

The Complex Relationship of Student Loans and Persistence

Institute of Higher Education

University of Georgia

Abstract

Student loans, especially federal loans, are an important strategy for assisting students in financing higher education. Given their prevalence and long-term growth, understanding the role of student loans in persistence and attainment is especially important. This paper synthesizes current knowledge on the relationship between student loans and attainment. The goal is to convey a sense of the complexity this relationship, which is often conditional on other factors. The analysis includes recommendations not only for future financial aid research, but also on the role of financial aid within the broader body of research on persistence and attainment.

Introduction

For the 2015-16 academic year, undergraduate students borrowed a total of approximately 60 million dollars in federal loans to subsidize their education (The College Board, 2016). Over a third of undergraduates borrow at some point in their college careers, and, at 36%, loans comprise the largest proportion of federal financial aid to college students (The College Board). By any measure, then, student loans, particularly federal loans, play a significant role in student financing of higher education.

Given the prevalence of student loans as a financing strategy, it is imperative to understand how this financing strategy affects the college-going process. How do the availability of loans, especially as compared to other forms of financial aid, the prospect of debt, and related factors extend or limit access to higher education? Do they increase or decrease students' college choice sets? Once on campus, do students approach their college experiences with an eye toward their loan debt? Do student loans promote or hinder their degree attainment?

Although all of these questions are important, this paper focuses on the role of loans in only one stage of the college-going process, persistence and attainment. Specifically, I argue that, in spite of a substantial body of theoretical and empirical literature on financial aid, the nature of the relationship between loans and persistence and attainment remains unclear. What is clear is that the relationship is complex, complicated by many intervening factors and methodological challenges. This paper explores such complexities and suggests directions for future research to clarify and enhance our understanding of student loans and attainment.

I begin by considering current trends in higher education that underscore the importance of studying financial aid, attainment, and the relationship between them. I then explore theoretical underpinnings that may aid in clarifying the nature of this relationship, review the

findings of recent, rigorous empirical studies of student loans and attainment, and discuss methodological challenges. I conclude with implications for policymakers and researchers, both those studying financial aid issues and those studying persistence and attainment more broadly.

Relevant Trends in Higher Education

Although the potential of financial aid to leverage persistence and attainment has long been of interest to higher education researchers, recent developments render research in this area especially timely. These include long-term trends in the finance of higher education from both institutional and student perspectives as well as more recent developments, such as the emerging “college completion agenda.”

Trends in Student Financial Aid

The long-term trend in federal financial aid policy toward increased reliance on student loans and the potential consequences have been well-documented. Today, student loans account for about 36% of total federal student aid, down from recent highs of about 50%, but up overall since the introduction of the federal financial aid programs (The College Board, 2016; Hearn, 1998). This trend is likely due in part to the relatively low eligibility criteria and resulting widespread availability of this form of financial aid. Meanwhile, though the Pell Grant and other federal financial aid programs are not necessarily declining in real dollars, the purchasing power of Pell Grants has declined (Heller, 2011; Zumeta, Breneman, Callan, & Finney, 2015). For the 2016-2017 academic year, the maximum federal Pell Grant was about 60% of average tuition and fees at public four-year institutions, excluding other factors contributing to total cost of attendance (The College Board). Together, these trends reflect a philosophical shift in the purposes of the federal financial aid program from providing generous grants to the neediest students to increasing affordability for a broader population, notably middle-class students

(Heller). Trends in state- and institutional-level policy toward merit aid have further limited what is available to the neediest students, who often do not qualify for such programs (Heller; Hearn, 2001). This suggests a need to examine whether student loans are an effective financing strategy with regard to attainment, both in the aggregate and for students of diverse income backgrounds.

The Broader Higher Education Financial Context

Other trends in higher education finance with implications for student borrowing include the paradoxical pair of rising institutional costs and declining revenue from traditional funding sources. Researchers have identified a variety of factors contributing to this tendency, including the ambiguity and complexity of higher education's mission (Bowen, 1980) and limited opportunities for increasing efficiency due to the human resource-intensive nature of the industry (Baumol & Bowen, 1966). The basic operating costs of an institution are also increasing due to new regulations, the rising price of health care, and other factors (Johnstone, 2016; Zumeta, Breneman, Callan, & Finney, 2015). At the same time, state appropriations to higher education have generally declined, with only occasional increases in appropriations that do not come close to matching the highs of the past (Johnstone; Zumeta et al.). Such trends have triggered tuition and fee increases outpacing inflation at many institutions, though it is important to note that many students do not pay full tuition and fees due to institutional financial aid programs.

