

Why Financial Aid Matters (or Does Not) for College Success: Toward a New Interdisciplinary Perspective

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Introduction

Economic and social success in American life increasingly requires a college degree. Fourteen percent of children from poor families may reach the top 40% of the income distribution if they do not earn a college degree, but holding a bachelor's degree nearly triples (to 41%) their chances of attaining that goal (Haskins, 2008).¹ Despite substantial investments on the part of federal and state governments over the last 60 years, family income and college attainment are more closely linked than ever (Ellwood and Kane, 2000; Haveman and Smeeding, 2006). Today, within the relatively advantaged group of high school graduates going on to college, there is a 40-percentage-point gap in the bachelor's degree completion rates of individuals from the bottom and top income quartiles (Haveman and Wilson, 2007; Kurlaender et al., 2007).

The persistence of such disparities despite nearly \$100 billion of annual investments in need-based aid raises some obvious questions about the value of that spending. Does it mean that financial aid is ineffective, or that other factors are responsible for lower levels of college attainment among poor children? Historically, the role of money in educational decision-making has been relatively muted in much higher education research. For example, Vincent Tinto's (1987) widely known theory explaining college success – an interactionalist approach to student departure – initially omitted finances altogether as a factor influencing whether students finished college, since the initial decision to attend was made and therefore it appeared that financial need was met. In a revision of his model, Tinto (1993) integrated finances into the initial adjustment into college and yet, as others have noted, this was not embraced by many of those using Tinto's perspective, who continue to omit finances when considering the factors that might predict completion (St. John et al., 2000).

Other researchers frame the issue as a debate with only two sides. For example, in an essay asking “Do we really have a college access problem?” influential education

¹Here, being poor means having an income in the bottom 20% of the overall distribution.

researcher Clifford Adelman (2007) writes of money “as the easy part” and points to inadequate high school preparation as the root cause of disparities in access. While recognizing the interactions between family income and academic preparation (describing them as “synergistic”), and expressing support for increasing the maximum Pell grant, Adelman places substantial emphasis on an “achievement template” that “almost ensures” college persistence. While he is correct that more than 90% of students who fit his template finish college, regardless of family background, an important question remains about what can and should be done to improve academic preparation for low-income students or to make up for the absence of preparation in other ways, such as financial aid.

An alternative economic approach is to compare the costs and benefits of different programs. For example, are there programs at the K–12 level that could improve academic preparation for low-income students at a reasonable cost, or would increasing financial aid be a more effective approach? By this logic, the debate about financial aid versus academic background requires a comparison of financial aid with specific programs aimed at improving preparation at the K–12 level (Harris forthcoming-a). Certainly, Adelman partly recognizes this and mentions “pre-collegiate advisory, motivational, mentoring, and tutorial” programs, but he acknowledges that there is no evidence that these are more cost-effective than financial aid (2007, p. 51). We argue that it is unproductive to contend that academic background is the central factor or “predictor” without first identifying programs that have proven success in changing that predictor. In other words, the fact that academic background is the strongest predictor of college success is far from sufficient to guide policy decisions about financial aid, or even preparation itself.² Further, although money may be “the easy part,” state and federal policies have actually done much less than commonly believed to address financial inequities in college success.

Using evidence to guide policy decisions requires careful attention to the difficulties of identifying the causal impacts of programs, which is critical for making legitimate comparisons across programs. Later in this chapter, we discuss the challenges of identifying causal impacts of financial aid and summarize the studies that have been best able to address these difficulties. In short, it is difficult to separate the role of factors influencing eligibility for aid (especially family income) from the impact of aid itself. A simple correlation between aid receipt and college success is likely to be negative because students from low-income families, in the absence of aid, are for a variety of reasons less likely to succeed. Unless researchers can convincingly account for all of those reasons – and we argue that very few do – the estimated effects of aid are likely to look smaller than they really are.

