

Helping or Hindering? The Effects of Loans on Community College Student Persistence

Lyle McKinney, Ph.D.
Assistant Professor of Higher Education
Department of Educational Psychology
427 Farish Hall
University of Houston
Houston, TX 77204-5019
Phone: 713-743-1784
Fax: 713-743-4996
E-mail: lmckinney@uh.edu

Andrea Backscheider Burridge, Ph.D.
Clinical Professor of Educational Psychology
Department of Educational Psychology
491 Farish Hall
University of Houston
Houston, TX 77204-5019
Phone: 713-743-4996
Email: aburridge@central.uh.edu

Abstract

More community college students are taking out loans than ever before and their median debt levels are increasing. This trend is disconcerting because community college borrowers are overrepresented among loan defaulters and those who dropout without having earned a degree. While not without criticism, a growing number of community colleges are choosing not to participate in federal student loan program, citing a desire to protect their students from future financial hardships. This study used data from the Beginning Postsecondary Student (BPS:04/09) survey and propensity score matching techniques to examine the effects of loans on persistence for students enrolled in associate's degree programs. Results indicated that borrowing during the first year had a positive effect on persistence at the end of year one, but had a negative effect on persistence measured three and six years after initial enrollment. As community college students assess their prospects for degree completion and the return on their financial investment in higher education, borrowers are more likely to become dissatisfied with their investment decision than non-borrowers and choose to dropout rather than take on additional loan debt. Findings from this study suggest the need to carefully reconsider current policies and practices regarding loan use among community college students.

KEYWORDS: community colleges; student loans; student persistence; federal loans; propensity score matching

Introduction

Our nation's community colleges have a longstanding reputation as affordable, open-access institutions that provide access to higher education for millions of lower-income and racial/ethnic minority students each year (Meier, 2013). For most of these individuals, "the choice is not between the community college and a senior residential institution; it is between the community college and nothing" (Cohen & Brawer, 2008, p. 58). The average tuition and fees charged by community colleges is approximately one-third of that charged by public four-year institutions (Baum, Little, & Payea, 2011), but a growing number of community college students are still unable to afford the total costs of attendance without taking out loans. Steele and Baum (2009) found that 38% of community college students who earned their associate's degree during the 2007-08 academic year had acquired federal and/or private student loan debt. Their analyses also show that between 2003-04 and 2007-08, median debt levels increased for students earning associate's degrees (up 14% to \$7,125). Perhaps this growing reliance on loans should not be a surprise given that, "forty percent of community college students have such low incomes that they have no resources to pay for a college education" (Institute for College Access & Success, 2009, p. 1).

But loan utilization among community college students is a contentious issue and there remains considerable debate as to whether these students should even have access to loans (see Project on Student Debt, 2011). Approximately 1 million community college students, or 9% nationwide, are without access to federal loans because their institution has elected not to participate in the federal loan programs (Project on Student Debt, 2011). Community colleges that do not make federal loans available to their students cite a desire to protect students from future financial hardships. Perhaps these concerns are justified given community college students who borrow are at greater risk of dropping out before earning their degree (Education Sector,

2012; Gladieux & Perna, 2005) and defaulting (Dynarski, 1994; Field & Brainard, 2010) than borrowers attending public four-year institutions.

While the rationale for not participating in the federal loan programs may be well-intentioned, denying students access to loans can have unintended consequences. Without access to a federal loan, students may be forced to attend college part-time or work more than 20 hours per week to afford their college-related expenses (Project on Student Debt, 2009). Research suggests that these behaviors can adversely affect persistence among community college students (Horn & Berktold, 1998; King, 2002; McKinney & Novak, 2013). Some students who are denied access to federal loans may turn to private loans or credit cards to pay for college, which are riskier and often carry significantly higher interest rates than federal student loans. The Project on Student Debt (2009) states that even a modest federal loan “can make it possible for a student to limit work hours, pay for child care, attend school full-time, or otherwise free up time needed for classes and studying” (pg. 2).

Several reports by the Project on Student Debt (2008, 2009, 2011) have criticized the community colleges that elect not to make federal loans available to their students, suggesting this policy approach ‘shortchanges’ students and reduces their chances for degree attainment. In response, the American Association of Community Colleges (2008) issued a formal statement in support of institutional choice claiming that community colleges are structured in a way that makes borrowing a last resort, and largely unnecessary, for most students.

So which approach is best? Do loans help, or hinder, community college students’ chances of remaining enrolled and earning a postsecondary credential? If loans help facilitate degree attainment, then borrowing would represent a wise investment for many community college students because of the higher labor market returns associated with earning a certificate

or associate's degree (Baum, Ma, & Payea, 2010). Conversely, if borrowers are more likely to dropout than non-borrowers, then colleges who deny their students access to federal loans may actually be aiding their students' chances for success. Unfortunately, existing research provides no definitive conclusions on this issue that could help inform current policy or practice. These inconclusive and mixed findings from the literature are troublesome in light of recent events (e.g. economic downturn, rising college costs, reductions to state grant aid programs, modifications to Pell Grant eligibility) that are likely to further increase the use of loans among community college students in the future.

The purpose of this study was to establish a better understanding of how loans impact persistence among community college students. Findings from this study are intended to inform current policy discussions and institutional practices regarding the utility of borrowing among this student population, which could directly benefit national efforts aimed at increasing community college completion rates. The research questions guiding this study were:

1. What are the characteristics of associate's degree-seeking community college students who take out federal loans during their first year of enrollment? Proportionally, are there differences between borrowers and non-borrowers?
2. After controlling for self-selection bias, are there significant differences in dropout rates among community college students who do, and do not, take out federal student loans?

Literature Review

The majority of existing research examining the effects of financial aid, including loans, on college student persistence and degree attainment has focused on students attending four-year postsecondary institutions. In general, researchers have given far less attention to how financial aid impacts community college students (Dowd & Coury, 2006; Long, 2007). The limited number of studies that have empirically investigated the effects of loans on persistence among community college students generate more questions than answers. This literature review

provides an overview of prior research on this topic and includes only those empirical studies in which the sample was limited to community college students. This section concludes by identifying current gaps in the literature and the contributions of the present study.

St. John and colleagues conducted two studies in the 1990s that examined the relationship between tuition, financial aid, and first-year community college student persistence. Both of these studies analyzed data from the National Postsecondary Student Aid Study (NPSAS:86). In the first study (St. John & Starkey, 1994), the sample was restricted to traditional-aged community college students, defined as below 23 years of age. Logistic regression was used to examine the relationship between financial aid and within-year persistence (i.e. Fall to Spring semester) while controlling for other relevant background characteristics. Loan debt level was entered into the model as a continuous measure. While tuition increases and higher levels of grant aid had a negative effect on persistence, the researchers found that loans had no significant effect on persistence for the community college students in their sample.

