Developmental Education Reform and the Racial/Ethnic Achievement Gap: The Case of First-Semester Gateway Course Passing Rates When Florida Made Developmental Education Optional

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Background: *Developmental education (DE) has been critiqued because of its high cost, the inconclusive evidence as to its effectiveness, and the overrepresentation of underrepresented minority students required to take it. Because Black and Hispanic students are more often referred to developmental courses and may require more levels of remediation, a significant racial/ethnic achievement gap between White students and underrepresented minority students has formed in the likelihood of students earning credit for college-level courses in their first semester.*

Focus of Study: *To address these concerns, the Florida legislature passed Senate Bill 1720 in 2013, which, among other mandates, made DE (and placement tests) optional for many students. Now that this barrier to gateway course enrollment has been removed, this article seeks to understand whether there was any relationship between its removal and the achievement gap between White students and underrepresented minority students in gateway course passing rates, or gateway success, in the first semester.*

Research Design: *We employed a difference-in-differences model estimating the relationships between students' race/ethnicity and their success in gateway courses, specifically English Composition 1 and Intermediate Algebra. Interaction terms between an indicator for the year the policy was implemented and indicators for race/ethnicity allow us to determine whether Black, Hispanic, and White students experienced differential outcomes following the policy change.*

Data Collection: *Data for this analysis came from the Florida Education Data Warehouse, the statewide student-level longitudinal database. We examined the first-semester educational trajectories of Black, White, and Hispanic students across six cohorts of students who entered one of the 28 colleges in the Florida College System between 2009 and 2014.*

Findings: *The findings indicate that now that students have the option to bypass developmental courses, Black and Hispanic students are enrolling in gateway courses at higher rates compared with White students. Further, although course-based passing rates have declined, the cohort-based passing rates for Black and Hispanic students have increased at rates higher than those of White students, which provides some evidence that the achievement gap may be closing in Intermediate Algebra.*

Conclusions: *This study illuminates an important positive outcome that has far-reaching policy implications. Results suggest that by making DE optional, there can be a reduction in, and indeed the elimination of, the racial/ethnic achievement gap in at least one measure of student success in college. These findings suggest that eliminating barriers can have a strong positive impact—at least in the short term—on the success of Black and Hispanic students.*

Developmental education (DE)—coursework taken after high school that does not yet count for college credit—has gained significant scholarly and public policy attention in recent years because of the high cost of providing it, the inconclusive evidence as to its effectiveness, and the overrepresentation of underrepresented minority students required to take it (Alliance for Excellent Education, 2011; Complete College America, 2012; Martinez & Klopott, 2005). DE is also known as remedial coursework or, in

some cases, college-prep coursework, and is in contrast to gateway courses, or the first college-credit-bearing course in a sequence. Indeed, recent estimates reveal that whereas 55% of White students are placed directly into college-level (gateway) math using traditional placement tests, only 14% of Black students and 19% of Hispanic[1] students are placed into gateway math in the first semester (Bailey, Jeong, & Cho, 2010). This is crucial, because enrollment in remedial courses is associated with decreased likelihood of several measures of college success, including passing the college-level math or English course, persisting, earning a diploma, and passing 10 transfer-level courses within four years (Clotfelter, Ladd, Muschkin, & Vigdor, 2014). Further, relative to White students, African Americans and Hispanics are less likely to pass each level of the developmental math sequence (Fong, Melguizo, & Prather, 2015). As such, a significant racial/ethnic achievement gap between White students and underrepresented minority students has formed in the likelihood of students earning credit for college-level courses in the first semester of their studies, particularly in environments of strict/sole reliance on traditional DE placement tests.

Course assignments matter; research has shown that being placed into developmental math, reading, or writing decreases a student's likelihood of ever taking or passing a college-level math or English course (Clotfelter et al., 2014; Scott-Clayton & Rodriguez, 2015). When students are placed into developmental courses, they spend time in courses that yield no academic value, end up behind others who entered in their cohort, and expend finite financial resources (e.g., federal financial aid) on credits that do not count toward a degree (Bailey & Jaggars, 2016). Research has also demonstrated that some students who could have been successful in gateway courses are instead placed into developmental courses by inaccurate placement policies—a finding that is particularly true for underrepresented racial/ethnic students (Scott-Clayton, 2012).

Given these concerns, many states have turned to policy initiatives that have reduced or eliminated required developmental courses entirely. In particular, California, North Carolina, and Virginia have augmented their placement process to no longer rely solely on placement tests. Compared with these states, however, Florida took a more extreme step in 2013: The legislature passed Senate Bill 1720 (SB 1720) which, among other mandates, made DE itself (as well as placement tests) optional for students who entered a Florida public high school in the 2003–2004 academic year or later and subsequently earned a traditional high school diploma or were active duty military personnel, regardless of prior academic preparation. The goal of all these reforms is similar: to provide more students with the opportunity to directly enroll in gateway courses without first requiring students to take and pass DE courses before being granted entry into

gateway courses. Now that this barrier to gateway course enrollment—a barrier that has faced scrutiny as to its effectiveness and equity—has been removed, we sought to better understand whether there was any relationship between its removal and the achievement gap between White students and underrepresented minority students in gateway course passing rates, or gateway success, in the first semester.