While rising costs to students may not automatically increase borrowing, they may contribute to a broader challenge to affordability. Given the declining purchasing power of Pell Grants and limited financial aid alternatives for students not qualifying for merit aid. In light of this possibility of continuing increases in student borrowing rates, it is vital to fully understand the implications of student loans for outcomes central to the mission of higher education.

Efforts to Increase Attainment Rates

Persistently low attainment rates and recent efforts to increase these rates further underscore the need for research on any mechanisms that may bolster or hinder students' likelihood of completing. Based on the most recent data available, only about 60% of students beginning at four-year institutions earn a bachelor's degree within six years, while about only 30% of students beginning at two-year institutions earn an associate degree within three years (NCES, 2016). While such low figures are problematic in themselves, they also mask disparities for historically underserved students, including students from low-income backgrounds in need of financial aid (Schudde & Goldrick-Rab, 2016).

Policymakers, intermediary organizations, institutions themselves, and other constituents are all interested in increasing attainment rates (Zumeta, Beneman, Callan, & Finney, 2015). Former President Obama introduced Goal 2020, which sought for the United States to lead the world in proportion of adults with postsecondary credentials (Zumeta et al.). Many states have adopted their own college completion goals, as have prominent and well-resourced organizations like Complete College America, the Lumina Foundation, and the Bill and Melinda Gates Foundation (Zumeta et al.). From an institutional perspective, increasing completion rates is not only necessary to fulfill institutional missions, but also for effective enrollment management and to meet state-level calls for accountability (McGuinness, 2016).

In this context, it is vital to identify factors that may contribute to or detract from these goals. Variables like student loans and other financial aid policies are of particular interest because policymakers and institutions exercise a greater deal of control over these factors than they do over, for example, students' family obligations. Coupled with rise of student loans as a financing strategy and challenging financial trends in the higher education industry as a whole,

this suggests a particular need to inventory and advance the research on student loans and persistence and attainment.

Explaining “Why”: Theoretical Underpinnings of Research on Student Loans

Researchers have drawn on a number of theoretical perspectives to attempt to explain why and in what direction student loans might affect persistence. This section reviews some of the most common perspectives, though there are many others.

Economic Theories

Human capital theory explains the pursuit of higher education as an investment in oneself that enhances the skills and abilities with which a student initially enters higher education (Becker, 1993). Students opt to invest in themselves when they perceive the benefits of their human capital development as outweighing the costs of pursuing higher education. Researchers employing this framework have examined a wide variety of potential costs, including financial aid, that might influence enrollment and persistence decisions (Long, 2007). Regarding student loans, human capital theory would suggest that the influence of student loans on persistence hinges on the extent to which students view them as costs or as offsetting costs, in conjunction with other costs entering their particular cost-benefit analysis. It also suggests that students will likely treat grants and loans differently as there are different costs and benefits associated with each type of aid. Because this cost-benefit analysis is ongoing, human capital theory introduces the possibility that student loans may positively influence persistence only to a point at which the costs of debt exceed the benefits of college. It is important to note that some have critiqued the potential of human capital theory for explaining the relationship between price, financial aid, and attainment because underlying assumptions do not allow for differences in educational opportunities (Goldrick-Rab, Harris, & Trostel, 2009).

Other economic concepts also have the potential to inform our understanding of the role of student loans in the attainment process. For example, Chen (2008) proposed employing a modified human capital lens that incorporated the constructs of liquidity constraints, price elasticity, and debt aversion. He argued that these are especially relevant for understanding observed differences between students identifying as White and students of color and between students from different income brackets. More specifically, students from low-income backgrounds may encounter greater liquidity constraints limiting their borrowing options while evidence suggests that both these students and students of color respond differently to prices and debt than do students from White, middle-class backgrounds. Similarly, Goldrick-Rab, Harris, & Trostel (2009) offered behavioral economic concepts such as risk and ambiguity aversion, information asymmetries, work preferences, and the meaning of money to individuals and groups, designed to explain why financial aid affects attainment. Such concepts may have particular relevance for analyzing the role of student loans as opposed to grants because of the higher risk, greater misinformation, and potential meaning of debt associated with loans.