In a similar study (Hippensteel, St. John, & Starkey, 1996), researchers examined NPSAS:86 data to determine how financial aid impacted within-year persistence among non-traditional-aged community college students, defined as 23 years of age or older. Logistic regression models were employed, and loans were entered into the model as a dichotomous (borrowed or not) and continuous (debt level) measure. The results indicated that taking out a loan significantly reduced the likelihood of persistence, but the negative effect of loans was no longer present when tuition was added to the regression model. The authors suggest that the availability of financial aid during the time period under investigation was not sufficient enough to significantly promote persistence, and high levels of unmet financial need can explain the negative associations between aid receipt and persistence.

Analyzing data from NPSAS:96, Cofer and Somers (2000) also investigated within-year persistence among community college students. The researchers employed logistic regression and included measures for student background characteristics, college experiences, tuition, and financial aid. With regards to the effects of loans on persistence, this study reached different conclusions to the findings from St. John and colleagues. Results indicated that students were 7.75% more likely to persist for each \$1,000 of loan debt outstanding. In terms of students' debt load, Cofer and Somers (2000) found that, "students with a low debt level (under \$3,000) were 4.85% less likely to persist than students with no debt. Students with high debt (over \$7,000) were 15.96% more likely to persist than students with no debt" (p. 797). The authors concluded that community college students who are highly motivated to graduate will assume larger amounts of debt in order to achieve this goal, while less motivated students will be reluctant to assume additional debt and therefore dropout.

In a second study, Cofer and Somers (2001) analyzed data from both NPSAS:96 and NPSAS:93 to examine how debt levels and other factors impact within-year persistence of community college students. The rationale for using both NPSAS datasets was to examine any potential differences in the effect of debt levels after the reauthorization of the Higher Education Act (HEA) of 1992, which increased the maximum amount students could borrow annually. Logistic regression analysis of the NPSAS:93 data revealed that students were "2.5 percentage points more likely to persist for every \$1000 of student loans received in the current year. Only one of the three levels of debt was negatively associated with persistence. Students with a high debt level (greater than \$7,000) were 8.3 percentage points less likely to persist than those students with no debt" (p. 69). When the same model was applied using NPSAS:96 data, the results indicated that students were, "8.0 percentage points more likely to persist for every \$1000

of student loans. Students with a low debt level (less than \$3000) were 5.1 percentage points less likely to persist than those with no debt. However, students with high debt (over \$7000) were 16.4 % more likely to persist than those students without accumulated debt” (p. 69). The authors suggest these seemingly contradictory findings could be attributed to the bimodal distribution of persisters. That is, full-time dependent students who are nearing completion may be willing to borrow more in order to reach their goals, while even a small amount of debt may deter students who are debt-averse from reenrolling. Another explanation for the results was that the increased availability of loans from 1993 to 1996 (largely through establishment of the unsubsidized loan program as part of the HEA of 1992) helped more community college students persist.

Fewer studies have examined how loans impact persistence beyond the first year of enrollment for community college students. A notable exception is a study by Dowd and Coury (2006) that analyzed data from the Beginning Postsecondary Students study (BPS:90/94) to estimate the effects of loans on persistence to the second year and associate’s degree attainment within five years of initial enrollment. This study represents an important contribution to the literature because the analyses and discussion focus explicitly on the relationship between loans (rather than financial aid in general) and community college persistence. The researchers employed a series of logistic regression models and loans were entered into the model in several different forms (e.g. borrowed yes or no, ratio of total aid received, level of debt). Overall, the results indicated that after controlling for key background and status variables, loans had a negative effect on persistence to the second year and no effect on associate’s degree attainment during the time period under investigation. Based on the results from their analyses and in recognition of the mixed findings on this topic from prior research, the authors emphasize the

need for more research before loans are considered an appropriate financing strategy for students attending community colleges.

One study utilized a longitudinal, state-level dataset containing student records from 2002-2006 to examine how different types of financial aid impacted persistence among community college students in Oklahoma (Mendoza, Mendez, & Malcolm, 2009). The selected sample was comprised of students who were enrolled full-time and pursuing an associate's degree. The outcome of interest was persistence to the second academic year or having reached second year status, which was defined as having successfully completed 30 credit hours. A limitation of the dataset was that it only included the type of financial aid (i.e. Pell Grants, federal loans, state grants), but not the dollar amounts of aid from these sources. Also absent from the dataset were other potentially relevant predictors of student persistence, such as pre-college academic performance and measures of student engagement. The researchers employed logistic regression similar to prior studies, but a notable contribution of this research was the use of a fixed effects model that aimed to assuage selection bias. The results indicated that federal loans, alone and in combination with grant aid, positively impacted persistence for community college students in Oklahoma.

In sum, a review of prior research on the effects of loans on community college student persistence reveals, "the empirical literature does not present consistent results, and more work is clearly needed in this area" (Dowd & Coury, 2006, p.57). This statement still holds true today. Relatively few empirical studies have examined the relationship between financial aid and persistence among community college students, and ever fewer have focused explicitly on the relationship between loans, debt levels, and enrollment behaviors among this student population. Today millions of community college students across the country have ready access to federal

loans, but it remains unclear whether borrowing facilitates, or impedes, their ability to remain enrolled and achieve their educational goals. More research is needed to help policymakers and college leaders better understand this issue, which has implications for reaching the goal set by the American Association of Community Colleges to increase the completion rates of students earning community college credentials by 50% by 2020 (AACC, 2012).

The present study aimed to address several limitations in the extant literature. First, prior studies using nationally representative datasets have failed to explicitly control for the self-selection bias associated with which community college students choose to take out loans. In recent years, self-selection bias has been identified as a major statistical problem plaguing many financial aid studies because it can undermine the precision of estimates and even the magnitude and direction of effects (Alon, 2005; Cellini, 2008; Chen, 2008; Dowd, 2008). The lack of reliable findings among existing studies has led to criticism of the collective body of research estimating the causal effects of financial aid on student outcomes (Cellini, 2008; Dowd, 2008). For that reason, the current study utilized propensity score matching in an attempt to control for self-selection bias and generate more precise estimates of the effects of loans.

Second, the most recent empirical investigation of this issue that used a nationally-representative dataset (i.e. Dowd & Coury, 2006) was conducted using BPS data collected in the early 1990s. Since that time period, the rates of borrowing among community college students, and the maximum amount students can borrow annually, has increased significantly. There is a pressing need to update research on this topic as more community college students are turning to loans to finance higher education. The present study used the Beginning Postsecondary Student dataset (i.e. BPS:04/09) to offer more recent findings that can be used to guide current policy and institutional practice regarding the utilization of loans by community college students.