While the role of financial aid in promoting college attainment has been given short shrift in many well-known studies, and many statistical estimates of the effects of aid are less sound than they need to be, a review of the existing evidence

²As St. John puts it, “hundreds of thousands of low-income, college-prepared students are left behind each year, unable to go to 4-year colleges because they cannot afford to attend” (2006, p. 1604).

reveals that the most rigorous studies indicate a significant positive impact of aid (there are a few exceptions, e.g., Stinebrickner and Stinebrickner, 2004; Herzog, 2008). Moreover, there is a general consensus that financial aid *should* positively affect college success. Therefore, central to any future higher education policy agenda is the need for a clear and thorough understanding of precisely how and why financial aid affects student behaviors and outcomes. What are the mechanisms through which aid exerts its effects? Is the impact direct, such that simply by lowering the cost of college more students will finish a degree? Or is the effect largely indirect, via effects on time spent working or studying? Equally important, are the impacts of financial aid the same for all students and if not, why? Prior research indicates some important differential effects, including those by race and gender, yet existing studies are unable to account for those effects. Closing substantial achievement gaps in college completion requires much more knowledge about the effectiveness of aid in that effort.

All of these questions, regarding *why* financial aid should affect college success, lack solid empirical answers. We partly attribute this to insufficient theorizing, and partly to insufficient testing of existing theories. In this chapter, we contribute to a new agenda in financial aid research by exploring and building upon several theories about college success and their predictions about how aid should impact (or fail to impact) that outcome. We discuss the common theories in the next section and then, after the discussion of existing rigorous evidence, present several new concepts drawn from the social sciences which might explain other types of financial and life decisions and therefore might help explain and improve upon the limitations in existing theories.

First, we consider variations in the basic human capital theory, such as aversion to risk, short time horizons, heterogeneity in disposition toward work, compounding effects in the accumulation of skill, heterogeneity in the expected monetary return to college, and imperfect information. We also draw on work from behavioral economics that emphasizes aversion to losses and to ambiguity (distinct from aversion to risk) and on work from economic psychology. Finally, we use theory and evidence from sociology about relative risk aversion, the social meaning of money, the centrality of work, the advantages and disadvantages of strong social ties, and the transition to adulthood. Overall, by combining the most rigorous evidence with the most recent advances in social science theory, we hope to create a richer understanding of how aid works that can be used to design more effective aid policies.

Common Theories About the Impacts of Financial Aid

Since aid is a financial intervention, researchers often approach it from the perspective of the standard economic model, under the labels of human capital and net price theory. However, as we will illustrate, this model does not explain certain anomalies in empirical research and this has led researchers to propose other types of models.

Human Capital Theory

The application of human capital theory (Becker, 1975) to financial aid and tuition is discussed at length in prior research (for a thorough, recent review see DesJardins and Toutkoushian, 2006). The basic model assumes that people behave rationally and are well informed about their choices. While people might not be able to predict perfectly the costs and benefits of a college degree, they are assumed able to form unbiased expectations about what will happen under each scenario and therefore make choices that maximize their expected happiness, or “utility,” accumulated over time. Because individuals tend to prefer more immediate gratification, they maximize the expected present discounted value of utility, so that future benefits and costs are reduced in value (or discounted) for decision-making purposes.

In this model, utility is generated by leisure (i.e., nonwork time) and consumption (i.e., products and services), and leisure is determined by the amount of time spent working – which generates income and therefore consumption. These relationships create a clear trade-off between consumption and leisure. They also mean that the direct costs of attending college (e.g., tuition, fees, room and board) are not the only costs – the time spent studying rather than engaged in paid work or leisure creates an “opportunity cost.” In the basic version of the human capital model, the benefit from college is the higher wages that employers pay college-educated workers. By sacrificing short-term income, individuals with college degrees can increase their consumption and/or leisure in the future.

An important implication of this simple version of the human capital model is that students from low-income families enjoy just as much access to college as anyone else. Certainly by definition they have less money to start with (i.e., smaller “endowments”), but the basic model also assumes that capital markets work perfectly so that students can borrow money to pay for college. Their incentives to invest are not smaller than those for students with larger endowments, since wealthier students forgo the interest earnings they would have accrued if they had invested their money in other ways rather than spend it on college. In the basic theory, the interest rates received by the wealthy and paid by low-income borrowers are the same – therefore the total real cost of college education is also the same for both groups. Thus, in this framework, the decision to attend college depends solely on the expected return to college compared to the interest rate on borrowing and saving, both of which are assumed to be independent of family income.

