrollment using the American Community Survey and non-citizenship status and country of origin as proxies for legal status. Estimating difference-in-difference regressions, they find that DACA has large positive effects on the college enrollment of Hispanic females and smaller but still positive effects on the enrollment of Hispanic males. Kuka et al. (2018) also find that students who acquired more schooling worked more under DACA, suggesting that some undocumented youth were able to take advantage of legal work options to finance schooling. These findings parallel results from Wong and colleagues' (2016) non-representative internet surveys of DACA recipients which found that the policy allowed nearly all respondents to pursue educational opportunities that they previously could not. Moreover, several qualitative studies have made similar claims. For instance, through interviews with undocumented students, Abrego (2018) reported that DACA motivated undocumented students to attend college, while Gonzales

et al. (2016) similarly observed that the opportunities that DACA afforded respondents resulted in "renewed hope, more concrete goals, and better performance at school and at work" (2). Overall, these studies suggest that DACA may increase educational outcomes through two mechanisms: 1) increasing the returns to education and 2) allowing students to legally work to fund schooling.

In contrast, other studies suggest more neutral or negative effects of DACA on college attainment. Pope (2016) used the American Community Survey to infer legal status and estimated difference-in-difference regressions. He found that DACA increased the labor force participation of college-aged youth who were likely undocumented and had little effect on college enrollment. Using similar methods but applied to analysis of the Current Population Survey, Amuendo-Dorantes and Antman (2017) found that DACA increased labor force participation but reduced college enrollment of high school graduates who were likely undocumented. Hsin and Ortega (2018) analyzed administrative data on the population of undocumented students attending a large urban university system. In contrast to previous studies, they could accurately identify legal status of students and differentiate between students attending community versus 4-year colleges. They found the effects of DACA varied by institution type: at four-year colleges, DACA increased dropout rates of undocumented students at four-year college, while at community colleges DACA reduced the share of students attending school on a full-time basis but had no effect on dropout rates. They concluded that DACA incentivized work over schooling for many undocumented students but that the effects of DACA on dropout rates depend on how easily schools accommodate working students. Together, these studies offer evidence that new legal work opportunities incentivize some students to forgo schooling to work.

Incentivizing working while enrolled in college may lead to lower educational outcomes insofar as it is challenging to maintain a healthy school-work balance. For instance, working while schooling is likely to lead to lower GPA (Trockel et al. 2000). A study of full-time four-year college students found that, each additional weekly work hour reduced the academic performance of students by 0.011 points (DeSimone 2008). For example, a student who works a 30 hour-work week saw their average grade decline from A- to B+ compared to those not participating in the labor market. As such, we would expect DACA to lead to lower educational outcomes if it incentivizes college students to find work or increase their work hours.

Inconsistent findings in the literature regarding DACA's effects undocumented youth's postsecondary educational outcomes may be partly attributed to methodological constraints. Most notably, the U.S. census and most national surveys do not contain information on immigrants' legal status. As a result, most previous studies have relied on imputations of undocumented status, which can lead to large bias in some applications, or turned to non-representative online surveys that suffer from methodological issues with respondent self-selection (Van Hook et al. 2015; Wong et al. 2015).

Heterogeneous Effects of DACA

Another possible explanation for these inconsistent findings is that DACA affects different types of students differently. Although few studies focusing on undocumented students have explored this possibility, a study of nationally representative college students found that the effect of increasing work hours was heterogeneous, and that it negatively affected the course completion of full-time but not part-time students (Darolia 2014). In a similar vein, we speculate that DACA may have heterogeneous effects on the educational outcomes of undocumented college students

contingent on their prior work commitments. Undocumented students who were already working (without employment authorization) before DACA may experience little change in their educational outcomes such as their academic performance or likelihood of dropping out because they were already employed. In fact, DACA may even increase their academic outcomes because newfound legal work options will mean undocumented students can find better employment: Jobs they can earn more money to pay for schooling (Greenman and Hall 2013; Ortega et al. 2018); jobs that are commensurate with their skills and professional aspirations (Ortega and Hsin, 2018); jobs that expose them to less exploitation (Greenman and Hall 2013; Gleeson and Gonzales 2012). For these students, work authorization allows them to better balance work and school, which may, in turn, positively affect academic outcomes.

In contrast, among nonworking students or students who work relatively few hours, DACA may have negative effects. Those who were unemployed prior to DACA may have avoided seeking jobs to avoid the risks of unlawful employment that may increase their risk of deportation or exploitative labor practices. For these students, the introduction of DACA and its legal work opportunities likely make employment a tempting option in lieu of or in addition to their schooling. In such a scenario, these students may have more to "lose" in terms of their educational outcomes if legal work options divert attention away from schooling and towards new work opportunities.

