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An Event History Analysis of Educational Loans and College Graduation:

A Focus on Differences by Race and Ethnicity

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This study examines the association between educational loans and college graduation rates, with a focus on differences by race and ethnicity. Data come from the 1997 National Longitudinal Survey of Youth (NLSY97). Results from event history analyses that control for a number of student characteristics, college experiences, and financial resources indicate that educational loans are positively related to the rate of college graduation. Larger loan amounts tend to decrease the likelihood of college graduation. The relationship between educational loans and college graduation is stronger among minority (Black and Hispanic) students. Overall, there is little evidence that educational loans reduce racial and ethnic disparities in college graduation rates.

Key words: *educational loans, race/ethnicity, college graduation, event history analysis, National Longitudinal Survey of Youth*

The number of educational loans has grown rapidly in recent years as a way for financing college education. The growing reliance on student loans is evidenced by 39% increase in educational borrowing in the past decade (Payea, Baum, & Kurose, 2013) and the increase in the percentage of U.S. households reporting outstanding student debt, up from 6% in 1983 to 15% in 2007 (Dynan, 2009). Several factors have contributed to the increasing number of educational loans. College costs have risen sharply over the last decade, with a 42% increase at public universities and a 31% increase at private universities (National Center for Education Statistics, 2012). Many families' income and savings are insufficient to cover the escalating costs. Also, changing federal and state policies have shifted from need-based to merit-based aid and educational tax credits (Long & Riley, 2007; Woo & Choy, 2011). Federal and private loans also are becoming more accessible to students and their families (College Board, 2009; Heller, 2008). As a result, educational loans have become a common tool employed by many families to cover college costs.

However, the burden of educational loan is not evenly distributed among different income or racial and ethnic groups. Evidence suggests that minority students and students from lower income families are more likely to take out loans to pay college expenses (Alon, 2007; Elliott & Friedline, 2013; Long & Riley, 2007; Perna, 2000; Ratcliffe & McKernan, 2013). For example, a recent analysis of a national sample of adults age 20 years or older by Ratcliffe and McKernan (2013) indicates that Blacks (34%) and Hispanics (28%) are about twice as likely as Whites (16%) to have educational loans. In addition, low-income and minority students more likely to be burdened with heavy educational loan debt payments that exceed their monthly income (Baum & Steele, 2010; Price, 2004). As a result, they report having greater difficulties and concerns with repayment of student loans (Baum & O'Malley, 2003; Baum & Saunders, 1998; Ratcliffe & McKernan, 2013).

Among studies that examine the relationship between educational loans and college graduation rates (e.g., Alon, 2007; Dwyer, McCloud, & Hodson, 2012, 2013; Kim, 2007), there are few that systematically research this association among minority students. Given the soaring number and amount of educational loans and the marked racial and ethnic disparities in college graduation rates

(The college completion agenda, 2012), assessing educational loans' impact on racial and ethnic gaps in college completion rates. In this study, we investigate the following three research questions through event history analyses. Are educational loans associated with college graduation rates? Are educational loans associated with racial and ethnic gaps in college graduation rates? Does having educational loans affect White, Black, and Hispanic families differently?

This research contributes to research knowledge in several ways. First, while emerging research examines how educational loans are related to college enrollment rates and persistence in college (Heller, 2008; Elliott, 2013), we know little about how educational loan debt affects college graduation rates. Given the increasing importance of having a college degree for economic success (Bricker et al., 2012), we must pay more attention to how educational loans affect graduation rates. Second, this study contributes to the literature by investigating whether and how associations between educational loans and college graduation rates vary among different racial and ethnic groups. Such variations could be caused by differences in levels of parental economic resources (e.g., income and financial assets) and different returns on college education among various racial and ethnic families. This examination helps identify corresponding policies and practices in improving college graduation rates among minority students. Third, we conduct event history analyses to examine the proposed research questions. Existing studies tend to assess the impact of educational loans on college education using logistic regression analysis (Chen & Zerquera, 2011). The advantage of event history (i.e., survival) analysis is that it is able to handle censored data and takes time-to-degree into consideration, which is critical in this line of research.

Literature Review

Rationales

Two primary reasons for this study are to (a) examine the effects of educational loans on college graduation rates and (b) determine whether there is a differential impact of educational loans by race and ethnicity.