Why then do so many young people, particularly those from low-income families, attend college and why are failure rates among college-goers so high? Literally hundreds of studies have demonstrated a substantial economic payoff to a college credential (for reviews of this literature, see Ashenfelter et al., 1999; Card, 1999; Harmon et al., 2003; Psacharopoulos and Patrinos, 2004). The American evidence suggests an average real rate of return of about 10%, although there is variation in the estimates (several percentage points) across different

econometric specifications.³ Few investments, if any, can systematically match the average return to a college education.

Moreover, financial reward is certainly not the only reason for going to college. There are numerous benefits from a college education other than money, and for many students, the value of the expected nonmonetary benefits could easily exceed the expected financial benefits. Research quantifying many of these nonmarket effects from education have been summarized in several excellent surveys (examples include Haveman and Wolfe, 1984; Cohn and Geske, 1992; Wolfe and Haveman, 2001, 2003; Baum and Payea, 2004; Grossman, 2006). Following the categorization of Wolfe and Haveman (2001, 2003), some of the private nonmonetary benefits of education (as opposed to broader social “spillover” benefits to others) documented in the literature include: higher nonwage remuneration (i.e., better fringe benefits and working conditions), improved intrafamily productivity (i.e., spouse’s education has a positive effect on the other’s earnings independent of marriage selectivity), children’s greater cognitive development and education attainment, better children’s health, lower rates of teenage pregnancy better own health (including mental health and life expectancy), better spouse’s health (including life expectancy), improved efficiency in consumer decision making, improved efficiency in job searching, better marriage matches, and more likely attainment of desired family size. In addition, Blanchflower and Oswald (2004) find that education has a positive effect on happiness and life satisfaction (independent of its effect through income). Given this laundry list of private benefits from education, the average total return to education is almost certainly much larger than the average real monetary return of about 10%.

But problem with the basic human capital model is that several of its assumptions fail to hold. First, it assumes that the costs of college are the same for all students. Much evidence indicates this is not the case. For example, wealthy parents may place pressure on their children and are likely to give them more money if they go to college—creating a financial incentive in much the same way that a higher salary would. In addition, it is clear that low-income students cannot borrow at the same rate that wealthy students can invest. One reason for this is that human capital is

³A central concern in studies about the return to education is the issue of causation. Simply put, the correlation between education and earnings does not necessarily mean that greater education creates greater earnings. More able individuals may progress further in schooling and have higher earnings independent of their higher schooling. Thus, there is a potential omitted-variables bias (frequently referred to as “ability bias” in this context), and the ordinary (multivariate) correlation between education and earnings may overstate the causal effect of education. This issue has been at the forefront of the returns-to-education literature practically from its inception. Despite the plausibility of the ability-bias hypothesis, the evidence generally indicates that the ordinary (multivariate) correlation is not misleading about the causal effect of education. Griliches (1977) first summarized this issue and concluded that the bias in the ordinary correlation is either nil or negative (i.e., the estimated return understates the causal effect of education). Research since then, summarized by Card (1999, 2001), has only reinforced this conclusion. The small positive bias from omitted ability appears to be roughly offset by a small negative attenuation bias from errors in measured education.

different than other forms of capital (e.g., buildings and machines) in that the capital itself (labor) cannot be held as collateral, increasing the risk to the lender that the loan will not be paid back. In other words, if students borrow money to finance their education and do not repay it, the lender cannot reclaim the “education” that they received. This makes lending to finance education riskier, and is partly why the discussion of credit constraints – a topic we return to later – has played such a significant role in the debate over financial aid.