Although the dataset our paper draws on does not contain information regarding students' employment status, we can infer employment status from their pre-DACA course-loads. We assume that most undocumented students who were taking a heavy course-load prior to DACA were less likely to be employed, while those who were taking a light course-load before DACA were more likely to be employed. We therefore contend that if the effects of DACA on academic

outcomes are heterogeneous, they will have a significant negative effect on the academic performance and retention rates of undocumented college students who were academically high performers and those with a heavy course-load (i.e., those who were not likely to be working), while it will have a negligible or even positive impact on the educational outcomes of low academic performers and those with a light course-load (i.e., those who were likely to be already working).

Research Questions

Differential effects might account for why some prior studies have found positive effects while others have found negative effects of DACA on college outcomes. To date, studies have not considered heterogeneous effects of DACA. A notable exception is Hsin and Ortega (2018) who examine variation in the effect of DACA on dropout rates by community versus 4-year colleges. Building off of their data and methodological framework, we investigate the effect of DACA on undocumented college students' academic performance and dropout rates and explicitly considering differential effects by two indicators of academic engagement—students who are low versus high performers and light versus heavily course-takers.

We ask the following research questions:

(1) How does DACA affect the dropout rates of undocumented college students? How does this effect vary by pre-DACA academic performance and courseload?

(2) How does DACA affect the academic performance (GPA) of undocumented college students? How does this effect vary by pre-DACA academic performance and courseload?

Data and Methods

Data

This paper draws on unique administrative data from the City University of New York (CUNY), the largest urban university system in the United States. CUNY educates over 270,000 students across 18 undergraduate campuses, of which 7 are community colleges. In this paper, we focus on the cohort who entered college from Spring 2010 to Fall 2012 and we follow them until Fall 2014. We restrict our analytical sample to the subset of students who were enrolled in college before and after the passage of DACA. We restrict the sample to avoid potential bias that may be introduced if DACA motivated different types of students to enroll in college (Kuka et al. 2018). If this is the case, cohorts that enter post-DACA would be systematically different from those we enter pre-DACA. We restrict the sample to eliminate this potential source of bias. Our analytical sample is comprised of 67,966 students attending community colleges and 55,783 students attending 4-year colleges.

Measures

Our outcome variables of interest are dropout and college GPA. We use a dummy variable to measure dropout, utilizing dropout = 1 if a student who was previously enrolled is no longer enrolled in a given semester. College GPA is a continuous variable that measures the grade point average earned in each semester. We standardize GPA by subtracting the mean and dividing by the standard deviation.

The main explanatory variable is the student's immigration and legal status. Students are asked to self-report as U.S. citizens, legal permanent residents, or undocumented immigrants when they first enroll in school. Students must submit documentation to validate these self-

reports. There are large financial incentives for undocumented students to self-identify accurately. CUNY offers in-state tuition to undocumented students who graduated from a high school or obtained a GED from within the state. In order to qualify for in-state tuition, undocumented students must provide a notarized affidavit stating that they will pursue steps to obtain legal residency if such options become available. Out-of-state tuition for a full-time student at 4-year colleges in 2016 is about $17,000 versus $6,500 for in-of-state tuition; $9,600 per year for out-of-state residents at community colleges; $4,800 per year for New York State residents.

Legal status is measured as a dummy variable indicating whether the student is undocumented. Individuals who obtained their high school degree outside of the United States and self-report as undocumented and individuals who obtained their high school degree in the United States but outside of the state are excluded from the analytical sample. This step was taken to eliminate foreign students or out-of-state, documented students who might self-report undocumented status to gain in-state tuition.

We stratify our analysis by three key variables. First, we separately analyze students who are enrolled in community colleges versus students who are enrolled in 4-year, bachelor degree granting colleges. We stratify by college type because these types of institutions fundamentally differ in how they accommodate working students and previous studies have shown that institution type matters in determining the academic performance of undocumented students (as well as all low-income students) (Hsin and Ortega 2018; Hsin and Reed 2018). Second, we stratify our analysis by low versus high performers. Low-performers are students whose pre-DACA cumulative GPA is below the sample mean at their respective institutions. High performers are students whose pre-DACA cumulative GPA is above the sample mean at their

respective institutions. Third, we stratify our analysis by course-load. Light course-load takers are students who in the pre-DACA semesters completed course credits below the sample mean in their respective institutions. Heavy course-load takers are students who in the pre-DACA semesters completed course-credits above the sample mean in their respective institutions.

Analytical Strategy

We adopt the following analytical strategy. First, we estimate the effect of DACA on college dropout and college grade-point-average using difference-in-differences regressions. Our empirical strategy follows Hsin and Ortega (2018) and exploits changes in the outcome variables for undocumented students before and after DACA, relative to changes for students who are legal residents (i.e., legal permanent residents and citizens) over the same time period. Netting out the changes in outcomes for students with legal residence allows us to purge the effects of factors that cannot be observed but affected all students similarly, such as changes in local economic conditions. In the next step, we investigate heterogeneous effects of DACA on college dropout and performance. To do this, we stratify our analysis by low versus high performers and by light versus heavier course-takers.