LITERATURE REVIEW

Three major bodies of work inform our literature review. First, we provide additional context around the soaring number of students required to take developmental coursework and the racial/ethnic disparities in enrollment in these courses. Second, we discuss how such racial/ethnic disparities are related to overall gaps in college success. Third, we detail recent efforts across the country that aim to reduce the number of students required to take developmental courses and how these reform measures relate to the racial/ethnic achievement gap in postsecondary success.

DEVELOPMENTAL EDUCATION

Historically, DE has contributed to greater accessibility in postsecondary education by helping underprepared students develop not only their specific subject area knowledge but also their study skills and general academic habits (Bailey, Bashford, Boatman, Squires, & Weiss, 2016). Recent estimates indicate that over half of all students seeking an associate's degree—a total of 1.7 million beginning students—require at least one developmental course (Bailey et al., 2010; Complete College America, 2012). Over $3 billion is spent each year providing DE (Alliance for Excellent Education, 2011). In Florida alone, 70% of first-time-in-college (FTIC) community college students are enrolled in at least one developmental course, which cost $154 million during the 2009–2010 academic year (Underhill, 2013).

The existence of racial differences in DE enrollment and success is well documented in previous research (Attewell, Lavin, Domina, & Levey, 2006; Perry, Bahr, Rosin, & Woodward, 2010; Ross et al., 2012). Using the National Education Longitudinal Study of 1988, Attewell and colleagues (2006) found an 11% difference between Black and White students' probability of being enrolled in DE. Similarly, Bettinger and Long (2005) found that in a sample of traditional-age community college students in Ohio, more than 75% of Black and Latino students were initially placed into developmental math in the first semester of study, compared with 55% of White students; similar differences were also found for assignment to developmental English. Further, Bailey and colleagues (2010)

examined a sample of Achieving the Dream community colleges across 15 states, which tended to represent more low-income, urban, and minority students than the national community college student population. The authors found that among those needing DE, Black and Hispanic students needed more levels of remediation (Bailey et al., 2010). These disparities often have lasting effects, as we discuss in the next section.

DEVELOPMENTAL EDUCATION PLACEMENT & REFORM

Students who finish high school but are told they do not have the necessary academic preparation to succeed in college are left with few options: either not enrolling in college at all or enrolling at a less selective or open-access (often community) college. Those entering the community college are likely placed in developmental courses based on placement test cut scores. However, there is ample evidence that accurate placement into appropriate courses by these mechanisms is mediocre at best, and often inaccurate and harmful to students' progress (e.g., Scott-Clayton, 2012; Scott-Clayton, Crosta, & Belfield, 2014). That is, placement mechanisms often do not result in placement into a course that is directly tied to progress toward a degree or certificate (or other academic goal) and in which a student can be successful and also challenged—hence, a "misplacement." In addition, there is evidence that placement exams have more predictive power for placement into math, as compared with English (Scott-Clayton, 2012). To combat these imperfect placement tools, high school transcript data have been used to determine students' appropriate course placement. Scott-Clayton et al. (2014) found that using high school grade point average (GPA) was shown to reduce severe misplacements by 12%– 30% when compared with using test scores alone.

However, altering methods of determining placement may have differential effects by race/ethnicity. By using high school transcript data, a simulation study indicated that more Hispanic students would be placed into college-level math, but fewer Black students would be placed into college-level English (Scott-Clayton et al., 2014). The authors concluded that using GPA resulted in fewer misplacements overall and within each racial/ethnic group, but noted that some groups do better in certain subjects than others. In another study, Ngo and Kwon (2015) found that using multiple measures marginally increased access to higher level courses for Black and Hispanic students, though this finding was limited to only some colleges in their sample. In a comparison of different combinations of test scores and high school preparation measures, Marwick (2004) found that when using a multiple-measures placement policy, Latino students were placed into higher level math courses where they could be successful at

rates equal to or higher than when only test scores or high school preparation was used for placement.