Persistence Process Theories

Derived from sociology and psychology, persistence process theories emphasize the role of student-institution fit and student interaction with their institutions in shaping persistence and attainment. Tinto's (1993) Interactionist Theory of Student Departure remains one of the most widely cited persistence process theories (Mayhew et al., 2016). Tinto emphasized the way in which the personal characteristics and prior experiences students bring to college affect their interaction with the college environment. Coupled with pre-college factors, these interactions promote or hinder students' academic and social integration into their college environments, which in turn drives goal commitment, institutional commitment, and persistence. However,

Tinto did not allocate a significant role for finances in his model, and did not even include finances in early versions of this model (Braxton, 2000; Cabrera, Nora, & Castaneda, 1993; Stuart, Rios-Aguilar, & Deil-Amen, 2014). He argued that, at most, finances had indirect effect on persistence, though this could occur in several ways. For example, he posited that finances play a direct role in college choice, and the fit between student and institution resulting from this choice could affect integration and thus persistence. Similarly, finances could potentially “pull” students from the institution, perhaps due to employment designed to pay for school, again affecting integration (Mayhew et al.). According to Tinto, then, student loans might be expected to have a positive effect on persistence if they reduced the need for off-campus work and thus increased the quantity and quality of student-institution interaction.

Although Tinto’s (1993) model remains popular, there have also been criticisms, notably for his treatment of student finances and of the appropriateness of the model for student populations historically underserved in higher education (Braxton, 2000; Melguizo, 2011). Attempting to address these criticisms, Cabrera, Nora, and Castaneda (1993) modified Tinto’s model to incorporate a measure of student finances, ability to pay, that they posited relates directly to persistence. This model would suggest a particularly important role for student loans as students likely vary in whether they consider loans as an option comprising ability to pay. Several other researchers have likewise adapted Tinto’s original model to attempt to better explain the experiences of underserved populations, such as low-income students, and to explain the role of financial aid in the persistence process (e.g., Berger, 2000; St. John, Cabrera, Nora, & Asker, 2000). Together, they provide a set of related explanations for how student loans and other forms of financial aid might influence persistence.

An Interdisciplinary Approach: Nexus Model

Paulsen and St. John (2002) drew on economic perspectives, notions of social and cultural capital, and persistence process theories to articulate their nexus model of college choice, cost, and persistence. Under the nexus model, the college-going process is viewed as a series of interrelated decisions; for example, the choice to attend a particular institution in part influences persistence at that institution, as do the factors that influenced that initial choice. They argued that both realities and perceptions are important factors in this process such that, if students choose an institution based on certain perceptions that turn out to be false, the student is likely to leave the institution. Unlike many persistence process theories, the nexus model identifies financial considerations, both real and perceived, as key variables in this process. Applied to student loans, this suggests that if debt-averse students choose a college under the assumption that they will not have loans, but then must borrow in subsequent semesters, they may be less likely to persist (Paulsen & St. John, 2002; St. John, 2001). More broadly, the advantages of the nexus model are in its consideration of perceptions of cost as well as actual costs and in its articulation of degree attainment as a longitudinal process, which better represents reality.

Findings from Empirical Studies on Student Loans and Attainment

Although there is a large body of literature examining financial aid, including the relationship between financial aid and attainment, there is relatively limited literature focusing specifically on the role of loans in this process (Dynarski & Scott-Clayton, 2013; Hossler, Ziskin, Gross, Kim, & Cekic, 2009; Long, 2008). This dearth of studies focusing on student loans is not necessarily surprising as other types of financial aid, especially grants, represent a much more significant investment on the part of the federal government or the institution

providing the grant. Yet this dearth of research is problematic given the prevalence of student loans in the financial aid landscape.

Research on student loans and attainment also varies widely in the soundness of the methods employed to analyze this complex relationship. This section synthesizes the extant empirical literature on the influence of student loans on attainment, relying primarily on studies employing quasi-experimental or strong multivariate designs informed by theory.

Overall, studies examining whether student loans promote or hinder persistence and attainment have yielded somewhat more positive than negative findings, but the literature remains mixed. Many studies yielding positive findings have important caveats; for example, some found a positive relationship that decreased over time. Other studies found an outright negative relationship or no relationship. Still others yielded mixed findings, or concluded that the effects of student loans are conditional on other factors. Interestingly, literature reviews of financial aid suggest that such inconsistencies have persisted over time (e.g., Hossler, Ziskin, Gross, Kim, & Cekic, 2009; Mayhew et al., 2016; St. John, 2001; Yu, 2014).