We estimate the following difference-in-difference estimation:

$$Y_{ict} = \alpha_i + \alpha_c + \alpha_t + \beta Post_t * Undoc_i + \varepsilon_{ict} . \quad (1)$$

In equation (1), Y_{ict} is the outcome variable in semester *t* for student *i* in cohort *c*. The specification includes individual fixed-effects, denoted by α_i, that absorb all time-invariant characteristics of individuals (such as ability, motivation, race/ethnicity and family background).

Our specification also includes fixed-effect for semester year (α_t) and cohort (α_c). The former account for time-varying aggregate effects, such as local labor market conditions, and the latter set of fixed-effects account for the differences in dropout rates (and full-time status) as a student progresses toward graduation. Dummy variable $Undoc_i$ indicates whether student *i* reported being undocumented, and $Post_t$ is an indicator variable marking the roll out of DACA. Lastly, disturbance term ε_{ict}, captures all idiosyncratic variation in the outcome variable that is not picked up by regressors. We restrict the sample to only students who are currently enrolled.

The parameter β, the coefficient on the interaction term between $Post_t$ and $Undoc_i$, is the key parameter of interest. This coefficient is identified by the changes in the outcome variable for undocumented students before and after DACA, net of changes for documented students in the same time period. Besides the difference-in-difference estimation just described, we will also estimate a more flexible specification that allows for time-varying gaps in outcomes between documented and undocumented students. The results of this specification will be useful to assess the validity of the identification assumption of *common trends* required to provide a causal interpretation of our estimates.

One important caveat is that we cannot determine DACA eligibility perfectly. One of the main criteria of eligibility is that undocumented immigrants need a high-school degree (or a GED, or having been honorably discharged from the Armed Forces) to have arrived to the United States before age 16, continuous residence in the United States since 2007, and a clean criminal record. While all students in our sample have fulfilled the first requirement, we cannot know if they fulfill the other requirements. While it is likely that most undocumented students in our data are DACA eligible, our estimates of β should be interpreted as *intent-to-treat* effects. It is likely that average treatment effects (on the treated) are substantially larger because not all

eligible individuals have applied for DACA. As of March 31, 2014, nearly 50 percent of eligible youth who reside in New York applied for DACA (Batalova et al. 2014), and nearly 95 percent of those who applied were approved (USCIS). This compliance ratio implies that the *average treatment* effect (on the treated) will be about twice as large as the *intent-to-treat* effect.

Difference-in-difference estimates provide our main analytical results. In addition, we also estimate a flexible specification that allows for time-varying gaps in outcomes between documented and undocumented students:

$$Y_{ict} = \alpha_i + \alpha_c + \alpha_t + \beta_t Undoc_i + \varepsilon_{ict} \quad (2)$$

The dependent variable Y_{ict} will represent a dummy variable for dropout and grade point average in semester *t* for individual *i* in cohort *c*. Terms α_i , α_c , and α_t are fixed-effects for individuals, years since enrollment, and semester, respectively. β_t captures the difference in the dependent variable between undocumented students and their legal status counterparts for every semester *t*. Regressions for full-time attendance are restricted to the subset of students who are enrolled at each point in time. We plot the estimated β_t to assess parallel trends in the pre-DACA period.

Timing of DACA Implementation

Figure 1 plots the number of approved DACA applications over time. The program was announced in June 2012 and the first applications were accepted in August 2012. The figure shows that very few applications were approved in September or October. However, approvals climbed significantly between October and December of 2012. The figure indicates that the vast

majority of DACA approvals occurred after December 2012. Thus, any anticipated effect of DACA will occur post-December 2012 during the 2013 Spring semester and beyond.

Results

Descriptive Statistics

Table 1 presents select descriptive statistics by legal status and college type for cohorts who entered college during the Spring semester of 2010 to the Fall semester of 2012. Overall, the findings indicate that undocumented students who overcome barriers to attend college are positively selected relative to their legal status peers (i.e. legal permanent residents and citizens) in their respective institutions. At community colleges, undocumented students have high school GPAs that are .027 standard deviations below the sample mean compared to students with legal status who have high school GPAs that are 0.44 below the sample mean. Likewise, undocumented students at 4-year colleges have high school GPAs that are .69 standard deviations above the sample mean compared to their legal status peers who have GPAs that are only .47 standard deviations above the sample mean. Overall, the descriptive results indicate that undocumented students are significantly more academically prepared compared to their legal status peers.

The fact that undocumented students are more academically prepared than their peers with legal status likely accounts for why they also have higher college GPAs at both community colleges (0.03 vs. -0.14 standard deviations) and 4-year colleges (0.16 vs. 0.11 standard deviations). In terms of credits completed, the results indicate that undocumented students complete more credits per semester than their legal status peers at community colleges (7.59 vs. 7.44 credits completed) but not at 4-year colleges (10.77 vs. 10.92 credits completed).