Whereas much of the aforementioned research focused more narrowly on DE placement, several states have implemented widespread comprehensive DE reforms resulting in concurrent changes to placement policies, instructional modalities, advising, and student support services. The Virginia Community College System implemented a new math placement test on which students had to demonstrate proficiency on a specific set of modules given their intended major-course pathway or degree program. Thus, the goal was "to increase the rate of college-level math placements by reducing the developmental math requirements for liberal arts programs" (Rodriguez, 2014, p. 2). Across the system, placement into college-level math more than doubled compared with students in previous cohorts using a different placement test. In addition, among students who placed into college-level math, more students passed their course (18% compared with 8% in the previous cohort; Rodriguez, 2014). In the following year, Virginia revised the math curriculum as well. Just recently, North Carolina implemented a similar multistage developmental redesign, including the statewide use of high school GPA as a placement measure (Kalamkarian, Raufman, & Edgecombe, 2015). Because many of these statewide policies have been implemented recently, long-term results and results disaggregated by racial/ethnic group are not yet available. One exception is Tennessee, where corequisite math and English courses were implemented, and pre- and postreform pass rates of the college-credit-bearing courses were compared. Pass rates for underrepresented racial/ethnic students rose from 6.7% to 41.8% in math and from 18.6% to 63.5% in English (Denley, 2015).

Another example is California, which implemented a multiple-measures placement policy earlier than many other states. Indeed, a main reason that California first implemented a multiple-measures placement policy was a suit brought against the statewide community college system by the Mexican American Legal Defense and Education Fund, which argued that the assessment process tracked Latinos into developmental courses, limiting their access to college-level coursework (Perry et al., 2010). The result of the lawsuit obligated the colleges to consider other placement mechanisms, such as high school transcript data, that have been shown to have greater predictive power of student success (Melguizo, Kosiewicz, Prather, & Bos, 2014).

Unlike California, the recent Florida legislation was not the direct result of any legal case concerning civil rights. However, the legislation does give certain exempt students the option to forgo placement tests and enroll directly in college-level courses instead of DE, where racial/ethnic students

have been historically overrepresented. As such, we sought to better understand whether underrepresented racial/ethnic students are more likely to be enrolled in developmental courses and whether there has been a change in the racial/ethnic achievement gap for students earning credit in college-level courses following the implementation of Florida's developmental education reform. Although previous research has investigated overall patterns of student enrollment and course passing rates following the DE reform in Florida (Hu et al., 2016), to the best of our knowledge, no peer-reviewed study has investigated how the recent reform may have affected the racial/ethnic achievement gap.

RACIAL DISPARITIES IN COLLEGE SUCCESS

Although college enrollment rates for Black and Hispanic students have increased over time, college completion rates have stagnated, and there remains a sizeable racial/ethnic gap in postsecondary attainment (Bound, Lovenheim, & Turner, 2009; Bowen, Chingos, & McPherson, 2009; Turner, 2004). Recent estimates from the U.S. Census Bureau (Ryan & Bauman, 2016) indicate that whereas 32.8% of non-Hispanic White adults aged 25 and older possess a bachelor's degree or higher, only 22.5% of Black adults and 15.5% of Hispanic adults have achieved the same level of educational attainment. A traditional human capital perspective would suggest that the racial/ethnic gap in college completion is due to insufficient college preparation of Black and Hispanic students and that the gap is not a function of racial/ethnic background (Becker, 1964; Becker, Murphy, & Tamura 1994; Mincer, 1974; Neal & Johnson, 1996; Rivkin, 1995). However, an increasing number of studies have found that even after controlling for additional demographic and precollege academic preparation, completion for Black and Hispanic students remains lower compared with that of White students (e.g., Arcidiacono & Koedel, 2014; Fletcher & Tienda, 2015; Provasnik & Planty, 2008).

Historically, educational opportunities provided for students with similar college preparedness are not equally distributed among students with different racial/ethnic backgrounds. For example, underrepresented racial/ethnic students are more likely to attend underresourced high schools, which is one of many contributing factors to their limited preparation for college. Gándara, Alvarado, Driscoll, and Orfield (2012) found that one third of Latino students and 20% of Black students attended low-resourced high schools, compared with just 4% of White and 10% of Asian students. Sedlacek (2004) claimed that schools where White students are the majority present some challenges for underrepresented racial/ethnic students because of cultural differences. Some of these challenges include

negotiating racism and prejudices within educational systems, assessing personal abilities within a context that may be discriminatory, and persevering through the culture shock of the college transition. Bernal, Cabrera, and Terenzini (2000) explained that White students' academic and career outcomes can, in most cases, be explained by other factors such as prior academic preparation and socioeconomic status, but the same does not hold true for underrepresented racial/ethnic students, especially for Black and Hispanic students. Thus, the higher education achievement gap across race and ethnicity can be explained by school readiness and socioeconomic status in part; however, there are some unobservable barriers to success, such as problematic placement tools and policies that result in differential rates of DE enrollment by race/ethnicity, which underrepresented racial/ethnic students face with overwhelming evidence (Bailey et al., 2010; Center for Community College Student Engagement, 2016; Ngo & Kwon, 2015; Scott-Clayton et al., 2014). However, these barriers are not easily accounted for in traditional analyses. Thus, the college completion gap across race/ethnicity is not explained solely by prior academic preparation and other characteristics such as socioeconomic status. In this article, we focus on a particular obstacle faced by many Black and Hispanic students: being advised into developmental courses on arriving at college.