Evidence of a Positive Relationship between Student Loans and Persistence

Longitudinal studies of the relationship between student loans, semester-to-semester or year-to-year persistence, and subsequent attainment generally found a positive relationship between loans and outcomes that declined in magnitude over time. Using data from a single institution, DesJardins and McCall (2010) found that all forms of financial aid, including student loans, reduced the likelihood of having a first stop-out, which in turn increased the likelihood of graduation. By operationalizing loans in terms of loans awarded instead of in terms of loans accepted, they mitigated the effects of one potential confounding influence, students' decisions to accept or reject some or all of their loans. Chen and DesJardins (2008, 2010) employed

similar designs with nationally representative samples and yielded corroborating results, though in both studies they were only able to measure financial aid variables in the first year of college, and assumed that packages were identical in subsequent years.

Two studies found positive relationships between loans and persistence and attainment for samples of specific underserved populations. Gross, Zerquera, Inge, and Berry (2014) examined associate degree attainment of community college students identifying as Hispanic/Latino/a, using an event history design that accounted for annual changes in financial aid packages. This was an important design feature because it might be reasonable to expect a change in the relationship between loans and persistence over time as total loan debt accumulates. They found that loan amounts had a positive, significant relationship with persistence and associate degree attainment, though magnitude of the effect decreased over time. Chen and Hossler (2017) yielded similar findings examining a nationally representative sample of non-traditional community college students, defined as students attending part-time, delaying entry after high school, having dependents, being financially independent, or lacking a high school diploma. Like Gross et al., they found that receiving student loans had a positive effect on persistence, but that the magnitude of that effect decreased over time. Chen and Hossler's study is particularly important because they applied propensity score matching to account for potential systematic differences between students who receive and do not receive loans, and thus were better able to attribute observed differences in outcomes to loans rather than to other factors.

Typically, studies analyzing both loans and grants found that, though both had positive effects on persistence, the magnitude of the effect of loans was smaller (DesJardins & McCall, 2010; Chen & DesJardins, 2008, 2010). DesJardins, Ahlburg, and McCall (2002) conducted a

simulation analysis in which they replaced loan aid with equitable amounts of grant aid, and found that, though both types of aid had positive relationships with degree attainment, grant aid further increased the probability of degree attainment. Mendoza and Mendez (2013) examined a sample of Oklahoma students, and found that loans were only positively related to degree attainment only for students who also received the Oklahoma Promise Scholarship, a tuition scholarship with both need and merit requirements. In other words, the positive relationship between loans and degree attainment was conditional on simultaneously receiving grant aid, suggesting that the grant aid may have been the stronger mechanism for attainment. Mendoza and Mendez (2013) yielded comparable findings using both a traditional regression model and a fixed effects model, adding to the rigor of their study.

An emerging finding in the student loan literature is that subsidized loans may have a stronger positive relationship with persistence and attainment than unsubsidized loans. Chen and Hossler (2017) not only found Pell Grants to have a stronger effect than either type of loan, but also that subsidized loans had a stronger effect than unsubsidized loans. When Chen and DesJardins (2010) estimated a model with separate indicators of subsidized and unsubsidized loan receipt and compared effect sizes, they found smaller effect sizes for unsubsidized than for subsidized loans. Although the total subset of studies that have differentiated between subsidized and unsubsidized loans is small, most that have done so have found stronger positive effects for the former than for the latter (Mayhew et al., 2016). Additional replications across different samples are needed to further corroborate this emerging finding.

Such findings regarding the differential effect of student loans over the course of a student's career and the influence of student loans relative to other forms of financial aid are not surprising. As a student continues to receive loans over time, his or her debt will increase, likely

leading some students to conclude that the costs of higher education at some point outweigh the benefits (Becker, 1993) or for the burden of debt to adversely affect their integration into the campus community (Tinto, 1993). A similar cost-benefit analysis likely accounts for differences in magnitude of effects for loans versus grants and subsidized versus unsubsidized loans.

Evidence of a Negative Relationship between Student Loans and Persistence

A handful of studies have identified a distinctly negative relationship between student loans and persistence. Interestingly, studies yielding a negative relationship have tended to be cross-sectional rather than longitudinal in design. Such studies measured financial aid and other variables at a particular point in time and related those variables to a subsequent event, such as degree attainment, occurring years later. This methodological difference may explain some of the variation in findings; perhaps measuring the student loan variable at only one point in time masks the declining effect of student loans over time found in longitudinal studies and instead portrays the overall effect as negative.

Working from an institutional perspective, Jones-White, Radcliffe, Lorenz, and Soria (2014) examined whether first-year student loan amount was related to three possible outcomes: degree attainment from the first institution, degree attainment from a transfer institution, or no degree attainment within six years. Notably, they controlled for not only personal characteristics and pre-college and first-year college academic performance, but also for other cost and financial aid variables such as cost of attendance and grant receipt. They found that students receiving loans were significantly more likely to graduate from a transfer institution or fail to graduate in the study period than they were to graduate from the first institution.