While approximately 80 percent of CUNY students with legal status receive need-based financial aid in the form of federal Pell grants at both community and 4-year colleges, undocumented students are ineligible for federal financial aid to offset the cost of college.

Effects of DACA on Academic Outcomes

We first examine the effect of DACA on dropout rates at community and 4-year colleges. We begin by replicating results from Hsin and Ortega (2018) on the effect of DACA on dropout rates to establish a baseline for our estimates of heterogeneous effects. First, we estimate the flexible specification from Eq. (2) and plot regression results in Figure 2. Point estimates indicate the estimated difference in likelihood to dropout between undocumented students and their peers with legal status for each semester from the Fall of 2011 to the Fall of 2014. 95-percent confidence intervals are also plotted. The gray shaded areas refer to the post-DACA period. Estimates parallel the results from Hsin and Ortega (2018). They show that DACA had no significant effect on the dropout rates of undocumented students at community colleges, but it significantly increased the dropout rates of students at 4-year colleges. Next, we present difference-in-difference results in Table 2. These results also indicate that DACA increases dropout rates at 4-year college but has no effect at community colleges.

Next, we examine the effect of DACA on academic performance (GPA). Figure 3 plots regression results from flexible fixed effect specifications estimating the effect of DACA on college GPA at community and 4-year colleges. These results indicate that DACA had no significant effect on the college GPA of undocumented students at community colleges, but it significantly reduced the GPA of undocumented students attending 4-year colleges. At 4-year colleges, we see that that the estimated difference in GPA between undocumented and students

with legal status are statistically insignificant in the pre-DACA years (Fall 2011 to Fall 2012), but in the post-DACA years, undocumented students begin to underperform relative to their legal status peers.

Table 3 presents results from difference-in-difference estimates of the effect of DACA on college GPA at community and 4-year colleges. The results quantify the patterns we observed in Figure 3. There is a stronger negative effect on GPA at 4-year but not community colleges. They show that DACA reduced the college GPA of undocumented students at 4-year colleges by .077 standard deviations but had no significant effect on the students at community colleges.

Overall, the results indicate that DACA has stronger negative effects on the dropout rates and academic performance of students attending 4-year colleges than students at community colleges.

Heterogeneous Effects of DACA on Academic Outcomes

Why did DACA have a significant negative effect on the academic performance and retention of undocumented students attending 4-year colleges but not community colleges? Further investigation that takes into account potential heterogeneous effects of DACA offers some insights. We stratify our sample by students who, prior to DACA, were academically high versus low performing and by students who took on a heavy versus low course-load.

We begin by examining heterogeneous effects of DACA on dropout rates. Table 4 stratifies difference-in-difference regressions on dropout rates by low and high performing and by light and heavy course-load at community and 4-year colleges. The results indicate 2 noteworthy findings. First, our analysis shows that students who take heavy course-loads prior to DACA were more likely to drop out at both community and 4-year colleges. These results

confirm our hypothesis that DACA encouraged students who may have been reluctant to work without authorization to increase employment activities to the detriment of college attendance. On the other hand, DACA has no significant effect among students who were already working many hours. The second noteworthy finding is that DACA has a significant effect in increasing dropout rates among previously high performing students at 4-year colleges but no significant effect on previously low performing students at 4-year colleges. Together these results suggest the main reason DACA reduces college retention at 4-year colleges is because the introduction of work authorization motivates high performing, academic engaged students who are taking the most course-credits to leave school, presumably to work. Examining heterogeneous effects also uncovers new findings on the effect of DACA on dropout rates at community colleges. Whereas Hsin and Ortega (2018) found no significant effects of DACA at community colleges, we find that DACA lowers retention of community college students who take the heaviest course-load.

Next we move to considering heterogeneous effect of DACA on college GPA. The pattern of results presented in Table 5 mirror the pattern of results for dropout rates. In general the results indicate that DACA has larger negative effects on college performance among the most academically engaged students—those who are the highest performing and those who take the most courses—than among less academically engaged students. These results are similar for students at community colleges and at 4-year colleges. For example, at four-year colleges, we see that students who took on a heavy course-load saw their GPA significantly decline by 0.079 standard deviations, while at community colleges the decrease was also significant at 0.077 standard deviations. We likewise speculate that students enrolled in a heavy course-load prior to DACA were less likely to be working relative to those taking a light course-load, and thus the introduction of DACA had a negative impact on their ability to balance work and schooling.

It is interesting to note that the estimated coefficient on the effect of DACA among low-performing students and students who take light course-loads at community colleges is positive. The estimated effect of DACA on low-performing students at community colleges is a 0.053 standard deviation increase in college GPA; the estimate effect on students who take light course-loads is a 0.002 standard deviation increase in college GPA. While neither of these estimates are statistically significant at conventional levels of statistical confidence, these positive coefficients may indicate that there are potentially positive effects of DACA on college performance for certain subgroups that we are unable to identify with our data.