Conceptual Framework

The present study applied an integrated conceptual model proposed by Chen (2008) for examining the effects of financial aid on college student persistence and dropout. Chen's model, referred to as a heterogeneous research approach, incorporates perspectives from five major and well-researched theories (i.e. psychological, sociological, organizational, interactionist, economic) used in studying persistence. Based upon a critical review of existing literature on student persistence, Chen proposes eight clusters of independent variables to be considered: student background, educational aspiration, pre-college preparation, financial factors, college experience, institutional characteristics, interaction effects, and time in college. These clusters were used in the present study as a guide in selecting the variables included in the calculation of propensity scores and in the outcome models.

An important contribution of Chen's framework is the explicit focus on the complex relationship between financial aid and student persistence. While existing theories of college student persistence have recognized the role of financial aid (e.g. Bean, 1980; Bean & Metzner, 1985; Spady, 1970; Tinto, 1975), Chen's model offers a more nuanced understanding of how different types (i.e. grants, loans, work-study) and amounts of financial aid can potentially impact persistence among different student groups. Commenting on the existing persistence literature, Chen states that, "...most studies on student dropout from higher education tend to assume that financial aid exerts a uniform effect on students, ignoring the fact that the student body is heterogeneous and may respond differently according to income and racial/ethnic background" (p. 233). Given the notable heterogeneity among community college students, assuming a uniform effect of financial aid for this student population may be particularly problematic.

Referencing Heller's (1997) discussion of price-demand, Chen applies the economic concepts of liquidity constraints, price elasticity, and debt aversion to explain differential effects of financial aid across student groups. A liquidity constraint exists when the amount a student can borrow is limited, which is the case for federal student loans. Lower-income students are often forced to borrow higher amounts to attend college than their more affluent peers, so this liquidity constraint may result in a shortage of financial resources and increase their likelihood of dropout. Price elasticity refers to the degree of sensitivity to changes in price, which is often influenced by the portion of income required to purchase the product (Chen, 2008). Studies have found that community college students are more sensitive to net tuition changes through financial aid than students in the four-year sector (Heller, 1997; Leslie & Brinkman, 1987). Debt aversion refers to a reluctance to acquire financial debt. Prior studies have found that students' willingness to borrow and tolerance for debt can be influenced by their socioeconomic status and race/ethnicity (Cunningham & Santiago, 2008; Dowd, 2008), with Hispanic and Asian students typically being identified as the most debt averse. According to Chen, these economic concepts underscore the importance of examining financial aid effects as a function of students' income status and race/ethnicity.

In addition to proposing the conceptual model, Chen provides recommendations for how to apply the model during data analysis. Longitudinal, rather than cross-sectional, datasets are recommended because of the temporal nature of student dropout. While logistic regression is a suitable technique, Chen suggests that researchers use statistical methods specifically intended for use with longitudinal and time-varying data when possible, such as event history modeling (see DesJardins, 2003). Model specification must take into consideration multicollinearity, self-selection bias, and for those analyzing National Center for Education Statistics (NCES) datasets,

complex survey design characteristics. The use of interaction terms is recommended to detect any differential effects of financial aid as a function of students' income status, race/ethnicity, and time in college. Prior research that indicates a relationship between the effects of loans and students' income status and race/ethnicity (Kim, 2007) suggest the use of interaction terms is appropriate for the diverse population community college students examined in the present study.

Methodology

Data Source and Sample

The data used in this study were derived from the Beginning Postsecondary Student Study (BPS:04/09) conducted by the National Center for Education Statistics. This iteration of BPS surveyed a cohort of first-time college students who began their postsecondary careers in 2003-04 and it followed their educational experiences through the 2008-09 academic year. The sample used in the present study consisted of students who began at a public two-year institution (i.e. community college) during Fall 2003 and were enrolled in an associate's degree program (unweighted $n = 4,530$)¹.

Students who began their postsecondary careers enrolled in a certificate program were not included in the sample, as their borrowing behaviors may systematically differ from students pursuing an associate's degree or intending to transfer to a four-year institution. International students were removed from the sample because in most cases they are ineligible for federal financial aid, including federal student loans. In addition, only White, African American, and Hispanic students were included in the propensity score calculations and outcome models, as there were too few cases of borrowers in any other racial/ethnic group for the purposes of

¹ All unweighted n 's in this study are rounded to the nearest ten per NCES data security guidelines.

statistical analysis. When the BPS survey weights were applied, the sample represented over 1.2 million community college students.

Our investigation of the effects of federal loans is limited to funds borrowed from the federal Stafford and/or Perkins Loan programs. The federal PLUS Loan program allows parents of dependent undergraduates to take out additional loans for their child, but relatively few community college students use this type of federal aid. Moreover, a student's assessment of the costs and benefits of using loans may differ if they anticipate their parents will repay this debt, so PLUS loans were not examined in this study. Approximately 37.4% of the students in the sample (including those who transferred to a four-year college) had taken out a federal Stafford and/or Perkins loan within the six year time period under investigation.

Variables

Independent variables were selected using extant literature on student loans and Chen's proposed conceptual model. We selected two classes of independent variables: 1) those used in propensity score modeling to match students who had chosen to receive federal loans in their first year with those who had not received this type of financial aid (see below for a description of propensity score models), and 2) variables to include in the outcome models examining the impact of federal loans on institutional departure. Independent variables included in propensity score modeling were variables that were expected to predict a student's decision to take out a loan. These variables are typically factors that would be present at the time the decision is made. A smaller set of key independent variables were included in the outcome models. These included race/ethnicity, attendance pattern, Pell Grant status, first-year GPA, and loan variables.

The outcome variable of interest was institutional departure, or dropout, measured at three time points: the conclusion of academic years one (2003-04), three (2005-2006), and six

(2008-2009). The outcome variable was coded dichotomously: 0 = earned associate's degree or certificate; transferred from the community college; no degree but still enrolled, and; 1 = dropped out without having earned a postsecondary credential (i.e. not enrolled at a particular time point, which does not preclude a student from reenrolling in a subsequent year). This coding reflected our intention to estimate the effects of loans on institutional departure versus all other outcomes that could be considered success for community college students.

Propensity Score Matching

The analysis first relied on propensity score matching (PSM) to adjust for selection bias (Rosenbaum & Rubin, 1983). In observational studies, because of the lack of randomization, imbalances in observed and unobserved variables can occur, which result in bias when researchers study group differences (Rubin, 1997). In PSM, a probability (i.e. propensity) is generated for each case that represents an individual's propensity to undergo a treatment, given their background characteristics. Thus, the propensity score can be represented as the probability of treatment (i.e. borrowing a student loan) given a vector of observed variables:

$$p(x) = \Pr[T=1|X=x]$$

where Pr is the probability of experiencing an outcome, T is the treatment, and X is a vector of characteristics. These propensity scores can then be utilized analytically to create groups of subjects who are as similar as possible on observed variables, potentially eliminating bias in comparing treatment groups using observational data (Mittra, Schnabel, Neuget, & Heitjan, 2001; Rubin, 1997).