Alon (2007) also found a negative relationship between student loans and persistence. He examined a sample of students of color attending elite universities, and employed parent

marital status as an instrumental variable to account for the systematic differences between students who qualified and did not qualify for financial aid. He also included covariates for personal characteristics, academic preparation, geographic region, and select college experiences. For this specific subpopulation, Alon found loan amount to have no effect on degree attainment while grant amount had a positive effect.

It is unclear why these findings differ so substantially from other findings in which there is a positive relationship between student loans and persistence. Major differences in methods likely explain some of these discrepancies in conclusions. Jones-White, Radcliffe, Lorenz, and Soria (2014) examined a sample from only one institution and Alon (2007) examined a sample featuring only a small number of homogenous institutions; thus, it is possible that these negative findings are restricted to these particular institutions or perhaps to comparable institutions.

Mixed Findings and Differential Effects

Not only has the literature as whole yielded contradictory findings on the relationship between student loans and persistence, but some individual studies have also had mixed, albeit systematic, results. Three types of studies tended to yield such findings, those examining both short-term persistence and long-term degree attainment in a single study, those disaggregating findings by income, and those disaggregating findings by race/ethnicity. Some might also consider the findings on the positive but decreasing effect of loans over time to be a mixed finding or differential effect.

Differences by outcome. A number of studies have examined the relationship between loans and both first-to-second year persistence and subsequent degree attainment for a single sample. Such studies have yielded the consistent findings of a positive relationship between student loans and persistence, but a negative relationship or no relationship between student

loans and degree attainment. This finding held for both associate degree attainment (Davidson, 2015; Dowd & Coury, 2006; McKinney & Burrige, 2015) and bachelor's degree attainment (Dowd, 2004). It was also consistent across both traditional regression designs (Dowd; Dowd & Coury) and quasi-experimental designs that may be preferable due to the ways in which they mitigate issues of selection bias (McKinney & Burrige).

These findings follow logically from the finding in most longitudinal studies that the positive effect of student loans decreases over time (e.g., Chen & DesJardins, 2008, 2010; DesJardins, Ahlburg, & McCall, 2002; Mendoza & Mendez, 2013). However, in such studies, student loans continued to have a significant positive effect, which differs from the relationship in most studies examining outcomes at only two points in time. It is unclear why such differences might occur, but the cross-sectional design of the graduation studies and longitudinal design of semester-by-semester persistence studies may account for this variation.

Income or socioeconomic status. Research suggests that students from middle- and upper-income backgrounds were more likely to experience positive effects of student loans on their persistence and degree attainment while students from low-income backgrounds were more likely to experience negative effects. Kim (2007) examined six-year degree attainment for a nationally representative sample, and introduced interaction terms relating first-year loan amount and family income. Kim found a positive relationship between loans and degree attainment for upper-income students, but negative effects for lower-income students. Paulsen and St. John (2002) identified a negative relationship between student loans and persistence for the two lowest income quartiles, but no relationship for students from the two highest income quartiles. Although Dowd and Coury (2006) found an overall negative effect of student loans on degree

attainment, there was a significant positive interaction effect between income and loans on persistence for those from the very top of the income distribution.

Although the precise relationships between student loans and outcomes for different income groups varies by study, what is consistent across studies is that the effects of loans differ in ways favorable to middle- and upper-income students. From one perspective, this can be thought of as a sign of effectiveness because the federal government initially introduced widely available student loans to increase college affordability for the middle class (Zumeta, Breneman, Callan, & Finney, 2015). From the perspective of equity as the overarching goal of the entire financial aid program, these differences in effects may be viewed as more problematic. Of course, the perhaps unanticipated decrease in the purchasing power of the Pell Grant is another important factor in evaluating the implications of these findings.

Race/ethnicity. As in the case of income, there is strong evidence of differences in the effects of loans by race/ethnicity. Kim (2007) observed a large negative relationship between first-year loan amount and six-year degree attainment for students identifying as Black/African American, and a smaller negative relationship for students identifying as Hispanic/Latino/a or Asian/Asian American. By contrast, Kim found a positive relationship for students identifying as White. Chen and DesJardins (2010) examined different financial aid packages, and found that packages with higher proportions of grants relative to loans were positively related to persistence for students of color. St. John (2001) likewise concluded that students identify as Black/African American or Hispanic/Latino/a were more responsive to financial aid packages that consisted of both grants and loans than to packages with loans alone.