Effects of educational loans on college graduation rates

Educational loans, a type of unsecured debt, may have dual effects on how families finance a youth's college education (Gruber, 2001; Nam & Huang, 2009). On one hand, incurring such debt may increase the likelihood of graduation and will pay off in the future if the investment is rational. On the other hand, heavy debt could have diminishing or even negative effects on college graduation rates. For example, debt burden above 8% of monthly income is considered unmanageable (American Council on Education, 2004).

Educational loans could help increase the chances of enrollment in and graduation from college by removing financial constraints. Evidence shows that financial aid and loans can help reduce the number of hours that students work (Cabrera, Nora, & Castaneda, 1992), reducing their risks of (a) dropping out of college (Singell, 2004) and (b) delaying academic progress (Lam, 1999). Research also suggests that access to educational loans may reduce anxiety and stress during times of economic difficulty (Drentea, 2000), which might allow students to focus more on their studies. Access to educational loans also could improve self-esteem, mastery, and status attainment, especially among low- and middle-income students (Dwyer, McCloud, & Hodson, 2011). These attitudinal and emotional impacts may affect the likelihood of graduation. However, having an unmanageable debt burden may prevent youth and their families from saving, securing additional loans, and investing in the future. Large debt burdens also could harm physical and mental health

(Drentea, 2000; Drentea & Lavrakas, 2000; Jenkins et al., 2008). Therefore, having educational loans might result in students' financial stress, which may reduce their capacity for future planning and orientation. Drentea (2000) suggests that young people tend to experience more stress and anxiety from having heavy debt than their older counterparts. College students could incur large amounts of debt because of limited resources or inexperience in managing finances (Christie & Munro, 2003).

Differential impacts by race and ethnicity

Students from minority families face different financial circumstances than their nonminority counterparts, which may affect their perceptions of loans. For example, a qualitative study indicates that knowing whether additional resources are available to pay back debt affects youth's perceptions of the benefits and risks of debt (Christie & Munro, 2003). Educational loans may be the primary resource available to low-income students, while others may have additional funding sources (e.g., parents' income and wealth) to shelter them from the effects of debt. Thus, students from lower income families could be more sensitive to changes in tuition, financial aid, and educational loans (Dynarski, 2003; Heller, 1998; McPherson & Schapiro, 1998).

Given the striking racial and ethnic gaps in income and asset amounts (e.g., Bricker et al., 2012; Dynan, 2009; Kochhar, Fry, & Taylor, 2011), debt could have stronger positive and negative impacts on college graduation rates among minority students who are more likely to use educational loans as a primary source for their college education. Access to educational loans could improve college attendance by removing financial barriers, but minority students could be more likely to be stressed by heavier loan loads (Monks, 2001). They also may be more likely to understand the risks, perhaps because they recognize the financial challenges that their parents face in supporting them. Minority students also may be more likely to drop out of college when faced with higher loan amounts or declining academic performance (Cofer & Somers, 2000). Therefore, their assessment of the risks and benefits of obtaining a college degree could differ.

Empirical research

Studies of the relationships between student loans and college outcomes have focused on college enrollment and persistence. While study findings are mixed, a review by Heller (2008) suggests that educational loans have little or even a negative impact on college enrollment and persistence overall. Furthermore, it appears that the negative impact of loans in college persistence is more evident among low-income families (e.g., Paulsen and St. John, 2002; St. John, Andrieu, Oescher, & Starkey, 1994).

The limited research on educational loans and college completion rates similarly indicates inconsistent findings, which may be caused by differences in study samples, analysis models, and measures of loans and control variables. Overall, studies suggest that, while loans are positively related to college graduation rates, loans above $10,000 tend to have diminishing or negative impact on college graduation rates (e.g., Dwyer, McCloud, & Hodson, 2012, 2013; Zhan, 2012, 2013). Also, the impact of loans varies by student characteristics (e.g., income, assets, race and ethnicity, and gender) and institutional characteristics (e.g., public vs. private universities), which we will discuss below.