FLORIDA CONTEXT AND RESEARCH QUESTIONS

We use the Florida College System (FCS) to examine racial/ethnic gaps in remedial education. In 2014, Florida witnessed drastic changes in DE policy through Senate Bill 1720 (SB 1720). The new law mandated that the 28 state colleges (formerly the community colleges) in the FCS provide DE that is more tailored to the needs of students, giving some students the choice to not participate at all, and altered the rules of how DE is offered and for whom it is required. Under the new legislation, students who entered ninth grade in a Florida public school in the 2003–2004 school year and beyond are considered college ready—provided they earned a standard high school diploma. Thus, the law prohibits requiring placement testing or DE courses for these students. It also exempts active duty members of the military from placement testing and developmental coursework. Historically, many of these students would have been required, based on their performance on a placement exam, to take and pass DE courses before taking introductory college-level (gateway) courses.

In addition to these changes in the placement policies, developmental courses themselves were redesigned to better suit students' needs.

Specifically, developmental courses were required to be taught in at least two of the following course modalities: corequisite, contextualized, compressed, or modularized. Each curricular option was designed to move students more quickly through their developmental courses with a higher level of success. Corequisite courses provide additional supports to students also enrolled in a gateway course; compressed courses were shortened into 6- or 12-week courses; contextualized courses embedded basic skills with major-course content; and modularized courses were self-paced, usually on the computer, and students were only required to complete modules in which they were not proficient.

Previous research on the recent Florida reform has demonstrated that enrollment in developmental courses between the pre- and postpolicy periods has declined by approximately 11–21 percentage points for all students (Hu et al., 2016). Following these declines in enrollment in DE courses, enrollment in gateway math and English courses increased after the implementation of SB 1720. Course-based passing rates declined by approximately 3 percentage points in English Composition 1 and 9 percentage points in Intermediate Algebra. However, when considering success for all FTIC students in the cohort, pass rates improved between the pre- and postpolicy periods. That is, cohort-based pass rates increased approximately 9 percentage points in English and 6 percentage points in Intermediate Algebra (Hu et al., 2016).

In this study, we investigated how different racial/ethnic groups may experience the recent reform and whether Florida has witnessed any changes in the racial/ethnic achievement gap now that barriers have been removed by making placement tests and DE optional. Specifically, we asked: (1) To what extent is students' racial/ethnic background related to the likelihood of enrolling in developmental reading, writing, and math courses before and after the implementation of SB 1720, holding constant other measures of individual characteristics and prior academic preparation? (2) In comparing the years before and after SB 1720, is there any evidence that SB 1720 is related to the racial/ethnic achievement gap in terms of success in English Composition 1 and Intermediate Algebra for students who enrolled in the courses? (3) In comparing the years before and after SB 1720, is there any evidence that SB 1720 is related to the overall racial/ethnic achievement gap in terms of success in English Composition 1 and Intermediate Algebra for all entering FTIC students in the cohort?

RESEARCH DESIGN

DATA

Data for this analysis came from the Florida Education Data Warehouse (FL-EDW), the statewide student-level longitudinal database maintained by the Florida Department of Education. We examined the first-semester educational trajectories of Black, White, and Hispanic students across six cohorts of FTIC students who initially began their studies in fall semesters 2009–2014 at one of the 28 colleges in the FCS. We limited our sample to include only those students who either qualified for exempt status (in the case of the fall 2014 cohort), allowing them to bypass DE, or who would have qualified for exempt status had the legislation been implemented earlier (in the case of the fall 2009–2013 cohorts).

Our outcome measures include the likelihood of enrolling in DE reading, writing, and mathematics; the likelihood of being enrolled in English Composition 1 and Intermediate Algebra; and the likelihood of passing these gateway courses computed in two ways: course-based gateway passing rates and cohort-based gateway passing rates. The former expresses the likelihood of passing the gateway course for the students actually enrolled in the courses, whereas the latter expresses the likelihood of passing the gateway course of all students entering college for the first time, or the cohort-based passing rate. Whereas the course-based passing rate provides a sense of the likelihood of success for students who actually enrolled in the gateway courses, the cohort-based passing rate gets at a major goal of the reform: to increase the overall number and share of students completing gateway courses. Thus, the cohort-based passing rate and our modeling strategy allow us to determine whether larger shares of White, Black, and Hispanic students in the overall cohort are successful in gateway courses, as well as whether the overall performance of Black or Hispanic students has changed following the reform in ways that are different from that of White students.

In addition, the FL-EDW data set also contains measures of student demographic information (S) and high school academic achievement (HS). Our specific measures for (S) include gender and free/reduced price lunch eligibility. Our specific measures for (HS) include whether the student earned credit in Algebra 2, trigonometry, another advanced math course, honors English, or Advanced Placement (AP) English. Table 1 presents descriptive statistics for our sample, disaggregated by cohort.