The PSM techniques in this study followed these steps: 1) selection of covariates based upon Chen's conceptual model and extant literature on borrowing. Because the goal of PSM is to create equivalent groups, not parsimony, variables hypothesized to be related to borrowing, with

the exception of variables affected by participation (see Malcom & Dowd, 2012), were included. See Appendix 1 for additional information about the variables used for the propensity scores; 2) logistic regression to calculate propensity scores; 3) matching of participants using nearest neighbor matching on the logit using a caliper based on .2 of the standard error (Austin, 2011); and 4) modeling of student dropout using the matched samples.

Background covariates to be entered in the propensity scores were first evaluated for differences between students who borrowed during their first year and those who did not. Significant differences were present for most covariates (see Appendix A). Regardless, all relevant covariates were retained in the propensity score model as they were theoretically relevant (see Malcolm & Dowd, 2012). As the purpose of propensity score estimation is to balance the observed distribution of covariates and patterns of missingness, not to estimate regression parameters or draw inferences about those parameters, indicators for missingness were used in estimating propensity scores (D'Agostino & Rubin, 2000). After generating propensity scores for each student using logistic regression, the distributions were examined to identify the region of common support (see Appendix B). The Stata modules *psmatch2* and *ptest* were used to create a matched sample on the region of common support (Leuven & Sianesi, 2003).

Results from PSM revealed that over 99% of the cases were successfully matched: only four observations could not be matched because they were outside the region of common support (.5%, see Appendix B). Following Sianesi (2004), pseudo-R² statistics were calculated to compare the joint significance of the predictors before and after matching. On the raw sample, pseudo-R² = .098, LR χ^2 = 378.36, $p < .001$, and the median bias was 10.5%. After matching,

pseudo- $R^2 = .098$, LR $\chi^2 = 12.53$, $p = .997$, and the median bias = 2.4%. See Appendix A for balance by key predictor variables before and after PSM.

Logistic Regression

Logistic regression models were used because the outcome variable was dichotomous. Similar to prior research that has applied Chen's conceptual model (see Mendoza, Mendez, & Malcolm, 2009), time in college was captured as a dependent, rather than independent, variable in our study. For the year three and year six regression models, the cumulative level of federal debt as of year three was added as a predictor variable. Three sets of interaction terms were considered as additions to each regression model: loan status x race/ethnicity, loan status x income (i.e. Pell Grant) status, and loan status x attendance pattern.

As recommended with all complex and/or multi-stage cluster sample datasets, weights and design effects were used to account for the oversampling of certain groups and clusters of homogeneity within sampling levels (Thomas & Heck, 2001) but were not used in calculating propensity scores (Hahs-Vaugh & Onwuegbuzie, 2006; Zanutto, 2006). Since BPS:04/09 was the dataset used in this study, the recommended best practices for analyzing NCES datasets were employed (Hahs-Vaughn, 2006) and the data were analyzed using Stata 12.

Limitations

There are several limitations to this study that warrant attention. Dowd (2008) has noted that most of the postsecondary datasets available through NCES do not contain psychological measures that can impact students' borrowing behavior. Internal qualities such as self-efficacy and locus of control may influence a borrower's views about their ability to complete their degree and successfully repay their loans. These measures are unavailable in BPS:04/09 and therefore could not be analyzed in the present study.

Several of the independent variables included in the regression models were measured during the student's first year of enrollment at the community college. This is not uncommon in persistence studies analyzing BPS data. However, this is important to acknowledge because these variables (i.e. attendance intensity, cumulative GPA) may have changed in subsequent years and exerted an influence on a student's enrollment behavior. The temporal nature of these types of measures is one of the primary reasons why researchers have advocated for the use of event history techniques to examine student persistence and dropout (Chen, 2008; Desjardins, 2003).

The effects of loans and debt levels discussed in this study refer only to federal student loans (i.e. Stafford and Perkins loans). BPS:04/09 does contain a variable indicating whether the student had ever taken out a non-federal (i.e. private) student loan, but the overwhelming majority of students in our sample did not provide a response to this item. Therefore, we did not include private loans in our study because of the large number of missing cases. Among full-time community college students who applied for financial aid in 2007-08, approximately 8% took out a private loan and 37% of these private loan borrowers did so without first taking out a federal loan (TICAS, 2009). Therefore, the results from this study may underestimate the rates of borrowing, and cumulative loan debt burden, among community college students.

Results

Descriptive statistics

Table 1 provides descriptive statistics for the sample. With regard to background characteristics, a higher proportion of the sample was female (57.3%), White (66.7%), age 24 or younger (77.1%), and came from households that were in the two lowest income quartiles (58.4%). A considerable proportion of the sample (44.1%) had delayed enrollment into college from high school by one year or more. The largest proportion of students in the sample was

enrolled exclusively full-time (47.6%) during their first academic year, while 36.4% enrolled exclusively part-time and 16% enrolled both full-time and part-time.

Table 1 also describes the characteristics of community college students who took out a federal loan during their first academic year. A higher proportion of first-year borrowers were female (64.5%) and White (74%). African American students represented 20.2% of all borrowers in the sample, while only 5.7% of Hispanic students in the sample took out a federal loan in their first year. A higher proportion of students from the two lowest income groups borrowed (64.9%) compared to students from the two highest income groups (35.1%). The use of federal loans was most prevalent among students who enrolled full-time (64.5%), followed by those who attended part-time (22.0%) and a mix of full- and part-time (13.5%).

With regards to persistence and attainment status across the three time points of interest, proportionally the full sample and those who borrowed had relatively similar outcomes. About 8.7% of borrowers had already dropped out by the end of the first year. Across the sample of borrowers, 14.6% had earned an associate's degree or certificate six years after initial enrollment while 34.2% had dropped out by this time point. A comparison of outcomes across all three time points years of interest revealed that, compared to the full sample, a slightly smaller proportion of borrowers had dropped out and a higher proportion of borrowers had transferred at each of the three time points. A smaller proportion of borrowers were still enrolled at the community college without having earned a degree or transferred compared to the proportions of the full sample.

Approximately one third of the students in our sample (37.4%) had taken out a federal loan within the six years under investigation in this study. Table 2 provides descriptives for federal loan debt levels among borrowers in the sample as a function of their enrollment status at the two later time points of interest. Three years after initial enrollment, the median debt level for

students who had earned their associate's degree (or a certificate) was approximately \$5,500, compared to about \$3,000 for students who had dropped out. The sample examined at the six year time point (2008-09) was limited to students who had not already attained a postsecondary credential or dropped out as of year three (2005-06). The median debt level for borrowers who had dropped out by 2008-09 was approximately \$5,900, compared to about \$9,600 for those who had earned a credential from the community college. The higher median debt levels for students who had transferred from the community college (\$12,250) includes any federal loans taken while attending the transfer-receiving institution, which was a four-year institution in many cases. Students who were still enrolled at the community college six years after enrollment and had not transferred or earned an associate's degree or certificate had a median debt level of \$7,500.