That said, not all studies found negative relationships between loans and outcomes for students of color. Gross, Zerquera, Inge, and Berry (2014) found a positive relationship between

loans and associate degree completion for community college students identifying as Hispanic/Latino/a. Given other findings, it is possible that, had they included students identifying with other racial/ethnic groups, there may have been differences in the magnitude of the effects. Museus (2010) observed a positive direct relationship between student loans and graduation for students identifying as Black/African American, and Alon (2007) observed no effect of loans on outcomes for students of color at elite institutions. Thus, as with other findings on the relationship between student loans and outcomes, the evidence for students of color is mixed and likely complicated by the myriad other factors influencing student outcomes.

Methodological Challenges in Conducting Research on Student Loans

Several methodological challenges complicate the study of the effects of student loans on persistence and attainment. Although some of these issues previously emerged in the discussion of specific studies, they warrant additional attention, especially in light of recent methodological advances attempting to address these issues.

Selection Bias

Selection bias occurs when individuals are non-randomly distributed into a “treatment,” such as receiving a student loan. Because distribution is non-random, students receiving a loan may differ from students not receiving a loan in both observable ways, often partially addressed by control variables, and unobservable ways that are difficult to control (Goldrick-Rab, Harris, & Trostel, 2009; Reigg, 2008). In the case of student loan receipt and other financial aid interventions, federal loan eligibility is known to be correlated with other factors correlated with enrollment and attainment, such as family income; this introduces selection bias and inhibits the researcher’s ability to differentiate between the effects of receiving the loan and the effects of eligibility for the loan (Long, 2008). In the case of federal student loans, there are multiple

opportunities for selection to occur, including the decision to complete the FAFSA, meeting eligibility criteria for federal student loans, and opting to accept loans as part of one's financial aid package (Dynarski, 2002).

Beyond randomly assigning students to receive loans, a strategy that is likely infeasible, certain research designs and statistical methods mitigate the influence of selection bias.

DesJardins and McCall (2010) addressed one opportunity for selection bias, decision to accept or reject a loan, by substituting a variable for loans offered in lieu of one for loans received.

Goldrick-Rab, Harris, and Trostel (2009) argued that grounding a study of student loans in a sound theoretical framework can improve the study's explanatory power and better isolate the way in which student loans operate relative to other variables.

Many researchers have turned to quasi-experimental statistical techniques in an effort to not only isolate the role of student loans from other variables, but also move from identifying relationships to establishing causality (Dynarski, 2002; Goldrick-Rab, Harris, & Trostel, 2009; Reigg, 2008). Reigg identified several such statistical approaches, including propensity score matching, instrumental variables, and regression discontinuity, among others. Although promising and increasingly popular, quasi-experimental approaches are not flawless. Propensity score matching relies on the assumption that variables used to match "treated" and "untreated" students account for all unobservable characteristics that might be related to outcomes, while instrumental variables relies on identification of a variable that is correlated with treatment but not with outcomes. For example, the soundness of Alon's (2007) instrumental variables study of student loans and persistence relies on the assumption that parents' marital status is an appropriate instrumental variable. Most such justifications are open to criticism to some degree, though continued use of such methods and replication may lead to some consensus on

appropriate matching or instrumental variables. With this caveat in mind, quasi-experimental approaches remain one of the best alternatives for advancing our understanding of the true effect of student loans on persistence and attainment.

Variable Specification

A related issue is that it is not necessarily clear what construct a student loan variable is measuring. A researcher may intend to represent loan receipt, but the variable may actually measure income, a prerequisite for eligibility. It may also represent ability to pay, unmet need relative to tuition or cost of attendance, or psychological factors such as risk aversion. Aggregate variables indicating whether or not a student received any financial aid may be especially ambiguous (Chen, 2008). Researchers critiquing the student loan and financial aid literature have thus recommended employing amounts instead of dichotomous indicators, including separate variables for each type of financial aid, and including variables for tuition or cost of attendance (e.g., Chen; Hossler, Ziskin, Gross, Kim, & Cekic, 2009; Paulsen & St. John, 2002). As with the selection bias challenge, this may not completely mitigate the problems of variable specification, but it represents an improvement.