Table 1. Descriptive Statistics by Cohort for Exempt and Likely Exempt Black, Hispanic, and White Sample

	Fall 2009		Fall 2010		Fall 2011		Fall 2012		Fall 2013		Fall 2014	
	n	%	n	%	n	%	N	%	n	%	n	%
Student Characteristics												
Race/Ethnicity												
Black	9,674	22.1	9,300	22.5	10,003	23.7	8,442	21.8	9,454	22.8	10,023	23.0
Hispanic	12,653	28.9	12,975	31.4	13,849	32.8	13,111	33.9	14,651	35.3	16,080	36.9
White	21,494	49.0	19,012	46.0	18,397	43.5	17,150	44.3	17,448	42.0	17,427	40.0
Female	23,314	53.2	21,879	53.0	22,184	52.5	20,104	51.9	21,467	51.7	22,753	52.3
Free/Reduced Lunch Elig.	14,902	34.0	14,903	36.1	16,698	39.5	15,902	41.1	19,830	47.7	22,427	51.5
High School Academic Preparation												
Took Alg. 2	32,652	74.5	30,850	74.7	33,589	79.5	32,201	83.2	34,275	82.5	34,521	79.3
Took Trig.	2,835	6.5	2,437	5.9	2,378	5.6	2,039	5.3	1,865	4.5	2,172	5.0
Took Adv. Math	7,747	17.7	7,279	17.6	10,456	24.7	10,077	26.0	9,275	22.3	8,708	20.0
Took AP Eng.	4,580	10.5	4,945	12.0	5,649	13.4	5,634	14.6	5,704	13.7	5,178	11.9
Took Hon. Eng.	21,270	48.5	20,180	48.9	21,758	51.5	21,246	54.9	22,881	55.1	23,056	53.0
N	43,821		41,287		42,249		38,703		41,553		43,530	

ANALYTIC STRATEGY

To address our research questions, we turned to a difference-in-differences estimation technique, specified as follows:

$$\text{logit}(y_{ijt}) = \alpha + \beta_1(2014_t) + \beta_2(Black_{ijt}) + \beta_3(Hispanic_{ijt}) + \varphi(2014_t{*}Black_{ijt}) + \zeta(2014_t{*}Hispanic_{ijt}) + \theta(S_{ijt}) + \gamma(HS_{ijt}) + \delta_j$$

Under this specification, we modeled the academic outcome *y* for student *i* enrolled at college *j* in year *t* using a logistic regression. The vectors *S* and *HS* are composed of our measures of student demographics (other than race/ethnicity) and prior high school academic preparation designed to capture the effect of traditional measures of human capital, while δ_j is a college fixed-effect designed to capture heterogeneous effects across the individual colleges. Then, *2014* is a dichotomous indicator for students in the postreform period (the comparison group is students in the prior cohorts). *Black* and *Hispanic* are dichotomous indicators for student race/ethnicity (the comparison group is White students). We then interacted the indicators for race with the 2014 indicator to determine whether the implementation of the DE policy had a differential effect for Black or Hispanic students. Thus, the estimates for φ and ζ are difference-in-differences estimates that indicate whether course enrollment and passing rates changed for Black or Hispanic students in ways that were different for White students. This strategy allowed us to determine, after accounting for other demographic characteristics and prior academic achievement, whether Black, Hispanic, and White students experienced differences in the policy change—differences that have the potential to alter the racial/ethnic achievement gap in gateway courses.

LIMITATIONS

One limitation to the current study is the way in which we have operationalized our race/ethnicity variable given the available data. In the data provided by the FL-EDW, the race/ethnicity variable offered discrete categories for White, Black, and Hispanic students. Data limitations do not permit students to indicate race and ethnicity separately. In other words, there were no specific racial/ethnic indicators for Black Hispanic students, for example.

Another limitation to this study is that we cannot completely disentangle the effects of the various aspects of the reform from each other. The legislation mandated that all the colleges implement the new placement policy for exempt students and the redesigned course modalities simultaneously. The redesigned curriculum and the course modalities affected all developmental courses for all students, but the placement policies

affected only exempt students. Therefore, we must also consider that the curricular changes may influence our findings. We return to this matter later in our discussion section.

RESULTS

For ease of interpretation, we present our results in the form of predicted probabilities, confidence intervals, and marginal effects. In doing so, we focus on how the predicted probability (or likelihood) of Black, Hispanic, and White students to enroll in DE courses, enroll in gateway courses, and pass gateway courses changed following the implementation of the reform. Then, using marginal effects, we discuss whether the rates of change for Hispanic or Black students were different than those of White students. Finally, by examining the confidence intervals associated with the predicted probabilities of success, we are able to determine whether the predicted probabilities of success for White, Black, and Hispanic students are indistinguishable from one other. That is, if the predicted probabilities for one racial/ethnic group are contained in the confidence intervals of another's, this would suggest that the likelihood of success is essentially the same for both groups—evidence that the racial achievement gap has closed. We present our results for each of our metrics of student success separately.