The Effects of Loans on Institutional Departure

For each of the regression models discussed (see Table 3), the reference or comparison group for the outcome variable was having attained a degree or certificate, having transferred, or still being enrolled. The first logistic model examined students' enrollment status at the conclusion of their first academic year (i.e. 2003-04), controlling for race/ethnicity, attendance pattern, first year GPA, and Pell Grant status. There was a significant positive effect of taking out a federal student loan (OR = .48, $t(1)=2.75$, $p=.006$) on enrollment status at the end of year one. Non-borrowers had approximately twice the odds of having dropped out (OR = 2.09) versus students who had taken out federal loans. As expected, there was a significant effect of first year cumulative GPA, with an odds ratio of .96 ($t(1)=2.11$, $p=.035$), indicating a .10 decrease in GPA results in 1.04 times higher odds of dropping out. There was also a significant effect of attendance intensity in the first-year, with the odds ratio of dropping out of 1.90 for part-time versus full-time students ($t(1)=2.00$, $p=.046$), and .38 for students who mixed part- and full-time

enrollment versus students who attended exclusively full-time during their first academic year ($t(1)=2.18, p=.030$). Considered as a sets of indicator variables, student's race/ethnicity was not a significant predictor for drop out in the first year ($F(2, 300) = 2.15, p=.118$). However, the coefficient for Black versus White students was significant: the odds for Black students were .50 that of White students (equivalently, the odds of White students dropping out were 2.01 times that of Black students ($t(1)=2.07, p=.039$)).

A similar regression model was run to examine students' enrollment status at the conclusion of their third academic year (i.e. 2005-06), except that a variable for the total federal loan amount borrowed through the third year was added. There was a significant negative effect of taking out a federal loan in the first year, with borrowers now having an odds of dropping out 1.95 times that of non-borrowers three years after enrollment (see Table 3; $t(1)=3.36, p=.001$). The amount borrowed was significant, with an odds ratio of .81, which is equivalent to an increase in odds ratio for graduating, transferring, or remaining enrolled versus dropping out equal to 1.23 times that of non-borrowers per \$1,000 in loan debt ($t(1)=5.04, p<.001$). In the third year model, first-year attendance pattern and GPA were again significant, each in the expected directions (see Table 3, $t(1)s > 2.93, p's < .005$). There was also a significant effect of income status in the third year model, with students who received a Pell Grant in their first year having odds of dropping out 1.93 times that of students who did not receive Pell ($t(1)=4.29, p>.001$). Race/ethnicity was a significant predictor for drop out by the third year ($F(2, 300) = 3.57, p=.0294$). The odds for Black students were .59 that of White students (equivalently, the odds of White students dropping out were 1.68 times that of Black students ($t(1)=2.40, p=.017$)).

The same predictors in the three year model were used in the six year (i.e. 2008-09) regression model. Again, there was a significant negative effect of taking out a federal loan in the

first year, with borrowers having an odds of dropping out 1.57 times that of non-borrowers ($t(1)=2.15, p=.032$). The total amount of federal loans taken by the third year was significant, with an odds ratio of .88, which is equivalent to an odds ratio for graduating, transferring, or remaining enrolled 1.14 times that of non-borrowers per \$1,000 in loan debt ($t(1)=4.13, p<.001$). In the six year model, income status, attendance pattern, and GPA were all significant again in the expected directions (see Table 3, $t(1)s > 2.16, p's < .05$).

Based upon Chen's (2008) conceptual model, three sets of interactions were considered as potential additions to each of the regression models: loan status x race/ethnicity, loan status x income (i.e. Pell Grant) status, and loan status x attendance pattern. The only interactions that were significant were the loan status x income status interaction in the third year. Therefore, the interaction results are discussed here rather than presented in table format. For students who received a Pell Grant during their first academic year, the odds of dropping out did not increase significantly ($OR = 1.39, t(1) = 1.34, p=.181$). In contrast, for students who did not receive a Pell Grant, the odds of dropping out were 2.6 times higher if a federal loan was taken ($t(1)= 5.10, p<.001$).

Discussion and Implications

Before providing a discussion of the effects of loans on persistence, it is worth giving attention to the other notable findings from our study. Descriptive results suggest that Hispanic students are more averse to using loans than their White and African American peers. Hispanic students comprised 16.6% of the entire sample in this study, but represented only 5.7% of the students who took out federal loans during their first year of enrollment. This supports the view that many Hispanic students choose to begin their postsecondary careers at a community college, rather than a four-year institution, as an intentional way to avoid student loan debt (Cunningham

& Santiago, 2008). A somewhat unexpected finding from our study was that after matching students with similar background characteristics, Black students were less likely to have dropped out than White students at the end of years one and three. This finding needs further empirical testing, but may suggest that race/ethnicity is not the primary factor behind the comparatively low persistence rates among this student population. Rather, the collective barriers faced by a disproportionate number of Black community college students (e.g. lower-income, first-generation college, academically underprepared) are stronger predictors of their persistence.

Receiving a Pell Grant in year one was used in this study as a proxy for lower-income status. The regression results indicated that after matching similar students, Pell recipients had significantly higher odds of dropping out at the year three and year six time points compared to student who did not receive Pell. Our focus in this study was federal loans so we did not estimate the amount of Pell received, include the number of years Pell was awarded, or examine other supplemental sources of grant aid. Some studies have found that Pell Grant receipt is associated with lower within-year persistence among community college students (Hippensteel, St. John, & Starkey, 1996; St. John & Starkey, 1994), a finding attributed to the host of financial barriers these students face in remaining enrolled and not by recipient of the grant itself. But several studies applying more sophisticated analytic methods have found that Pell Grants had a positive effect on community college student persistence to the second year (Bettinger, 2004; Mendoza et al., 2009). In either case, our findings support claims that the current availability of need-based grant aid is not sufficient to meet students' total costs of attending community college (Baime & Mullin, 2011; Kennamer, Katsinas, Schumacker, 2010), as approximately two-thirds of the borrowers in our sample belonged to the two lowest income quartiles.

Numerous studies have found that part-time attendance is a major barrier to community college persistence (Adelman, 2005; Crosta, 2103; McKinney & Novak, 2013). After matching similar students, our results indicated that students who enrolled exclusively part-time in year one, compared to full-time, were much more likely to have dropped out at each of the three time points. This underscores the importance for part-time students to exercise caution when using loans to finance their college education, as they have considerably higher odds of dropping out than peers enrolled full-time. Fewer studies have empirically examined the impact of mixed enrollment (e.g. full- and part-time attendance) on community college persistence. Our results showed that after matching, students with mixed enrollment patterns were not more likely to dropout than their full-time peers, and were actually less likely at the end of year one to have dropped out. Therefore, institutional researchers and other college decision-makers should not assume that educational outcomes for community college students who fluctuate between full- and part-time enrollment are similar to those students who attend exclusively part-time.