Another way in which the costs of college-going differ by family income is that low-income students are, on average, less academically prepared for college than otherwise comparable but wealthier students (Nora and Rendon, 1990; Gamoran et al., 1997; Cabrera and La Nasa, 2000, 2001; Cabrera et al., 2003). Less than one third of high school students from disadvantaged socioeconomic backgrounds complete the minimum academic requirements for college (Walpole, 2008). In poor urban school districts, the numbers are even more dismal; one longitudinal study of Chicago public school (CPS) students revealed that only 9% of CPS graduates “had sustained exposure to rigorous coursework that ... prepare[d] students for college-level work” (Roderick et al., 2006). Even if they are able to get into college despite poor academic preparation, these students therefore have to put forth greater effort to obtain the same grades. In the process, they also incur what economists call “psychic” or “psychological” costs – the frustration and strain of having to sit through lectures and do readings that are hard to comprehend. The fact that academic preparation explains a lot of the variation in college success (Adelman, 1999, 2006) may be partly attributable to the larger psychological costs incurred by less well-prepared students. It may also therefore explain why low-income students are less likely to enter and graduate from college.

We should note, however, that while there are limitations of human capital theory, its main prediction in the present context – that reducing the financial cost will make students more likely to attend and finish college – is supported by the most rigorous research evidence (see the later summary of evidence). This is also the main prediction laid out by researchers such as Leslie and Brinkman (1987) in what has come to be known as “net price theory.” An important difference, however, is that net price theory focuses only on the direct costs of college and neglects other, arguably more important, costs. First, much of the total cost of college involves the opportunity cost of working fewer hours and earning less income during the college years. College takes time, and time is money. In 2006, high school graduates between the ages of 19–22, with no college experience and working full time (at least 40 hours per week) earned an average of \$22,903 annually (calculated from the Current Population Survey). This is close to three times higher than the 2006/07 average full-time tuition and fees of \$8,055 (\$4,101 at in-state public institutions – both figures are from the U.S. Department of Education’s 2007 *Digest of Education Statistics*, Table 320). This opportunity cost to tuition ratio of 2.84:1 suggests that reducing tuition by 10% would only reduce the total cost of college-going by 3.5% (1.8% in the case of public institutions only). This partly explains why changes in tuition and aid typically have smaller impacts than one might expect – and why large changes in tuition and aid might be necessary to generate significant changes in college attendance and graduation.

Since we have focused on financial considerations to this point, it is worth returning to the discussion of earlier theories about college success that gave either no role or a much smaller role to finances. As we have shown, there are good reasons to expect that financial aid generally improves college success and we will show later that empirical evidence supports this conclusion. Thus, we take issue with the many models of student success that minimize or omit aid and college costs more generally. There is also misunderstanding about why aid might matter. While the focus of debate tends to be on helping students pay the direct costs of college, these may account for a very small proportion of the costs and dilemmas that students face. While many scholars have recognized these other costs, and have pointed out that they are hard for policymakers to control, the debate misses the fact that financial aid may help to offset these other costs and make college a more desirable proposition, even for students who can already minimally afford it. This is important because it means that policymakers can indirectly address problems that are outside their immediate control – and that it is misleading to say that the problem of college success is “not about the money.”

Human Capital Theory and Types of Aid

The standard human capital model also informs how different types of aid impact student outcomes. In some ways, we might expect loans to exert only a small influence on student behavior. The basic human capital model assumes that students have full access to credit and make college decisions to maximize the net present value of their lifetime income. With credit imperfections, though, a small increase in net price can lead to a large response in educational attainment by making it impossible to make beneficial human capital investments (e.g., Cameron and Taber, 2004). Therefore, for someone with access to few resources, a relatively small loan can make a big difference on college decisions.

On the other hand, unlike grants, loans must be repaid with interest. This means that they are not worth as much to the borrower as implied by their stated value. This is the motivation behind programs that replace loans with grants. Consider a student receiving a \$3,500 grant to cover college-related costs. If he could put the money (\$3,500) in the bank to earn 4% interest, then 10 years later he would have \$5,181 (principal plus interest). In contrast, a student who took a \$3,500 loan at 6% interest and put the money in the bank at 4% interest would end up owing \$1,087 (because the loan principal would have to be repaid and he would be paying a higher interest rate to the lender than he/she would be receiving from the bank). The point here is that students are much better off with a grant – in the example, \$6,268 better off to be exact. For the same reason, Kane (2001a) reports that a dollar of support for the federal Pell grant program costs the government roughly six times more than an additional dollar of eligibility for the Stafford loan program. Because students pay back loans, the government really only pays the interest subsidy, interest and principal on loans of students who default, and the costs of administering the program. With loans, the government

contribution is small and so is the value to the student. For this reason, we would expect the measured impact of loans on college completion to be substantially smaller than that of grants. We discuss evidence regarding this and other hypotheses later.