DEVELOPMENTAL EDUCATION ENROLLMENT

The likelihood of enrolling in DE courses decreased for all students across all three subjects following the reform (Table 2). Specifically, the likelihood of enrolling in DE math decreased for Black (26.99 percentage points), Hispanic (21.55 percentage points), and White (18.94 percentage points) students. All these changes are statistically significant, as are the marginal effects that examined differential rates of change for Black and Hispanic students compared with White students. That is, the rate of decline in the likelihood of enrolling in DE math following the reform was 8.05 and 2.61 percentage points steeper for Black and Hispanic students, respectively, compared with White students. Additionally, Black, Hispanic, and White students were less likely to enroll in DE reading courses by 22.88, 14.79, and 11.78 percentage points, respectively. The rate of decline in the likelihood of enrolling in DE reading for Black and Hispanic students compared with White students was 11.1 and 3.01 percentage points, respectively. Finally, Black, Hispanic, and White students were less likely to enroll in DE writing courses by 17.66, 8.55, and 7.31 percentage points, respectively. Compared with White students, the rates of decline in the likelihood of enrolling in DE writing courses for Black and Hispanic students were 10.35 and 1.2 percentage points higher, respectively.

Table 2. Development Education Enrollment Rates

Mathematics								
	2009–2013	**Confidence Intervals**		**2014**	**Confidence Intervals**		**Diff.**	
Predicted Probabilities								
Black	43.91%	43.43%	44.40%	16.93%	16.23%	17.63%	-26.99	***
Hispanic	37.92%	37.53%	38.31%	16.36%	15.80%	16.93%	-21.55	***
White	32.91%	32.58%	33.24%	13.97%	13.46%	14.48%	-18.94	***
Marginal Effects								
Black vs. White							-8.05	
Hispanic vs. White							-2.61	
Reading								
	2009–2013	**Confidence Intervals**		**2014**	**Confidence Intervals**		**Diff.**	
Predicted Probabilities								
Black	30.46%	30.02%	30.91%	7.58%	7.12%	8.04%	-22.88	***
Hispanic	21.40%	21.07%	21.72%	6.61%	6.25%	6.97%	-14.79	***
White	15.40%	15.15%	15.65%	3.62%	3.36%	3.88%	-11.78	***
Marginal Effects								
Black vs. White							-11.1	***
Hispanic vs. White							-3.01	***
Writing								
	2009–2013	**Confidence Intervals**		**2014**	**Confidence Intervals**		**Diff.**	
Predicted Probabilities								
Black	27.88%	27.45%	28.32%	10.23%	9.69%	10.76%	-17.66	***
Hispanic	16.13%	15.84%	16.42%	7.58%	7.20%	7.96%	-8.55	***
White	12.09%	11.87%	12.32%	4.78%	4.48%	5.08%	-7.31	***
Marginal Effects								
Black vs. White							-10.35	***
Hispanic vs. White							-1.2	***

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

GATEWAY COURSE ENROLLMENT

The likelihood of enrolling in gateway courses increased for all students across both subjects following the reform (Table 3). Specifically, the likelihood of enrolling in Intermediate Algebra increased by 20.80, 17.38, and 13.08 percentage points for Black, Hispanic, and White students, respectively. Again, these differences are all statistically significant, as are the marginal effects that examined differential rates of change. The rates of change in the likelihood of enrolling in Intermediate Algebra were 7.72 and 4.30 percentage points higher for Black and Hispanic students, respectively, compared with White students. English Composition 1 exhibited a similar trend. The likelihood of enrolling in English Composition 1 increased by 27.4, 17.6, and 12.98 percentage points for Black, Hispanic, and White students, respectively. The rates of change for Black and Hispanic students compared with White students were 14.42 and 4.62 percentage points higher, respectively.

Table 3. Gateway Course Enrollment Rates

	MAT 1033: Intermediate Algebra							
	2009–2013	**Confidence Intervals**		**2014**	**Confidence Intervals**		**Diff.**	
Predicted Probabilities								
Black	14.78%	14.44%	15.11%	35.58%	34.60%	36.56%	20.8	***
Hispanic	19.92%	19.61%	20.23%	37.30%	36.53%	38.07%	17.38	***
White	19.38%	19.11%	19.65%	32.46%	31.75%	33.17%	13.08	***
Marginal Effects								
Black vs. White							7.72	***
Hispanic vs. White							4.3	***
	ENC 1101: English Composition 1							
	2009–2013	**Confidence Intervals**		**2014**	**Confidence Intervals**		**Diff.**	
Predicted Probabilities								
Black	35.96%	35.50%	36.43%	63.37%	62.39%	64.34%	27.4	***
Hispanic	49.98%	49.58%	50.38%	67.58%	66.83%	68.33%	17.6	***
White	52.66%	52.31%	53.01%	65.64%	64.91%	66.38%	12.98	***
Marginal Effects								
Black vs. White							14.42	***
Hispanic vs. White							4.62	***

*$p < 0.05$. **$p < 0.01$. *** $p < 0.001$.