Now we turn our attention to the effects of loans on institutional departure. Results from our study suggest that when matching community college students who share similar background characteristics, those who borrow federal student loans during their first year of enrollment have higher odds of eventually dropping out than non-borrowers. The longer-term negative effects of taking out loans appear to be masked during the first year of college, which could help explain why results from several prior studies found a positive relationship between loans and first-year community college persistence. In general, our findings support the conclusions reach by Dowd and Coury (2006) that, “all else equal, students who take loans will arrive at a more negative assessment of the net benefits of a community college education than their peers. As students assess their aptitude for college work and the prospects for a financial return to their educational

investment, those who have loans will more quickly become dissatisfied with their college investment decision and withdraw” (p.52-53).

More specifically, results from our study suggest that for those who take out loans this negative assessment of the benefits of attending college more often occurs subsequent the first year of enrollment, which could be attributed to a combination of several factors. By the third academic year of college, many borrowers may have encountered multiple experiences of non-success (e.g. failure to complete developmental coursework, dropping or failing college-level courses, slow accumulation of credits hours) and begin to realize they may not complete their degree or successfully transfer. A borrower may also recognize by their third academic year that they have underestimated the total amount of time and financial resources that would be required to achieve their educational goals. Rather than continuing to acquire more debt, the borrower’s reassessment of the potential costs and benefits of remaining enrolled are such that dropout has become the preferred alternative. There are very few circumstances in which dropping out prior to degree completion is a wise decision for a borrower. However, accruing additional debt for three years or more and then dropping out only exacerbates the extent of financial hardship the student faces during loan repayment.

Some studies have found that higher levels of loan debt are associated with increased odds of persistence among community college students (Cofer & Somers, 2000; Cofer & Somers, 2001). In our study, the cumulative level of federal loan debt at the end of year three (i.e. 2005-06) was included in the year three and year six regression models. After matching similar students, borrowers with higher levels of debt were less likely to have dropped out at the three and six year time points. This finding is not particularly surprising given that borrowers who are still enrolled are likely taking out loans each year. Similarly, borrowers who are highly

motivated to persist and graduate may be willing to assume higher levels of debt to reach their goals (Cofer & Somers, 2000). While beyond the scope of the present study, important next steps for future research are to determine how the amount of loans taken in a given semester impacts enrollment and employment behaviors. Does borrowing more money enable community college students to complete more credit hours each semester and spend less time at work?

In examining the interaction effects of loans x income status (Chen 2008), our findings indicated that borrowers who did not receive a Pell Grant in year one were more likely to have dropped out by the end of the third year than borrowers who were Pell recipients. This may suggest the cumulative aid amount received from Pell Grants and federal loans helps assuage some of the liquidity constraints faced by the lowest income community college students. But in 2007-08, approximately 80% of full-time community college students still had unmet financial need after all aid had been awarded and the average gap between aid received and total college cost was approximately \$5,300 (The Institute for College Access & Success, 2009). Therefore, many borrowers who do not qualify for Pell Grants still have considerable financial need even after taking out federal loans. Receiving Pell Grants (and other sources of need-based aid) can significantly reduce the amount of loan debt a student accrues, and decrease the number of hours worked in order to be able to pay for college. Liquidity constraints faced by community college borrowers who not qualify for or receive need-based aid, but still have unmet financial need, are expected to increase their odds of dropping out.

Three years after initial enrollment in the community college, 34.2% of students who took out a federal loan in their first year were no longer enrolled. The median debt level among the 14.6% of borrowers who had earned a credential from the community college by their third year was approximately \$5,500. Given the earnings increase in the labor market that results from

holding an associate's degree, compared to a high school diploma (Baum, Ma, & Payea, 2010), taking out loans will likely provide a good return on investment for this population of borrowers. Conversely, the median loan debt level among the borrowers who had dropped out by year three without having earned a credential was approximately \$3,000. While this level of debt may seem relatively small, the consequences of any debt burden for lower-income borrowers who drop out without a degree can result in immediate financial hardship. In 2009, borrowers who dropped out had higher unemployment rates, made less money, and were four times more likely to have defaulted on their loans than borrowers who graduated (Education Sector, 2012). Considering these trends in light of the fact that the majority of community college students come from households with limited financial resources and are unable to depend on their support networks (e.g. parents, friends, kin) for monetary assistance (Malcom, 2013), it becomes apparent how a few thousand dollars in loan debt can place severe financial burden on these borrowers.

The current aggregate federal loan limits were developed to accommodate a reasonable level of borrowing for a bachelor's degree. Often times public policies developed with four-year college students in mind can have unintended consequences, or adverse effects, when applied to the community college context (Mullin, 2013). Federal student loan policy currently allows a community college student who enrolls half-time (i.e. six credit hours per semester) to borrow the same maximum amount as a student who enrolls in five or more classes. This has enabled millions of lower-income students who attend the community college exclusively part-time to accumulate more and more debt each semester while making very slow progress towards degree completion or transfer. In addition, new students who are academically underprepared for college (the vast majority who enroll at community colleges) are allowed to borrow the maximum loan amount, even before they have demonstrated an ability to successfully complete college-level

coursework. These trends have not gone unnoticed among community college financial aid counselors, some of whom have expressed frustration over their lack of authority to curtail risky borrowing behaviors among their students (McKinney, Roberts, & Shefman, 2013).

At present, procuring thousands of dollars in federal loan debt can be accomplished by eligible students by filing a FAFSA and watching an online Entrance Counseling video on the Department of Education (DOE) website before signing a promissory note². Students who answer counseling questions incorrectly need only to guess again until they select the correct answer, and they are then allowed to proceed through the counseling session. Many borrowers never personally meet with a financial aid counselor to discuss the implications of this major financial decision. Watching the Financial Awareness Counseling video on the DOE loan webpages is optional, not required, to obtain a loan. Given the lack of financial knowledge among many community college students (Starobin, Hagedorn, Purnamasari, & Chen, 2013), serious consideration should be given to modifying the steps that these students must complete before having the ability to procure thousands of dollars in loan debt that must be repaid with interest. Providing prospective borrowers with early and accurate information about loans, along with personal counseling, is a more proactive and responsible way to address the student debt problem than intervening after the borrower has experienced financial hardship during repayment.

Many community college financial aid offices are severely understaffed (College Board, 2010), with counselor-to-student ratios higher than 1-to-1,000 at many campuses (McKinney & Roberts, 2012). Clearly this ratio is a barrier to providing thorough and timely advice to each student seeking guidance about using loans. The inaccessibility of counselors is particularly

² The steps required for students to take out a federal loan are available at <https://studentloans.gov/myDirectLoan/counselingInstructions.action>

problematic because many community college students have relatively low levels of financial literacy (Starobin et al., 2013) and misconceptions about how loans work (McKinney, Roberts, & Shefman, 2013). Because their home environments (Vargas, 2004) and high schools (McDonough, 1997) often do not provide lower-income students with guidance about financial aid and college costs, financial aid counselors at the community college are often the first, and only, personal contact that can help students make informed decisions about borrowing.