Evidence from these studies indicates that the impact of loans on college graduation differs based on family income and assets. For example, Kim (2007) analyzes a national survey and finds that the amount of educational loans in the first year of college has a negatively relationship with degree completion among low- and middle-income students, but its impact is not statistically significant for

high-income students. Similarly, a more recent study by Dwyer, McCloud, and Hodson (2012) finds that while educational loans of up to $10,000 increase students' chances of college graduation, loans above $10,000 have negative impacts on students from lower and middle-class families. Zhan's (2012) study shows that educational loans have stronger positive impacts on students from families with higher levels of net worth. However, Chen and DesJardin's (2008) event history analysis indicates that the impact of the first-year loan amount does not differ by income level.

Evidence also suggests that the effect of educational loans on college graduation rates varies by gender and institutional characteristics. According to Dwyer, McCloud, and Hodson (2013), the negative effect of loans is felt at a higher level for women (about $14,000) than for men (about $12,000), which indicates that women have more tolerance for heavy loan amounts. The authors' 2012 study suggests that educational loans have a stronger impact among students attending public universities than those at private universities.

Several studies examine the impact of loans on college graduation rates by race and ethnicity. Kim (2007) analyzes data from the Beginning Postsecondary Students (BPS) Longitudinal Study with hierarchical generalized linear modeling and finds that educational loans received in the first year of college have a slightly positive impact for White students but significant negative effects on Black students and negative impacts on Latino and Asian students. Analyzing data from Indiana's pubic four-year institutions, Gross and Torres (2010) report that educational loans have a more negative effect on Black students than White students, with a $1,000 increase in cumulative loan debt being related to decreasing odds of graduating for White (1%) and Black (1.4%) students. Alon (2007) finds that after controlling for financial aid eligibility, scholarships have a stronger positive effect on graduation for Black and Hispanic students than their White counterparts at elite colleges and universities, but educational loans have no impact.

Analyzing data from the National Longitudinal Survey of Youth 1979 (NLSY79-YA) cohort, Zhan (2013) finds that students with educational loans are more likely to graduate from college than those without loans, but minority borrowers with loans above $10,000 are less likely to graduate than those with loans between $5,000 and $10,000. According to our knowledge, this is the most systematic study of educational loans and college graduation rates by race and ethnicity through analyses of a recent national data set. However, the study has two major limitations. First, it conducts logistics regression, which does not take into consideration time-to-degree or censored data. Second, NLSY79-YA collected information on student loans only every two years. Building on Zhan's research, this study examines the impact of educational loans on college graduation rates by race and ethnicity by conducting event history analyses and analyzing a sample from the National Longitudinal Survey of Youth 1997 (NLSY97), which includes annual measures of educational loans.

Data and Methods

Data and sample

We used data from the NLSY97 to examine the proposed relationships between educational loans and graduation rates among racial and ethnic minority students. The NLSY97 consists of 6,748 respondents representative of the U.S. population born between 1980 to 1984 and a supplementary oversampling of 2,236 Hispanic and Black young adults born in the same years. The first round of the survey took place in 1997, and the latest round of data was collected in 2011 and 2012 and released in the summer of 2013. This study uses all 15 rounds of data available to date. NLSY97 is a good fit for this study because it contains rich information on college financing of a national representative cohort of young adults.

We selected a sample of 3,445 White, Black, and Hispanic respondents who reported having ever attended a four-year college or university for a degree by the time of the latest available data. The sample includes youth who graduated from college with a bachelor's degree, those who are attending college, and those who dropped out. Respondents who started college at two-year institutions and later enrolled in four-year colleges also were included. For the event history analyses, we deleted 165 cases with missing values on any of the variables (4.7% of the total sample), which leaves our analytical sample of 3,280.

Variables and measures

The dependent variable, referred to as the *event* in our analyses, is a dichotomous indicator of whether the respondent has graduated from a four-year college with a bachelor's degree. The predictor of interest is the total amount of educational loans owed when the respondent was last enrolled in college. The loan variable was top-coded at $40,000, the 99th percentile for the variable. For the convenience of interpretation, we used units of $1,000. Because of the expected nonlinear relationships between educational loans and graduation, as mentioned in the literature review, we included a quadratic term for educational loans in the analysis.