COURSE-BASED GATEWAY COURSE PASSING RATES

The likelihood of students enrolled in a gateway course to pass the course declined for all students in both subjects following the reform (Table 4). Specifically, the likelihood of students in the course to pass Intermediate Algebra decreased by 10.31, 9.15, and 8.58 percentage points for Black, Hispanic, and White students, respectively. This time, however, there was no evidence of racial/ethnic differences in the rate of decline of gateway course-based passing rates. ENC 1101: English Composition 1 exhibited a similar trend. Black, Hispanic, and White students were 5.01, 2.66, and 3.56 percentage points less likely, respectively, to pass English Composition 1. There were no significant differences in the rate of change between Hispanic and White students. However, compared with White students, the rate of decline for Black students was marginally significant and higher by 1.45 percentage points.

Table 4. Course-Based Gateway Course Passing Rates

	MAT 1033: Intermediate Algebra							
	2009–2013	**Confidence Intervals**		**2014**	**Confidence Intervals**		**Diff.**	
Predicted Probabilities								
Black	56.05%	54.84%	57.27%	45.74%	44.01%	47.47%	-10.31%	***
Hispanic	63.63%	62.82%	64.44%	54.47%	53.19%	55.76%	-9.15%	***
White	62.33%	61.59%	63.06%	53.74%	52.43%	55.06%	-8.58%	***
Marginal Effects								
Black vs. White							-1.73%	
Hispanic vs. White							-0.57%	
	ENC 1101: English Composition 1							
	2009–2013	**Confidence Intervals**		**2014**	**Confidence Intervals**		**Diff.**	
Predicted Probabilities								
Black	70.28%	69.55%	71.01%	65.27%	64.04%	66.51%	-5.01%	***
Hispanic	77.66%	77.21%	78.11%	75.00%	74.17%	75.83%	-2.66%	***
White	76.02%	75.62%	76.41%	72.46%	71.63%	73.29%	-3.56%	***
Marginal Effects								
Black vs. White							-1.45%	+
Hispanic vs. White							0.90%	

+p < 0.10. *p < 0.05. **p < 0.01. ***p < 0.001.

COHORT-BASED GATEWAY COURSE PASSING RATES

When examining the overall cohort, however, a different story emerges. Cohort-based gateway course passing rates *increased* for all students in both subjects, and the marginal effects suggest that the gains for Black and Hispanic students were greater than for White students (Table 5). Specifically, the likelihood of students in the cohort passing Intermediate Algebra increased by 6.81, 6.44, and 4.38 percentage points for Black, Hispanic, and White students, respectively. The marginal effects indicated that the gains were 2.43 and 2.06 percentage points higher for Black and Hispanic students, respectively, compared with White students. Further, it is essential to note that the postreform predicted probabilities of similarly prepared Black (14.46%) and White students (15.38%) fall within each other's confidence intervals and that the predicted probability for Hispanic students (18.00%) is higher than both. In other words, the postreform cohort-based passing rates for Intermediate Algebra are essentially the same for similarly prepared Black and White students and are *higher* for Hispanic students. Results are similar, though not as drastic, for ENC 1101: English Composition 1. Black, Hispanic, and White students in the cohort were more likely to pass English Composition 1 by 14.78, 11.02, and 6.66 percentage points, respectively. The rates of change in the likelihood of cohort-based passing rates were 8.12 and 4.36 percentage points higher for Black and Hispanic students, respectively, compared with that of White students.

Table 5. Cohort-Based Gateway Course Passing Rates

MAT 1033: Intermediate Algebra								
	2009–2013	Confidence Intervals		2014	Confidence Intervals		Diff	
Predicted Probabilities								
Black	7.64%	7.40%	7.89%	14.46%	13.76%	15.15%	6.81	***
Hispanic	11.56%	11.31%	11.80%	18.00%	17.41%	18.60%	6.44	***
White	11.00%	10.79%	11.21%	15.38%	14.85%	15.91%	4.38	***
Marginal Effects								
Black vs. White							2.43	***
Hispanic vs. White							2.06	***
ENC 1101: English Composition 1								
	2009–2013	Confidence Intervals		2014	Confidence Intervals		Diff	
Predicted Probabilities								
Black	24.24%	23.83%	24.65%	39.02%	38.00%	40.03%	14.78	***
Hispanic	37.43%	37.05%	37.82%	48.45%	47.64%	49.26%	11.02	***
White	38.29%	37.95%	38.63%	44.95%	44.17%	45.72%	6.66	***
Marginal Effects								
Black vs. White							8.12	***
Hispanic vs. White							4.36	***

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

DISCUSSION

In summarizing our results, three main themes emerge around enrollment and pass rates. First, now that students have the option to select out of enrolling in DE courses following the reform, the number of Black and Hispanic students enrolled in these courses decreased significantly compared with White students. Second, at the same time, Black and Hispanic students are enrolling in college credit gateway courses at higher rates compared with White students in both Intermediate Algebra and English Composition 1. Third, although course-based passing rates have declined, the cohort-based passing rates for Black and Hispanic students have increased at rates higher than those for White students, which provides some evidence that the achievement gap may be closing in Intermediate Algebra.