Limitations of Cross-Sectional Data

Another methodological challenge hindering progress in research on student loans is the tendency for most higher education to be cross-sectional or for key variables to be cross-sectional in nature. Measured at one point in time, cross-sectional data may not capture important changes affecting the relationship between financial aid and persistence (Chen, 2008; Goldrick-Rab, Harris, & Trostel, 2009). Indeed, there is evidence that the relationship between all forms of financial aid and persistence varies over time (e.g., Chen & Hossler, 2017; DesJardins & McCall, 2010; Gross, Zerquera, Inge, & Berry, 2014). It is logical to suspect that

the relationship would change as financial aid eligibility changes with progress in higher education; for example, there is a maximum on the amount of Pell Grant students can receive in their college careers, and loan eligibility increases with credits earned. As discussed earlier, the effects of loans may also change over time if students are willing to assume the \$10,000 in debt necessary for their first year, but not the \$20,000 in cumulative debt necessary for their second year. Moreover, persistence is a longitudinal process, suggesting that longitudinal data are optimal for modeling this process (e.g., Tinto, 1993).

Unfortunately, one of the most widely-used nationally representative datasets for studying financial aid and persistence, Beginning Postsecondary Students, is cross-sectional in key financial aid variables. Chen and DesJardins (2008, 2010), Dowd and Coury (2006), Kim (2007), and McKinney and Burrige (2015) are just some of the examples of student loan studies relying on various iterations of this dataset. While the dataset may be longitudinal in that it tracks enrollment and outcomes information over six years, as well as dichotomous indicators of financial aid, each semester, detailed financial aid data are only available for the first year. Models employing these data to study financial aid may overlook important changes over time.

Implications and Conclusion

Recommendations for Financial Aid Policy

Several recommendations for financial aid policy follow from this analysis. While evidence on the effectiveness of student loans as a persistence and attainment incentive is mixed, it is clear that loans are less effective than grants and low tuition for these outcomes (e.g., Chen & DesJardins, 2010; Chen & Hossler, 2017; DesJardins & McCall, 2010; Mendoza & Mendez, 2013; Paulsen & St. John, 2002). Importantly, this finding holds for students from a number of historically underserved groups, including non-traditional students (Chen & Hossler), students

identifying as Black/African American or Hispanic/Latino/a (Chen & DesJardins, 2010; St. John, 2001), students from low-income backgrounds (Dowd & Coury, 2006), and community college students (Chen & Hossler; Dowd & Coury). These findings suggest the potential efficacy of expanding the federal, state, and institutional need-based grant programs such that loans constitute a smaller proportion of students' funding packages. At the state level, incentivizing lower tuition by increasing appropriations to public colleges and universities may be an effective alternative. That said, loans are a much less expensive option for the federal government in particular, and thus an indispensable policy option in an era of fiscal challenges (Long, 2008; Scott-Clayton, 2015). Perhaps the optimal strategy might be careful design and targeting of grant programs such that they eliminate all or most of the need for loans among the lowest income students, while maintaining availability of federal loans for middle-income students.

Additionally, policymakers might address some of the information challenges in the financial aid system, and especially within the student loan system, that serve as barriers to both access and persistence. Long (2008) notes that navigating the loan system presents additional challenges beyond the general financial aid system because of the opaque application process, unfamiliar terminology, and unclear risk. Policymakers might consider simplifying the eligibility process, especially given that student loans have a less-stringent means test than do Pell Grants. It might also be helpful to freeze an individual's interest rates at the time of the first loan; presently, although interest loans are fixed at the time of the loan, they can vary from loan to loan, increasing uncertainty, especially for more risk-averse students. A similar strategy might be to establish income-based repayment as the default payment plan rather than providing new borrowers with a list of repayment options that might be available to them sometime in the indeterminate future. In short, eliminating such variables in favor of the most cost effective

borrower-friendly options may reduce some of the uncertainty and increase the effectiveness of the student loan program.

Directions for Future Research on Student Loans

Although there is a substantial amount of literature on the relationship between financial aid and persistence, far fewer studies have specifically examined the role of loans in this process. Within the extant literature on student loans, there is great variation in methods, samples, and findings. Lack of clarity on the role of student loans in the persistence process is problematic given their prevalence and long-term trend of growth. Our understanding of the relationship between student loans and persistence would thus benefit simply from additional studies examining loans and persistence. Such studies should employ both institutional samples, which often provide the greater detail necessary to facilitate longitudinal analysis, and larger state and national samples that lend themselves to more generalizable results.