To adjust for potential confounders, we included measures of a student's sociodemographic and health information, academic ability, college experiences, and financial resources and needs in the analysis model. Demographic variables include the respondent's gender (male = 1, female = 0) and race and ethnicity (White, Black, and Hispanic, with White as the reference group) and whether the respondent was married or cohabited while enrolled in college (yes = 1, no = 0). We classified respondents as having a health limitation if they answered yes to any of the following questions (yes = 1, no = 0):

- Have you ever had a mental or emotional problem that limited regular activities?
- Have you ever had trouble seeing, hearing, or speaking?
- Have you ever had a part of your body that was deformed or missing?
- Have you ever been diagnosed with any other chronic health condition or life threatening disease?

We measured a respondent's academic ability by average GPA in the last year of high school (*mostly As, As and Bs,* and *below Bs,* with *below Bs* as the reference group). We measured a respondent's private or public college enrollment, full-time or part-time enrollment status, and working hours during enrollment. We included if the respondent had ever attended a four-year, private university at the time of the latest survey (yes = 1, no = 0) and whether a respondent had ever enrolled part time in a nonsummer term (yes = 1, no = 0). Working hours are measured as a dichotomous variable that indicates if a respondent had worked more than 20 hours per week on average while enrolled in college (yes = 1, no = 0).

To control for family financial background, we included parents' income in 1996 in the model. Because it is highly skewed, we recoded family income into three categories with the bottom, top, and two middle quartiles each representing a category. We also included a binary variable measuring whether parents had set up a prepaid college tuition account for a respondent as of 1996. We included two variables measuring respondents' financial needs, and calculated the ratio of terms in which respondents participated in the Federal Work Study (FWS) program to the total number of terms they were enrolled. We also calculated the ratio of terms in which respondents received grants, tuition or fee waiver or reductions, and fellowships or scholarships to the total number of terms enrolled.

Statistical analysis

We examined the relationship between educational loans and college completion using Cox proportional hazard regression model, one method of analyzing time-to-event data (Cox & Oakes, 1984). The failure event is college graduation, and we calculated survival from the time at the start of college enrollment. Survival is censored at the time of leaving the study if there were no interview for the respondent, the respondent had dropped out of college, or the respondent was enrolled in college. We applied Cox regression in this study because it considers time to graduation, copes different observation times, considers the censored data, and adjusts for potential confounders (Cox & Oakes, 1984). The effect estimate of Cox regression is a hazard ratio (HR). The hazard is the probability that the respondent will succumb to the event in the next instant if the respondent survives to time t. Interpretation of HR is similar to odds ratios in logistic regression. For a continuous covariate, the HR represents the incremental increase in hazard per unit increase in the covariate. For a categorical variable, the HR represents the incremental increase in hazard in one category relative to the reference category.

To examine how educational loans are related to racial and ethnic gaps in college graduation rates, we first fitted a Cox model with race and ethnicity as the main effect (Model 1) and then added the rest of the covariates with the exception of loan variables (Model 2). We then added the two loan variables (i.e., the amount of loans and a quadratic term of loans) to the analysis. After the final model was fitted, we performed separate analyses of the White, Black, and Hispanic samples to examine possible variations in the associations between educational loans and college graduation rates. We performed all analyses using SPSS 21.0.

Results

Descriptive analysis

Table 1 provides descriptive statistics for the study sample and each racial and ethnic group. The sample ($N = 3,445$) includes 2,163 White students, 758 Black students, and 524 Hispanic students. Their average age in 2013 was 31. About 22% of respondents reported that they had ever had health limitations, and about 32% were married or cohabited during college enrollment. In terms of academic ability, about 38% got mostly As in their last year of high school.

Regarding college experiences of the sample, nearly 30% had ever enrolled part time, about 33% had ever enrolled in a private university, and 35% worked an average of more than 20 hours per week during enrollment. As of 2013, only about 45% of the study sample held a bachelor's degree, and their average enrollment years was 4.4.

The average total parental income was about $46,000, and about 12% of parents had prepaid accounts for college tuition and other expenses. The percentages of the terms during which students received grants and scholarships and participated in the FWS program to the total number of terms during which they were enrolled is 53% and 8%, respectively. Nearly half (47%) of sampled students have educational loan debt, and among them, the average amount owed is approximately $5,200.