Our analyses indicate the largest percentage (32.2%) of community college students who took out federal began doing so during their first year of enrollment. Therefore, financial aid offices should make a focused effort to help first-year students receive the information and guidance they need to more accurately assess the costs and benefits of using loans. Orientation sessions and success courses for new students that include a discussion of financial aid options are necessary, but not sufficient. Federal student loans are considered entitlement funds, so at present colleges cannot make attending loan counseling an eligibility criteria before taking out a loan. But this policy needs to be reconsidered and one-on-one sessions with a counselor should be required for students who intend to take out loans, as there is growing evidence that most community college students simply ‘don’t do optional’ (see Community College Center for Student Engagement, 2012). Equally important, financial aid counselors should provide a realistic assessment of the potential consequences of using loans for students who may be at heightened risk for future loan hardship. For example, prospective borrowers whose math skills require remediation (26.4% of the borrowers in our sample enrolled in a remedial math course during their first year) may need additional counseling to understand interest rates, repayment terms, and other financial concepts that accompany the use of loans.

Community college financial aid offices need greater authority to prevent risky borrowing behaviors and limit loan amounts for at-risk student groups. The current statute of Section 479A of the Higher Education Act indicates that colleges may deny or limit loan eligibility only on a case-by-case basis. Colleges are reluctant to use this authority because considering each case individually is a time-consuming and potentially costly process (National Association of Student Financial Aid Administrators [NASFAA], 2013), placing additional work on community college financial aid offices that are already understaffed (College Board, 2010; McKinney & Roberts, 2012). Moreover, NASFAA (2013) explains that colleges are hesitant to use their authority to deny or restrict loan eligibility because some students may misinterpret this action as discriminatory, which can lead to costly investigations or even lawsuits. Providing colleges with the authority to limit loan amounts for groups of students, rather than on a case-by-case basis, could help curtail the number of community college borrowers who continue to take out the maximum annual loan amount while making very slow progress towards a degree or transfer (i.e. students who attend exclusively part-time, students who enroll in only one semester in a given year).

For community colleges, the authority to prorate loan amounts based upon students' enrollment status and academic progress could potentially reduce financial hardship and default rates by limiting the total debt burden of borrowers who drop out before earning a credential. By allowing part-time students to borrow only half of the maximum annual loan limit and full-time students borrow the full amount, federal loans could be leveraged as an incentive to encourage more community college students to pursue full-time study. Approximately 9% of the borrowers in our study had dropped out before the end of their first year of enrollment, while 34% had dropped out by year three. NASFAA (2013) recently proposed a student loan eligibility index

based on the premise that it is unwise and socially unjust to put students who are unprepared for college-level work (and therefore at higher risk of dropout) into loan debt. Students at the greatest risk for academic non-success would not be allowed to borrow *initially* or would be limited to a lower loan limit. At the community college, this type of eligibility index could be helpful in determining loan eligibility guidelines for the large numbers of students who are required to take remedial coursework in one or more subject areas. Students who demonstrated academic momentum and the capacity to successfully complete their coursework would then become eligible for loans or the maximum loan amount. In addition, automatically enrolling all borrowers in the income-based repayment plan (see Hillman, 2013; NASFAA, 2013) is a policy that could help assuage financial hardship among community college borrowers.

Community colleges have very limited control to prevent students from over-borrowing, but the schools are then held liable for their cohort default rates. As NASFAA (2013) has stated, “this represents a huge disconnect in federal policy because it places responsibility for defaults on the school without providing schools with practical methods needed to prevent them” (p. 24). When community colleges elect not to participate in the federal loan programs, students at these colleges are protected from federal loan default that can have long-lasting negative consequences on their financial well-being and livelihood. However, denying an entire student body access to federal loans may not represent the best strategy to address this problem. A growing number of community college students are unable to pursue higher education without loans and the intended consequences of denying students access to federal loans (e.g. reducing access, increasing credit card or private loan use, reducing credit hours attempted, increasing hours worked off campus) may collectively create worse problems (The Institute for College Access & Success, 2012). Notably, some community colleges that had formerly elected not to participate in

the federal loan programs have opted back in, often citing a growing demand from their students or reductions in the availability of state need-based grant aid. Changes in current federal student loan policy are needed so that community colleges are not faced with the difficult decision of denying federal loans to those students who need these funds to enroll and persist in college.

The effect of loans on the enrollment behaviors and completion rates of community college students is an area that still requires more investigation and empirical evidence. While accurately estimating the causal effects of loans on student behaviors is no simple undertaking (see Dowd, 2008), findings from our study, in conjunction with the rising rates of loan use and default among community college students, corroborate this is a policy issue that deserves more attention. Federal loans often represent only one of several sources of debt (e.g. credit card, mortgage, car loan, non-federal student loan) for community college students, so there is a need to better understand how cumulative debt burden and existing financial obligations impact their educational outcomes. Qualitative research that examines the complex ways in which loans, and the utilization of other forms of debt, impacts community college students' enrollment patterns and college experiences would also represent a valuable contribution to the literature. These studies could help provide a more nuanced understanding of *why* students borrow in the first place and what factors they considered (if any) in assessing the costs and benefits of using loans to pay for community college.

Conclusion

In sum, our findings suggest that federal loans did more to hinder, rather than help, persistence among community college students during the time period under investigation. Undoubtedly there are thousands of students each year who benefit from federal loans and the relatively low levels of debt accrued by students who complete their certificate or associate's degree will likely prove a wise financial investment for these students. But after matching similar

students, borrowers had significantly higher odds than non-borrowers of dropping out. It seems loans are the proverbial catch-22 when applied to the community college context. Many of the lower-income students attending these open-access institutions would simply be unable to ever access, and therefore graduate from, college without the availability of loans. The ability to attend college full-time, work fewer hours off-campus, and become more engaged in campus life are important benefits often afforded to students who borrow. Conversely, many community college students who take out loans will never earn a postsecondary credential and these borrowers are at heightened risk of loan default, which has far-reaching financial consequences. Discouragingly, recent estimates suggest that nearly one out of every three (31%) community college borrowers will default on their loans within 15 years of entering repayment (Field & Brainard, 2010).

Until current federal student loan policy and guidelines are modified, every effort should be made to ensure that loans do not become a conventional source of aid used by community college students. As policymakers and college leaders consider strategies to increase community college completion rates, policies or practices that would result in increased loan use and debt burden among this student population should be avoided. Our nation's community colleges currently enroll about half of all undergraduates in the U.S. and the largest proportion of lower-income and racial/ethnic minority students (Malcom, 2013). With concerns about college costs and student debt at an all-time high, community colleges serve a more important societal role than ever by providing an accessible, affordable pathway to the middle class for millions of individuals whose financial and life circumstances often preclude them from attending four-year institutions. Current federal loan policies and college financial aid practices need to be carefully reconsidered to ensure that loans do not further exacerbate the financial well-being of thousands

of lower-income students who depend upon the community college to provide a pathway out of poverty and towards economic prosperity.