Discussion and Conclusion

In this paper, we examined DACA's effect on the academic performance and dropout rates of undocumented students enrolled in CUNY at the time of the policy's implementation. Our results suggest that the effects of DACA on these academic outcomes are heterogeneous and dependent on students' prior work commitments. As such, DACA's downward pressure on educational outcomes appears to be driven primarily by most academically engaged undocumented college students – i.e., those who were academically high performing and taking on a heavy course-load – while it conversely had a negligible impact on undocumented students who were academically underperforming and those maintaining a light course-load. We note these findings to be broadly consistent among undocumented students attending both community and 4-year colleges.

We speculate that DACA's heterogeneous effects can be explained by the employment status of undocumented students prior to DACA. Even before the implementation of the work-permit program, many undocumented students were already employed without work authorization in order to help financially support their family and finance their college education.

For these students, DACA and the legal work opportunities it offered had a limited impact on their college GPA because their existing work commitments were already likely to be extracting a toll on both their academic performance and the weight of their course-load. In contrast, the implementation of DACA had more detrimental ramifications for students who were high achieving and committed to a heavy course-load because they were less likely to be working or working fewer hours. Many high achievers may have been prioritizing schooling over working simply due to the lack of legal employment opportunities rather than because of their financial stability. Offering such students access to more alluring work options via DACA (particularly legal jobs that are less likely to be characterized as menial, physically demanding, and precarious) may have incentivized high performing students to reduce their time dedicated to schooling and redirect their energies toward hitherto unavailable employment opportunities, consequently leading to a decline in their academic performance and retention rates. It is also worth reiterating that the actual treatment effect of DACA should be twice as large as the intent-to-treat effects reported in this study because less than half of those eligible in New York have actually applied for DACA.

Our argument of DACA's heterogeneous effects may help reconcile conflicting findings in the existing literature. Previous studies may have shown negative, neutral, and positive effects of DACA on various educational outcomes (Amuendo-Dorantes and Antman 2017; Hsin and Ortega 2018; Kuka et al. 2018; Pope 2016) because there were unobserved heterogeneous effects. For instance, Hsin and Ortega's (2018) finding that DACA increased the dropout rates of undocumented students at 4-year but not community colleges obscured the reality that low academically performing students at 4-year colleges did not see increases in their dropout rates,

while high achievers at community colleges (specifically those who were enrolled in a heavy course-load) saw their dropout rates significantly increase.

More broadly, our findings suggest that DACA discourages undocumented youth from making further investments in their schooling over immediate labor market returns. This effect is especially pronounced among previously high performing and committed college students, who appears to have disinvested from their education in order to take advantage of DACA's legal work permits. We speculate that such a response may be attributed to two factors. First, the temporary nature of DACA and the political uncertainty over the program's future could discourage students from fully investing in their education. That is, undocumented youth may be inclined to prioritize immediate labor market outcomes over their educational outcomes while they have tenuous access to the former. In contrast, permanent legalization may encourage undocumented students to take a long-term view of their educational investments and correspondingly encourage better academic outcomes (e.g., lower dropout rates, higher GPA).

Second, undocumented youth may be prioritizing working over schooling because of their financial constraints. Most families headed by undocumented parents subsist at or near the poverty line (Amuendo-Dorantes and Antman 2017; Gonzales et al. 2014), and undocumented youth may be predisposed to obtain a job in order to support themselves and their family. We therefore expect that a program like DACA would have negative effects on undocumented college students' educational outcomes insofar as it removes legal barriers to employment without creating risks of deportation. We further note that the tradeoffs between working and education is not limited to those who lack legal status, and that U.S.-born working-class populations likewise face the same underlying dilemma that impede upwards social mobility.

These challenges are particularly acute at a time of record high student debt, predatory for-profit colleges, and credential inflation that raise the stakes of obtaining a college education.

This paper is not without several caveats. Notably, the generalizability of our findings to other regions of the country may be limited. More undocumented immigrants reside in New York City than any other metropolitan area and 80% of undocumented students who attend college attend CUNY (DiNapoli and Bleiwas 2014). Thus, while our study is largely representative of undocumented college students who reside in NYC, it is not representative of undocumented students at the national level, and we cannot know whether our findings would hold in a different context where students are offered different levels of financial and social support for college. However, we may reasonably speculate that DACA would have more negative effects on educational outcomes in environments where the costs of attending college are substantial. For instance, a progressive state like California allows for both in-state tuition rates and state financial aid, which significantly lowers the barriers to college attendance. As a consequence, undocumented students may be less tempted by DACA to find employment for financial reasons, prioritizing instead an investment in education in order to maximize their future returns. Conversely, in a more immigrant-hostile state like Georgia, undocumented students are banned from attending the state's top five public schools, and they are required to pay out-of-state tuition for all other state public institutions. In such an environment, undocumented students may be even more tempted by DACA to prioritize working over schooling because the barriers of attending college are onerous. New York may be considered a moderately immigrant friendly state because it allows resident undocumented youth to pay in-state tuition at CUNY but does not provide access to state-funded financial aid or work-study programs.