Sociological and Psychological Explanations

Given the limitations of prominent economic models regarding how aid should work, it seems appropriate to turn to theories stemming from other social science disciplines. One prominent example of an attempt to integrate multiple disciplinary perspectives is the “financial nexus theory” developed by Paulsen and St. John (1997, 2002). According to their approach, the ability of financial aid to affect the decisions made by college students depends on the availability of aid and student *perceptions* of college costs. The primary purpose of financial nexus theory is to provide “insights into the ways students respond to student aid in different settings” (St. John et al., 2005, p. 547). Differences in the observed size of effects of aid are explained by differences in how students initially perceived college costs. Researchers in higher education (including economists) have long recognized that information on both topics is widely available but unevenly received, but what distinguishes this from the economic model is the emphasis on perceptions. The federal application for aid is notoriously onerous and requires a high level of financial knowledge on the part of the applicant (Dynarski and Scott-Clayton, 2006). Students well connected to parents, peers, or others in the community with information on how to complete the form as well as knowledge of sources and amounts of assistance are more likely to receive aid and thus lower their net price. But the role of relationships and the information provided by social networks are generally overlooked in human capital theory.

Others have also emphasized the roles of cultural and social capital in shaping how students respond to prices and how those responses affect their decision making (e.g., Hossler et al., 1999; Berger, 2000). Similarly, Cabrera et al.’s (1990) “ability to pay” model seeks to account for financial factors which might moderate the adjustment of students to college. According to that model, students with a greater ability to pay for college become more integrated into college life, and are thus more likely to succeed.

Perna (2006) notes that disparities in the extent to which knowledge of college prices and aid affect college decisions are poorly accounted for in existing economic theories. Instead, she argues that an integrated model inclusive of human capital theory as well as cultural and social capital theories that recognizes “multiple layers of context influence an individual’s college-related decision-making” provides a better basis for understanding those disparities (p. 1621). In particular, she posits that both institutional practices and differences in familial relationships and students’ beliefs and dispositions contribute to information differentials among racial groups. It therefore follows that if all groups had access to the same information about aid, then aid would exert the same impact on all students.

Dowd’s (2008) thorough discussion of the state of financial aid research highlights many of the problems we raise here. In particular, she clearly recognizes the

need to move beyond rational choice models of decision making, since much evidence indicates that the model does not fit reality. She is especially concerned with the limitations on individuals' "capacity" to engage in rational choice processes, since that capacity is constrained by a lack of belief or confidence in the opportunities available. Therefore, Dowd points to the need to include assessments of students' "locus of control" and self-efficacy in relation to their decisions about financial aid, especially with regard to loan-taking. According to this model, those with stronger senses of self and correspondingly higher educational expectations ought to behave more like econometricians when making decisions. Dowd's hypothesis has not been empirically evaluated. However, we suspect that while controlling for "locus of control" might slightly reduce the differentials in aid's effects, it will not go far toward accounting for them. Simply put, Dowd's theoretical model still places a premium on the notion that a rational choice is identifiable and clear, if only individuals knew of-and believed in- it.

Each of these theories (e.g., those of Paulsen and St. John, 1997, 2002; Berger, 2000; Perna, 2006; Chen, 2008; Dowd, 2008) and several others have made substantial efforts to consider thoroughly how and why aid matters, and for whom. They have worked hard to draw on sociological conceptions of capital, and integrate them with economic understandings. But unfortunately, as we describe in the next section, none of these theories seems to explain the key anomalies that have arisen in empirical research.