Table 1. Sample Characteristics

Variables	Full sample (N = 3,445)	White (n = 2,163)	Black (n = 758)	Hispanic (n = 524)
Student characteristics				
Age in 2013 (years)	31	31	31	31
Gender (% male)	46	47	39	48
% married or cohabited during enrollment	32	31	29	39
% ever had health limitations	22	22	23	19
Average grades in last year of high school				
% mostly As	38	46	22	31
% As and Bs	34	33	36	33
% Bs and below	28	21	42	3
College experiences				
Ever enrolled in a private university	33	33	33	30
Ever enrolled part time in a nonsummer term	28	25	31	37
% with more than 20 working hours per week during enrollment	35	33	36	42
Average number of years enrolled	4.4	4.3	4.4	4.6
% graduated with bachelor's degree	45	51	33	37
Financial resources and needs				
Average parental income in 1996 ($)	46,418	56,363	29,511	29,135
% with a prepaid college account	12	14	7	8
% terms during which students received grants/scholarships	53	48	69	53
% terms during which students participated in FWS	8	7	10	6
Educational loans				
% with loan debt	41	40	46	37
Average loan debt ($)	5,198	5,185	5,128	5,376

Note: Mean (median) is given for continuous variables. Unless otherwise specified, results are percentages.

Table 1 also shows differences in sample characteristics among the three racial and ethnic groups. The proportion of female students is lower among Black students than White or Hispanic students. Hispanic students were more likely than their White and Hispanic counterparts to have been married or cohabited during college enrollment, but they are less likely to report health limitations than White or Black students. White students had the best academic performance during their last year of high school, followed by Hispanic and Black students. Hispanic (42%) and Black (36%) students are more likely to have worked more than 20 hours per week than White students (33%), and higher percentages of Hispanic (37%) and Black (31%) students reported that they had enrolled part time in a nonsummer term than White students (25%). As of 2013, a higher proportion of White students held a bachelor's degree (45%) than their Black (33%) and Hispanic (37%) counterparts.

The family income of Black and Hispanic students (about $29,000) is much lower than that of White students (about $56,000), and Black (7%) and Hispanic (8%) students were less likely to have had prepaid college tuition accounts from their parents than White students (14%). Black students were the most likely to have received grants and scholarships and participated in the FWS program.

The groups also differ in their use of loans. Hispanic students are less likely to have taken out educational loans (37%) than their White (48%) and Black counterparts (44%). The average amount of educational loan debt is similar among the three groups (around $5,000).

To visually show the survival (i.e., nongraduating) rate by time to degree among the three racial and ethnic groups, we conducted a Kaplan-Meier survival curve (Figure 1). The survival curve shows that (a) the chances of graduating (i.e., the failure event) increase with time to degree and (b) minority students are less likely to graduate with the same enrollment time in college.

Figure 1: Kaplan-Meier Survival Plots
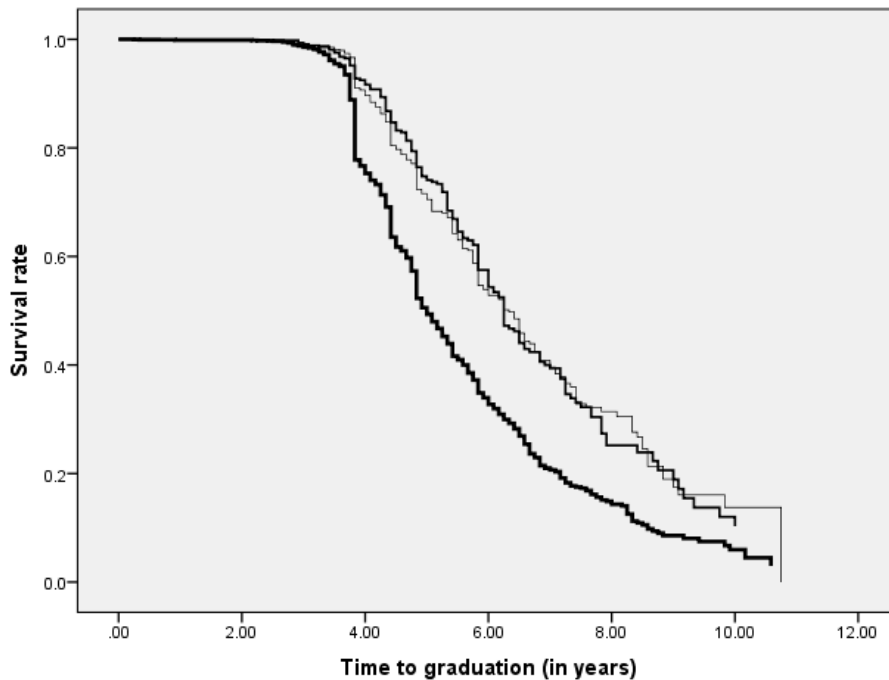
Note: The thickest line is for White students, followed by Latino and Black students (the thinnest and lightest line is for Latino students)