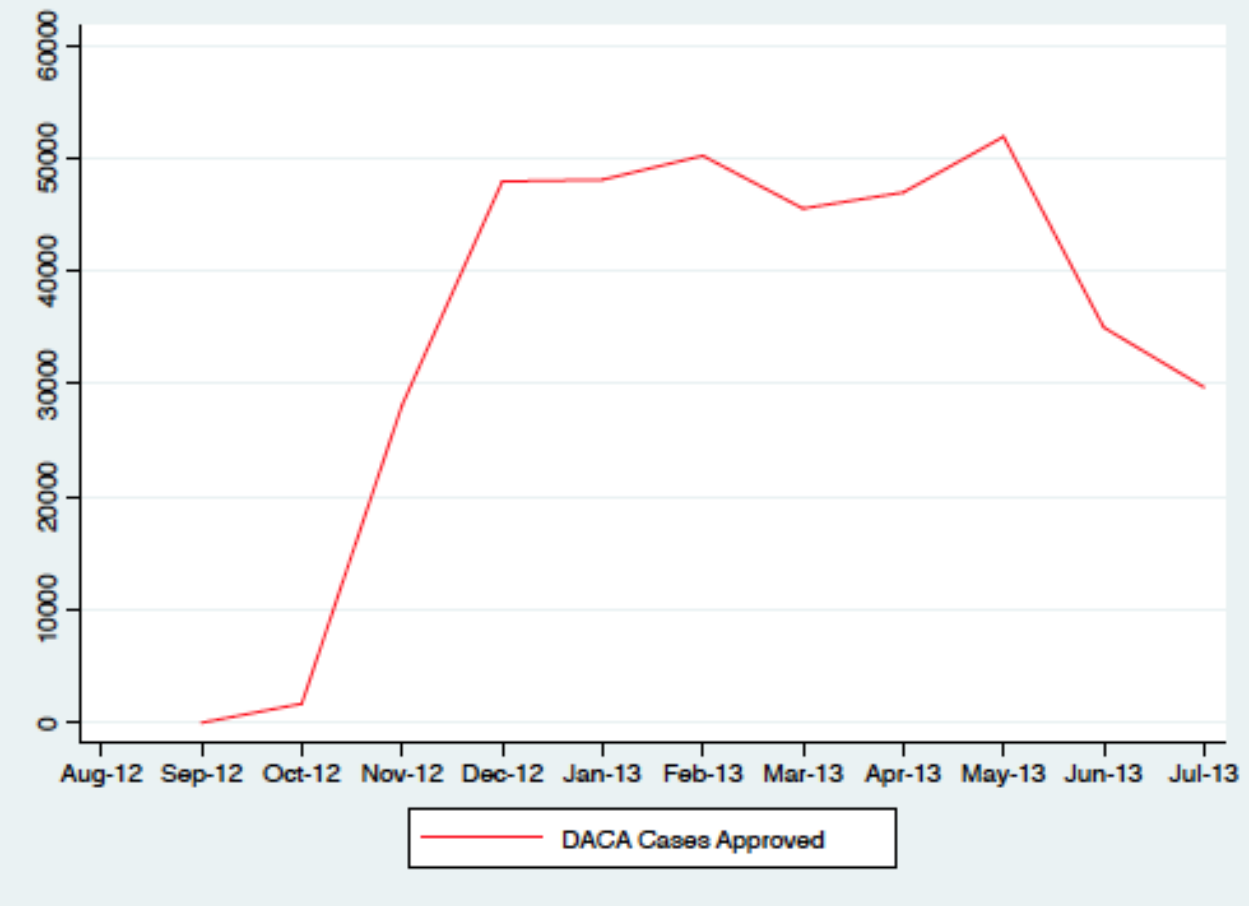
Moreover, while our findings show either negative or no effects of DACA on retention and academic performance, we also find positive, albeit insignificant, effects of DACA on academic performance for some subgroups. Specifically, the estimated coefficients of the effect of DACA on college GPA among the least engaged community college students—those who are taking few courses and are low performing—are positive but not statistically significant at conventional standards of statistical significance. These findings raise the possibility that DACA may have positive effects on certain subgroups. For example, DACA may help foster the academic achievement of low-performing students who were working many hours in inflexible, low-paid jobs that offered poor work conditions. Work authorization may have allowed these students to find better jobs with higher pay and more flexible hours that accommodate schoolwork. As a result, work authorization for these types of students may mean that they can devote more time and energy to schoolwork. While we do not find strong, pervasive evidence of positive effects, we also cannot rule out the possibility that positive effects may exist for some students.

Finally, several studies have argued that DACA helps motivate students who would not have otherwise attended college to enroll and purse higher education (Kuka et al. 2018; Wong, Garcia, and Valdivia 2018). In this study, we examine the effects of DACA on retention and academic performance among students who were already enrolled in college prior to introduction to DACA. Thus, our study cannot address the question of whether DACA affected the propensity to attend college.