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Table 1: Descriptive Statistics for the Sample (n=4,530)

	Entire Sample		Borrowed in First Year		
	Unweighted N	Weighted %	Unweighted N	Weighted %	
<i>Gender</i>					
	Female	2,650	57.3	530	64.0
	Male	1,880	42.7	340	36.0
<i>Race/Ethnicity</i>					
	White	2,810	66.7	600	74.0
	African American	740	16.7	170	20.3
	Hispanic	590	16.6	50	5.7
<i>Age in 2003</i>					
	15-24	3,730	77.1	700	76.5
	25+	800	22.9	180	23.5
<i>Income Status</i>					
	Low-Income	1,550	31.4	280	31.3
	Mid-Low Income	1,320	27.0	300	33.7
	Mid-High Income	1,020	24.9	210	25.3
	High Income	640	16.7	90	9.8
<i>Delayed Enrollment</i>					
	No	2,830	55.9	500	51.2
	Yes (1 year or more)	1,680	44.1	360	48.9
<i>Enrollment Intensity</i>					
	Full-Time	2,760	47.6	630	64.5
	Part-Time	1,100	36.4	120	22.0
	Mix of Full- and Part-time	670	16.0	120	13.5
<i>Enrollment Status (2003-04)*</i>					
	Dropped out/Not enrolled	460	13.0	60	8.7
	Still Enrolled No Degree	3,290	71.2	620	70.7
	Transferred	740	14.9	180	20.0
	Attained (Certificate or Associates)	50	0.9	10	0.8
<i>Enrollment Status (2005-06)*</i>					
	Dropped out/Not enrolled	1,490	38.6	240	34.2
	Still Enrolled No Degree	820	18.1	150	16.5
	Transferred	1,470	30.2	320	34.7
	Attained (Certificate or Associates)	750	13.2	160	14.6
<i>Enrollment Status (2008-09)*</i>					
	Dropped out/Not enrolled	1,490	37.5	270	36.1
	Still Enrolled No Degree	370	9.1	50	6.1
	Transferred	1,570	32.6	340	36.8
	Attained (Certificate or Associates)	1,090	20.8	200	21.0

Note: Unweighted ns rounded to the nearest 10 per NCES data security guidelines. Column totals for percentages may not equal 100% due to rounding.

* Refers to enrollment outcomes at the community college first attended.

Table 2: Borrowers' Federal Loan Debt Levels by Enrollment Status

Persistence/Attainment	Borrowed	Federal Loan Debt				
	Weighted %	Minimum	Maximum	Median	Mean	Linearized SE
<i>Enrollment (2005-06)*</i>						
Dropped out	26.2	195	21,532	2,922	4,087.64	241.88
Still Enrolled	16.5	500	22,419	5,052	5,753.96	278.62
Transferred	41.0	167	27,624	5,033	5,530.86	189.25
Attained	16.3	356	21,200	5,500	6,122.59	359.49
<i>Enrollment (2008-09)**</i>						
Dropped out	25.6	1,000	44,764	5,865	8,374.78	992.26
Still Enrolled	24.2	700	51,273	7,523	9,596.96	837.30
Transferred	18.1	2,249	39,307	12,250	14,161.97	930.77
Attained	32.2	1,050	38,306	9,625	11,368.79	1,324.72

Note: The weighted percentages represent students who borrowed a federal loan at any time point during the six year period under investigation. Enrollment outcomes refer to the community college first attended.

*Unweighted n=1,530

**Unweighted n=370; sample includes borrowers who were still enrolled or had transferred by year three and does not include those who had already dropped out or attained a degree/certificate by year three.

Table 3: Logistic Regression Models Examining the Effects of Federal Loans on Student Dropout

Variable	Year One			Year Three			Year Six		
	Odds Ratio	95% C.I.		Odds Ratio	95% C.I.		Odds Ratio	95% C.I.	
		Lower	Upper		Lower	Upper		Lower	Upper
Race/ethnicity (White)									
African American	.50*	.26	.97	.59*	.39	.91	.74	.51	1.10
Hispanic	.84	.34	2.09	.56	.29	1.08	.71	.38	1.33
Enrollment Intensity (Full-time)									
Mix of Full- and Part-time	.38*	.16	.91	.92	.53	1.58	.84	.49	1.43
Exclusively Part-time	1.90*	1.01	3.58	2.36***	1.49	3.75	2.04**	1.31	3.18
Grade Point Average									
(.10 increment)	.96*	.93	1.00	.97**	.94	.99	.97*	.95	1.00
Received a Pell Grant (No)									
Yes	1.06	.58	1.94	1.93***	1.43	2.61	1.72***	1.24	2.38
Borrowed a Federal Loan (No)									
Yes	.48**	.28	.81	1.95***	1.32	2.89	1.57*	1.04	2.37
Debt Level (end of year 3)									
(in \$1,000s)				.81**	.74	.88	.88***	.82	.93

Unweighted n = 1,510

*p ≤ .05, ** p ≤ .01, *** p ≤ .001

Appendix A

Balance Check for Propensity Score Stratification

Predictor used in Propensity Model	Balance Before Stratifying By Propensity Scores			Balance After Regressing Covariates by Loan Status and Stratum Indicators		
	B	SE	p	B	SE	p
Gender	.116	.077	.131	.007	.033	.933
Primary Language	1.03	.172	.001	.206	.216	.340
Age	.002	.005	.647	-.001	-.006	.834
Dependency Status	.195	.082	.017	.008	.092	.934
Race/Ethnicity*	-1.31	.153	.001	-.173	.171	.309
Parent Education*	-.014	.015	.339	-.005	.013	.782
Delayed Enrollment	.229	.077	.003	.046	.087	.805
Income Group	-.037	.036	.295	.001	.041	.983
High School GPA	-.022	.010	.021	-.001	.011	.937
Hrs Worked Per Week	-.012	.002	.001	-.001	.003	.621
Highest Level Expected	-.056	.027	.001	.002	.030	.951
Associates Degree Type	.297	.080	.001	-.053	.090	.556
Parent Help	-.120	.031	.001	-.017	.035	.631
Unmet Financial Need	.432	.008	.001	0.40	.035	.691
Intend to Transfer	-.487	.079	.001	-.079	.089	.374
# Family in College	-.0522	.018	.005	-.003	.021	.904
Degree of Urbanization	.083	.017	.001	-.018	.017	.279
% Minority Enrollment	-.021	.002	.001	-.003	.003	.265

*For variables with multiple categories, the overall p is given, but coefficients represent category with the “least” balance.

Appendix B

Region of Common Support for Propensity Score Analysis