Event history analysis

Table 2 presents results from the event history analyses used to examine the associations between educational loans and college graduation rates. Results from Model 1, which controls for race and ethnicity only, suggest that students from Black and Hispanic families are less likely to graduate than their counterparts from White families. More specifically, White students are nearly twice as likely as Black and Hispanic students to graduate.

Including selected controls for students' characteristics, college experiences, and financial resources in Model 2 only slightly reduces the estimated gaps in college graduation rates across the three groups, and the differences remain statistically significant. Results from Model 2 indicate that being married or cohabiting and having health limitations during enrollment reduces the likelihood of graduation. Students with average letter grades of mostly As or As and Bs during their last year of high school are more likely to graduate than those with lower average grades (Bs or below).

Students who had ever enrolled in private university have a higher probability of graduating, but those who had ever enrolled part time and those who worked more than 20 hours per week on average are less likely to graduate. Of note, students from upper income families are more likely to graduate than those from middle-income families, but the chances of graduating are not statistically different between students from middle-income and low-income families. Having a prepaid college account set up by parents also increases the odds that a student will graduate. The higher number of terms during which students received grants and scholarships or participated in the FWS program also is related to higher graduation rates.

Table 2. Unstandardized Coefficients and Hazard Ratio from Event History Analysis: Models of College Graduation

Independent and control variables	Model 1		Model 2		Model 3	
	B	HR	B	HR	B	HR
Race and ethnicity (White)						
Black	-.592***	.553	-.588***	.556	-.564***	.569
Hispanic	-.600***	.549	-.477***	.621	-.469***	.652
Gender (Male)			-.092	.912	-.085	.919
Was married or cohabited during enrollment			-.384***	.681	-.385***	.680
Ever had health limitations			-.129***	.879	-.126***	.881
Average grades in last year of high school (Bs and below)						
Mostly As			.286***	1.378	.317***	1.373
As and Bs			.321***	1.378	.366***	1.442
Ever enrolled in a private college			.112*	1.119	0.079	1.082
Ever enrolled part time in a nonsummer term			-.568***	.567	-.541***	.582
More than 20 working hours per week during enrollment			-.200**	.819	-.229**	.795
Parental income in 1996 (Middle income)						
Lower income			-.078	.925	-.071	1.207
Higher income			.172**	1.188	.188**	1.207
Having prepaid college account			.215**	1.240	.234**	1.264
Ratio of terms during which students received grants/scholarships			.229**	1.258	.191*	1.211
Ratio of terms during which students participated in FWS			.353*	1.424	.294**	1.341
Educational loans					.063***	1.065
Educational loan squared					-.002***	.998

Note: B, unstandardized coefficient; HR, hazard ratio. Categories in parentheses are reference groups.
*p < .05, **p < .01, ***p < .001.

Model 3 adds educational loans and its quadric term to Model 2. Results suggest that the racial and ethnic disparities in college graduation rates remain almost the same as those in Model 2 and are statistically significant. The amount of loans is positively related to college graduation (B = .063, HR = 1.065), which suggests that having educational loans increases the probability of college graduation. More specifically, each $1,000 increase in loans is related to about a 6.5% increase in graduation rates. The quadratic term of loans is negatively related to the odds of college graduation

(B = -.002; HR = .998), which indicates that the positive effect of educational loans disappears and becomes a negative effect as loan amounts reach around \$15,750).