In sum, our study find that DACA may have heterogeneous effects on undocumented college students' educational outcomes. Specifically, we argue that DACA has a significant negative on previously high achieving students because they were less likely to be working,

while it had little impact on previously low achievers because they were already like to be working. More broadly, we speculate that DACA does not encourage undocumented youth from fully investing in their education because of the uncertainty over the program's future and because their socioeconomic disadvantages encourage them to prioritize work over schooling. We anticipate that if efforts at offering a pathway to permanent residency and removing barriers to higher education are realized, undocumented students would respond more positively to incentivizes for greater educational outcomes over immediate labor market returns.

Figure 1. DACA approvals over time



Source: Data available at USCIS (2014)

Table 1. Descriptive statistics by legal status and college type

	Community college				4-year college			
	Undocumented		LPR + Citizens		Undocumented		LPR + Citizens	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
College GPA (standardized)	0.03	0.99	-0.14	1.03	0.16	0.91	0.11	0.96
Credits completed per semester	7.59	5.25	7.44	5.15	10.77	4.67	10.92	4.62
High school GPA (standardized)	-0.27	0.92	-0.44	0.87	0.69	0.83	0.47	0.91
Pell grant recipient	0%		81%		0%		80%	
Female	51%		53%		54%		53%	
Country of birth								
USA	0%		70%		0%		74%	
Latin America	50%		4%		35%		1%	
Asia	16%		6%		28%		7%	
Caribbean	22%		11%		24%		6%	
Other	18%		9%		17%		12%	
N	1,308		66,658		1,361		54,422	

Figure 2. Dropout rates

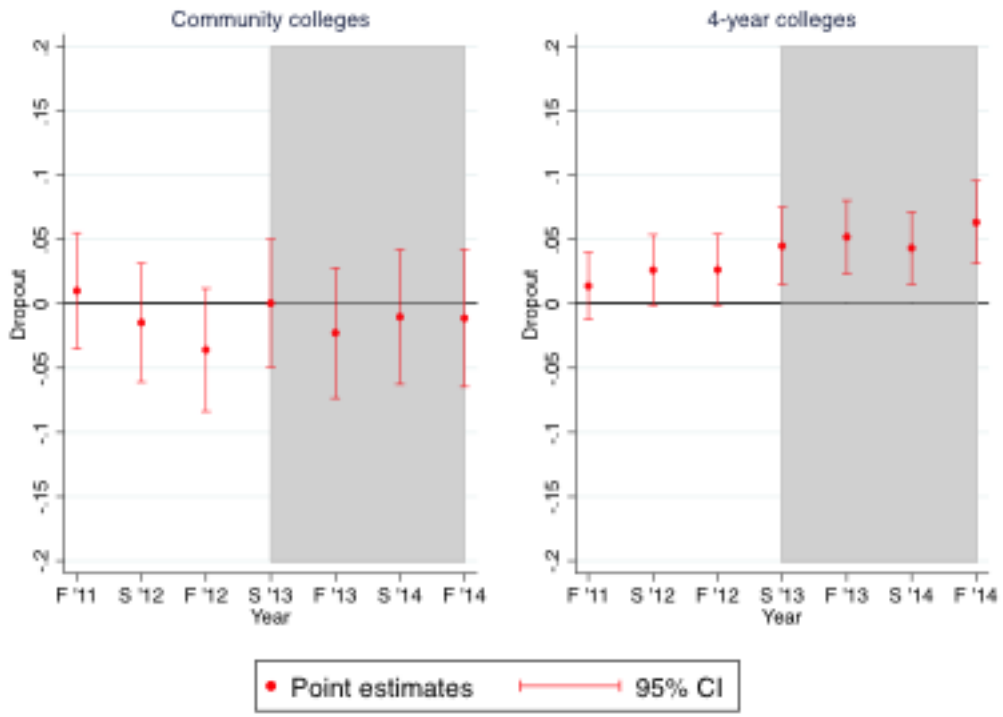


Table 2. Difference in-difference results, dropout

	(1) community college	(2) 4-year college
DACA x Undocumented	0.010	0.021**
	(0.008)	(0.005)
R^2	0.02	0.01
No. individuals	57,974	53,142