Beyond simply adding to the relatively small body of literature on student loans and persistence, researchers must address previously understudied questions about student loans. For example, much less is known about the effects of loans for students from some underserved populations, especially non-traditional students and community college students, than about others (Chen & Hossler, 2017; Hossler, Ziskin, Gross, Kim, & Cekic, 2009). Similarly, few studies have examined differences between subsidized and unsubsidized federal loans, and even fewer have examined the federal Perkins Loan Program or private loans (Mayhew et al., 2016). The federal student loan program and other financial aid programs have also changed frequently, and will likely continue to change, and studying these variations is also important.

Regardless of the specific question, future studies should continue to employ some of the emerging methodological techniques that have greater potential for addressing selection bias and

other confounding influences. Recent research has favored quasi-experimental methods, but additional studies are essential to building the body of knowledge on student loans and perhaps disentangling some of the mixed findings. Replication and corroboration of quasi-experimental studies are especially vital given that the soundness of such techniques often relies on logical arguments about, for example, what constitutes an appropriate instrumental variable. Similarly, given evidence that the relationship between loans and persistence may change over time, and the tendency for cross-sectional and longitudinal studies to yield conflicting results, researchers should also strive to design longitudinal analyses that more accurately represent student experiences (Chen, 2008).

Another research design consideration is the need to disaggregate findings by income and race/ethnicity. The literature is relatively clear that students differing on these characteristics likely respond to loans and other financial aid and price considerations differently (Chen, 2008; Goldrick-Rab, Harris, & Trostel, 2009). This suggests that simply including income or race/ethnicity as “control” variables may not adequately represent the relationship between these characteristics, loans, and persistence. Estimating separate models for students with these different characteristics should be a default design in financial aid research.

Most importantly, researchers must view financial aid, regardless of type, as only one factor in a complex process. Empirical research and theory has identified a host of other factors that simultaneously influence persistence, including personal characteristics, academic preparation, college experiences, and external pulls (Mayhew et al., 2016; Melguizo, 2011). At a minimum, this suggests the need to draw on multiple theoretical perspectives and consider the role of a variety of covariates when attempting to isolate the relationship between a specific intervention, such as student loans, and persistence. Some researchers have even characterized

financial aid as a prerequisite for persistence but not a mechanism for increasing attainment, as long as aid is sufficient (e.g., Goldrick-Rab, Harris, & Trostel, 2009). It may thus be best to understand the role of student loans and other forms of financial aid as only one factor in a complex process rather than expecting them to have specific, distinct effect.

Considerations for Other Persistence and Attainment Research

The findings presented here also have implications for researchers examining persistence and attainment without a specific focus on financial aid. Researchers often operationalize financial aid variables as control variables in their models, and findings on the relationship between student loans and attainment suggest optimal approaches for doing so. Researchers incorporating financial aid variables in this way should be clear about why they are including these variables and what they intend to measure. Specifically, it is vital to distinguish among the role of financial aid variables as proxies for income or socioeconomic status, as interventions designed to promote persistence, and as part of a set of measures of the costs of college. Such constructs may differ in the way in which they influence the persistence process. Selection bias may also occur in different ways depending on the measure and the purpose, and researchers must identify and address those specific instances in which selection bias may skew results.

Still, while several different measure of financial aid may be appropriate, one that is not appropriate is a simple dichotomous variable indicating whether a student received any financial aid. Many studies have identified differences in the way in which grants, loans, and other types of financial aid each affect persistence, and a simple aggregate variable may mask these differences (e.g., Cabrera, Nora, & Castaneda, 1993; DesJardins & McCall, 2010; St. John, 2001). Treating federal subsidized, federal unsubsidized, and private loans as an aggregate variable may likewise yield misleading, or at least less nuanced, results. Researchers might

consider operationalizing financial aid in terms of amounts of each type instead of as dichotomous indicators. Amounts may be particularly relevant for operationalizing student loans; it would not be surprising if loans had a beneficial effect up to a certain amount, but then became too burdensome such that the costs outweighed the benefits. Finally, some researchers have recommended that models include multiple measures of costs and financial aid, including tuition, total cost of attendance, types of aid, amounts of aid, or measures of unmet need, as each may contribute to the overall effects of cost on persistence and attainment (e.g., Cabrera, Nora, & Castaneda; Mayhew et al., 2016; Paulsen & St. John, 2002).

Conclusion

Do student loans promote or hinder college persistence and attainment? Perhaps the best answer is “it depends.” Different student populations appear to respond differently to loans, and variations in total costs and overall financial aid packages may further moderate these responses. Time also appears to be an important factor in determining the relationship between student loans and attainment, perhaps because it is correlated to cumulative student loan debt. Above all, it is imperative to view student loans as only one variable in the complex and perhaps even individually unique process of persistence.

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