Differential links of student loans and college graduation by race and ethnicity

To further examine how educational loans influence college graduation rates by race and ethnicity, we estimated two interaction terms (Black × educational loan and Latino × educational loan, with White as the reference group). The two interactions terms are not significant with very similar coefficients (B = .022 and B = .020, respectively). We speculate that the much smaller sample size of the two minority groups (n = 758 for Black students and n = 524 for Hispanic students) than the sample of White students (n = 2,163) might contribute to this insignificant finding. Therefore, we combined the two minority groups and created a single interaction term (nonwhite × educational loan, with White as the reference group), and the interaction terms was significant (B = .021). The positive coefficient indicates that having educational loans has a stronger impact on minority students.

We also conducted separate analyses for each of the three racial and ethnic groups to investigate how educational loans and other factors may influence college graduation rates differently by race and ethnicity (Table 3). Results indicate that among White and Black students, the likelihood of graduating is higher for those with loans than those without loans (B = 0.051 for Whites and B = 0.089 for Blacks). The association is not statistically significant among Hispanic students, but its coefficient (B = 0.092) is very similar to that of Black students, which suggests that the smaller sample size might contribute to the insignificant estimation. These findings suggest that the positive impact of educational loans on graduation rates is stronger among minority students. More specifically, an increase of \$1,000 in loans is related to a 5.3% increase in graduation rates among White students but 9.4% among Black students and 9.6% among Hispanic students. The measure of quadratic term of loans is negatively related to the odds of college graduation among all three groups, and the negative impact seems to be slightly stronger among minority groups (B = -.002) than among White students (B = -.001).

Table 3. Unstandardized Coefficients and Hazard Ratio from Event History Analysis: Differences by Race/Ethnicity

Independent and control variables	White		Black		Hispanic	
	B	HR	B	HR	B	HR
Gender (Male)	-.080	.923	.105	1.111	-.489**	.613
Was married or cohabited during enrollment	-.425***	.654	-.278	.758	-.160	.852
Ever had health limitations	-.143	.867	.019	1.02	-.144	.866
Average grades in last year of high school (Bs and below)						
Mostly As	.374***	1.454	.007	1.007	.680**	1.975
As and Bs	.383***	1.467	.337	1.378	.533*	1.704
Ever enrolled in a private college	.042	1.043	.164	1.178	.160	1.173
Ever enrolled part time in a nonsummer term	-607***	.545	-.340*	.712	-.420*	.657
More than 20 working hours per week during enrollment	-.193**	.824	-.383*	.682	-.251	.778
Family income in 1996 (Middle income)						
Lower income	-0.13	.987	-.290	.749	.039	1.040
Higher income	.195**	1.215	-.027	.973	.329	1.389

	B	HR	B	HR	B	HR
Having prepaid college account	.200*	1.221	.394	1.453	.323	1.381
Ratio of terms during which students received grants/scholarships	.223*	1.250	.203	1.224	.011	1.011
Ratio of terms during which students participated in FWS	.266	1.305	.354	1.425	.148	1.159
Educational loans	.051***	1.053	.089*	1.094	.092**	1.096
Educational loan squared	-.001**	.999	-.002*	.998	-.002	.998

Note: *B,* unstandardized coefficient; *HR,* hazard ratio. Categories in parentheses are reference groups.
**p* < .05, ***p* < .01, ****p* < .001.

Interestingly, respondents who had ever enrolled part time are less likely to graduate from college among all three groups. Family income and having a prepaid college account are positively related to college graduation only among White students, which may be partly because minority families have much lower incomes and are much less likely to set up accounts for their children (Table 1). Somewhat surprisingly, the number of terms during which students received grants or scholarships was related to the graduation rate among Whites only, which is inconsistent with previous studies (e.g., Alon, 2007). Among other factors, having been married or cohabited during enrollment reduces the chances of college graduation among White students only, and having worked 20 hours or more per week reduces the odds of graduation among White and Black students. On the other hand, having better average grades in last year of high school increases the chances of college completion among White and Hispanic students. Because of the different sample sizes among the three groups, we must be cautious interpreting these findings. Additional research may help clarify the differential impacts of these factors on college graduation rates by race and ethnicity.

Discussion

This study examines three research questions. First, it investigates the relationship of educational loans with college graduation rates. After controlling for a range of students' characteristics, college experiences, and financial resources, we find that educational loans are positively related to college graduation rates to a point around $15,750. This is consistent with previous research that finds that educational loans may have conflicting impacts on college graduation rates, with heavier loans decreasing the likelihood of college graduation (e.g., Dwyer, McCloud, & Hodson, 2012; Kim, 2007; Zhan, 2012). However, this study finds that heavier loan loads may affect negatively White students' graduation rates also.