Figure 3. GPA

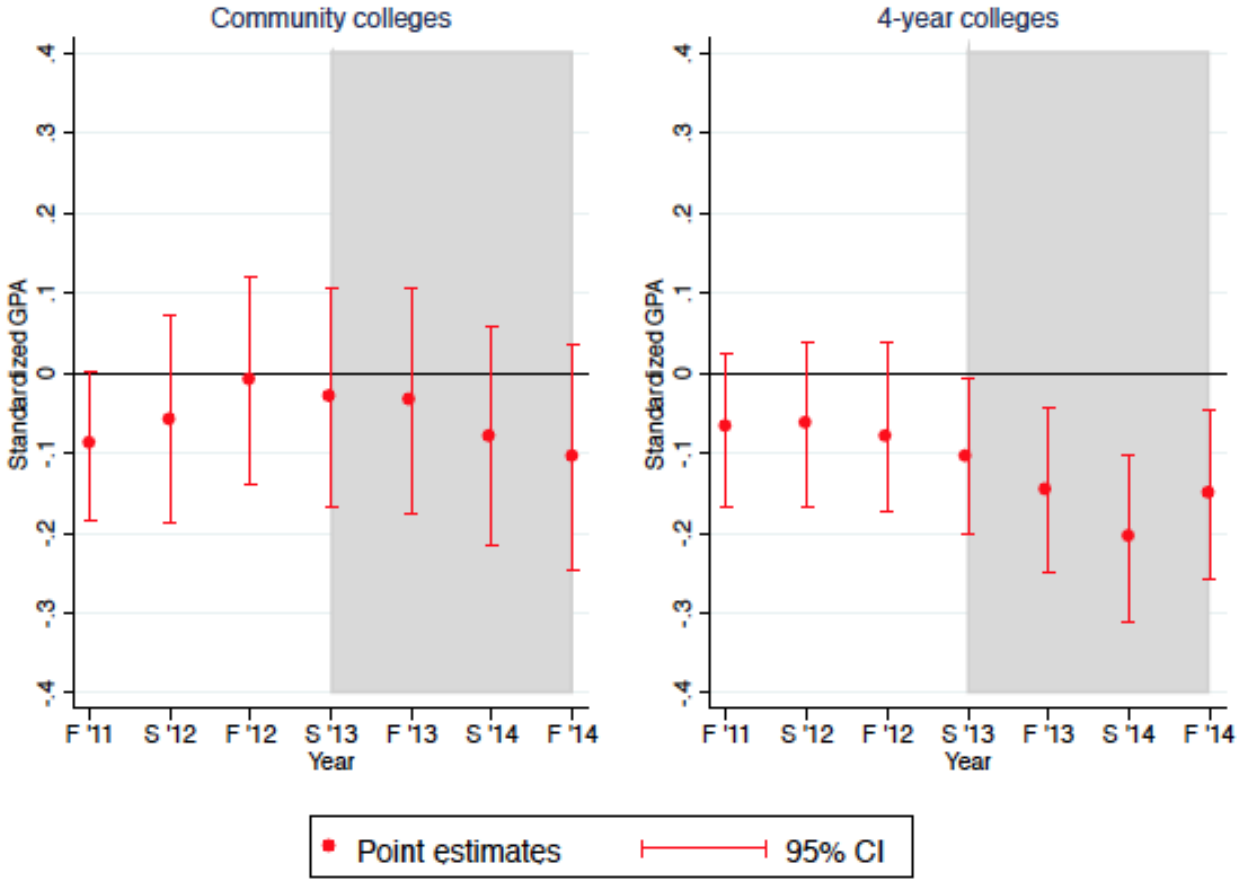

Community colleges
4-year colleges
Standardized GPA
-.4
-.3
-.2
-.1
0
.1
.2
.3
.4
F '11
S '12
F '12
S '13
F '13
S '14
F '14
Year
Point estimates
95% CI

Table 3. Difference-in-difference results, GPA

	(1) community college	(2) 4-year college
DACA x Undocumented	-0.04	-0.077***
	(0.029)	(0.021)
R^2	0.02	0.01
No. individuals	57,974	53,142

* $p<0.1$; ** $p<0.05$; *** $p<0.0$

Table 4. Difference-in-difference results, dropout, heterogeneous effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Community college				4-year college			
	Low performing	High performing	Light course-load	Heavily course-load	Low performing	High performing	Light course-load	Heavily course-load
DACA x Undocumented	0.007	-0.001	0.003	0.011*	0.01	0.029***	0.012	0.028***
	(0.016)	(0.007)	(0.013)	(0.007)	(0.008)	(0.005)	(0.008)	(0.004)
R^2	0.09	0.01	0.01	0.00	0.09	0.00	0.02	0.01
N	57,974	53,142	57,974	53,142	57,974	53,142	57,974	53,142

Table 5. Difference-in-difference, GPA, heterogeneous effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Community college				**4-year college**			
	Low performing	High performing	Light course-load	Heavily course-load	Low performing	High performing	Light course-load	Heavily course-load
DACA x Undocumented	0.053	-0.086***	0.002	-0.077**	-0.078	-0.077***	-0.052	-.079***
	(0.064)	(0.028)	(0.040)	(0.034)	(0.050)	(0.020)	(0.055)	(0.022)
R^2	0.02	0.03	0.02	0.03	0.02	0.02	0.03	0.02
N	57,974	53,142	57,974	53,142	57,974	53,142	57,974	53,142

* $p<0.1$; ** $p<0.05$; *** $p<0.0$

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