The cohort-based passing rates have two distinct advantages. First, they take into account the large increase in the percentage of Black and Hispanic students enrolling in gateway courses. Second, they do so in a way that balances this increase against any negative effect that Hispanic and Black students may have experienced from skipping developmental courses. Although some students who were academically underprepared were

not successful in the gateway courses, the overall effect of the policy was incredibly positive. The increases in the cohort-based passing rates, and the greater increases for Black and Hispanic students, imply that more students—and greater numbers of Black and Hispanic students—in each cohort passed the gateway courses following the implementation of SB1720.

Put differently, the gains in the total proportion of students passing gateway courses are higher for Hispanic and Black students than for White students. In fact, similarly prepared Hispanic students continue to outperform White students, and the Black–White achievement gap in gateway math appears to have closed. Thus, by eliminating the use of placement tests as the sole mechanism for course enrollment decisions, traditionally underrepresented racial/ethnic students in Florida are performing just as well—if not better—than similarly prepared White students when examining the total percentage of incoming students who successfully pass a gateway course in their first semester in a community college. These results align with findings from Wirt et al. (2004), who found that Black and White students had similar likelihoods of passing gateway courses. Our findings also support the claim that race alone does not explain the variance in the achievement levels of underrepresented racial/ethnic students (Bernal et al., 2000) and that, by eliminating barriers to enrolling in college-credit gateway courses as was done via Florida's DE reform, it is possible to close the racial achievement gap. However, we acknowledge that these findings are based on single-semester outcomes, and additional waves of data are needed to definitively state that the achievement gap in gateway courses has closed. Further, examining how the policy is related to other outcomes in which Black and Latino students traditionally underperform compared with White students, such as college persistence and degree completion, is important when considering the policy more broadly.

We would also be remiss if we did not discuss the finding that course-based passing rates have declined for all students. The English Composition 1 passing rate declined for Black students at a rate that was just marginally higher than that for White students ($p < 0.1$), and there were no significant differences in the rate of decline between Hispanic and White students in English or in Intermediate Algebra. In other words, for each student subgroup enrolled in the course, passing rates declined following the implementation of SB 1720, but these rates were similar for each race/ethnicity. If our models were perfect, we might expect to see an increase in course-based passing rates as well. Although we were able to include controls for race and gender, free and reduced lunch status (a proxy for socioeconomic status), and high school academic preparation, it is likely that some number of students are entering gateway courses who are underprepared in ways we cannot measure. For instance, generational status (a variable we do not have) may serve as an important measure

of preparedness. Future research on the role of generational status and other measures of ability, and their relationship with Florida's reform, is certainly warranted. These results have clear implications for policy. Even though closing the racial achievement gap, at least in terms of first-semester outcomes, was not an explicit goal of the legislation, it is encouraging to see that the gap has closed in the best possible way: Not only have *all* students experienced gains in cohort-based pass rates following the implementation of the legislation, but these gains have been the greatest for those students who had been the most underperforming. In other words, by reducing barriers to college-level courses, states have the opportunity to increase student achievement across the board, and particularly so for underachieving students. It is worth restating, however, that the Florida reform included both flexible placement and curricular changes. Thus, it is possible that state policy that eliminates DE altogether without any additional support mechanisms may do an extreme disservice to its students.

CONCLUSION

Although it is too early to discern the long-term impact of the Florida legislation, the findings from this article illuminate an important positive outcome that has policy implications far beyond Florida, and even beyond DE. Most directly, these findings suggest that by making DE optional, one positive outcome can be the reduction in, and indeed the elimination of, the racial/ethnic achievement gap in at least one measure of student success in college. More broadly, these findings suggest that eliminating barriers can have a strong positive impact—at least in the short term—on the success of Black and Hispanic students. Future research on the longer term outcomes of the Florida DE reform is desperately needed to better understand if this positive outcome observed in the first semester will persist into the years to come.

NOTE

1. We use the term *Hispanic* as a pan-ethnic term to represent all students who are from Hispanic/Latino backgrounds. We do this for consistency and because our data source uses this term, but we acknowledge that scholars continue to explore and debate the use of such terms (see Okamoto & Mora, 2015).

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