Second, this study explores whether educational loans are associated with racial and ethnic disparities in college graduation rates. As shown in Table 1, Black and Hispanic students have much lower graduation rates than White students. Results from event history analyses indicate that racial and ethnic gaps in college graduation rates remain constant and statistically significant after educational loans are added to the analysis model on college graduation. This suggests that educational loans do not help reduce racial and ethnic disparities in college degree attainment, despite minority students being more likely to rely on loans to finance their college education. In other words, educational loans do not serve as an equalizer in college success among different racial groups.

Third, the study examines whether the relationships of educational loans with college graduation rates differ by race and ethnicity. Separate analyses of subsamples for each racial and ethnic group reveal some differences in associations with college graduation rates. Estimates from models with controls for other factors suggest that (a) educational loans a similar conflicting impacts for Black

and Hispanic students and (b) the magnitude of positive and negative loan effects is stronger for minority students than for their White counterparts. This supports the assumption that minority students, who tend to have limited economic resources for college education, are more likely to be influenced by financial aid and loans (e.g., Dynarski, 2003 Heller, 1998). Reasonable loan amounts— up to $22,250 for Black students and up to $23,000 for Latino students, in this study—could help minority students complete their college education, but their tolerance of heavier loans might be lower than that of White students.

Among control variables, high school academic performance, having a prepaid college account, receiving grants or scholarships, and participating in the FWS program are all positively related to college graduation rates. Together these factors point to the importance of academic and financial preparation and resources for completing college. On the other hand, married or cohabiting students, those who have health limitations, those enrolled part time, and those with heavy working hours are less likely to graduate, which indicates that these students need additional help to complete college.

Conclusion

Limitations

A few limitations are worth mentioning and point to useful directions for future research. First, we cannot differentiate types of educational loans (e.g., federal, state, private; subsidized or unsubsidized), characteristics of which could impact college outcomes, in the NLSY97 data (Chen & Zerquera, 2011). Also, educational loans can be issued to parents and to students, but the data does not specifically denote whether loans were taken out by parents. Future studies could capture these differences.

Second, this study does not examine the possible mechanisms through which educational loans influence college graduation rates among different racial and ethnic groups, including financial, attitudinal, and cultural factors. Future research that takes these factors into account may clarify how loans affect college education and graduation rates. Such analyses also will help develop a new knowledge base, theoretical frameworks, and more effective policy and practice interventions.

Implications

A college degree carries great potential for improved economic status and social mobility (Bills, 2003; Carnevale et al., 2011). In a period of rising college costs, increasing educational loan debt, and marked racial and ethnic disparities in college graduation rates, it is critical to examine the risks and benefits of student loans. Consistent with previous research, the current study indicates that a large proportion of college students, especially minority students, rely on educational loans to pay for college costs. Although this study indicates that educational loans increase the probability of college graduation, it also suggests that higher loan amounts hurt college success and that having educational loans does not help reduce racial and ethnic disparities in college graduation rates. Addressing students' financial needs with additional educational loans and other types of credit may be counterproductive and even magnify racial and ethnic disparities. Furthermore, evidence suggests that high amounts of educational loan debt may negatively affect long-term career development and financial well-being, especially among borrowers with limited economic resources (Elliott, 2013; Heller, 2008).

Creating and implementing alternative strategies for addressing the financial needs of college students, especially those of minority students with limited incomes and financial assets (Long & Riley, 2007), is essential for racial and ethnic equality in higher education. Findings from this study indicate that in addition to providing grants and scholarships, prepaid college savings accounts set up by parents may be an effective strategy for enhancing college access and graduation rates. Consistent with findings from emerging research that examines the effects of household assets and youth savings on college education, this study indicates that having a prepaid college savings account setup by parents is a strong predictor of college graduation. Perhaps more importantly, studies suggest that asset accumulation has long-term benefits that extend beyond education and economic outcomes (Elliott, Destin, & Friedline, 2011). Fostering asset accumulation may be an effective strategy for improving college graduation rates and the long-term development of college students.

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