Empirical Evidence on Aid Impacts

While we can make intuitive judgments about the plausibility of each theory just discussed, a basic scientific tenet is that theories should be tested through empirical observation. Next, we describe the difficulties in identifying causal impacts of financial aid, a requirement for testing any theory intended to inform policy or practice. First, we note two important limitations of both theory and research. While most educators recognize that students' responses to interventions vary, both theory and research on financial aid tends to focus on the average causal impact, neglecting the potential for heterogeneity in effects. Second, while policymakers are most interested in the long-term impacts of interventions with high costs – for example, college graduation rather than a single year of persistence – many of the empirical studies focus only on short-term outcomes, and theories tend to ignore any temporal differences in plausible effects.

The Methodological Challenge

Researchers have had great difficulty identifying causal effects of aid on college completion because there are many reasons to expect poor students to have lower rates of entry and persistence – from lower levels of parental education to inferior

elementary and secondary school preparation. Further, because the neediest students receive the most aid, it is difficult to separate the likely benefits of aid from the educational outcomes associated with being from a low-income family. This means that a simple correlation between student financial aid and persistence may substantially underestimate the true benefits of aid, and holding constant student financial background and other factors in a regression analysis is still likely to miss important, but unmeasured, ways that students differ (Dynarski, 2003; Cellini, 2008). This is why nonexperimental studies probably suffer from selection bias, which means that the usual estimated effects of need-based aid could be inaccurate (Curs and Singell, 2002; DesJardins et al., 2006; Alon, 2007; Cellini, 2008). As Alon notes:

On the one hand, the same factors that enhance need-based aid eligibility – such as economically disadvantaged family background – are negatively related to persistence and graduation. On the other hand, amounts of financial aid are expected to enhance persistence and graduation. Hence, the negative effect of need-based aid eligibility may mask the positive impact of aid quantity on college success. (2007, p. 297)

Omitted-variables bias is a common problem throughout financial aid research, and stems from limitations of both data sets and analytic techniques. As Edward St. John and his colleagues cogently describe in essays appearing in a volume of *Readings in Equal Education* (2004), the problem extends to analyses published by the National Center for Education Statistics, and the data sets they produce – which in turn, by virtue of their wide use, influence subsequent analyses. For example, the national data set most commonly used to study financial aid, the National Postsecondary Student Aid Study and its cousin the Beginning Postsecondary Study, contains relatively few measures of either high school academic preparation or college performance. On the other hand, the data set most often used to study college completion while accounting for high school preparation, the National Educational Longitudinal Study, lacks any reliable measures of financial aid. As a result, omitted variable bias is a common – but still insufficiently recognized – problem in nearly all analyses of the effects of academic preparation and financial aid which rely on National Center for Education Statistics (NCES) data (Becker, 2004; Heller, 2004).

For these reasons, then, it is difficult to have much faith in the conclusions of studies which claim to identify effects of financial aid by simply comparing the outcomes of recipients and nonrecipients, a common approach used in literally dozens of studies over the last several decades (for but a few examples see Cabrera et al., 1992, 1993; St. John et al., 1994; Kaltenbaugh et al., 1999; Hu and St. John, 2001; DesJardins et al., 2002). Many of the dominant theories of financial aid have been tested using this insufficient method.

Quasi-experimental methods can be (and often are) employed to attempt to address this problem, but even they are limited in their ability to support causal claims in general (Shadish et al., 2002) and specifically those about whether financial aid causes an effect on college graduation (Cellini, 2008). Randomization of aid recipients allows for more convincing estimates of the causal impacts of aid, which (as described earlier) addresses a significant limitation of past research. By using a lottery, researchers can create control and treatment groups that systematically differ

only in the receipt of aid. This therefore allows for greater confidence that any observable differences in outcomes between the two groups are caused by aid (Titus, 2007).

Of course, financial aid is a topic examined by literally hundreds of researchers in higher education and we are far from the first to attempt to advance understanding of how and why it exerts effects. What is more distinctive about this review is that we focus on the most rigorous studies and the unexplained anomalies that are important for the development of useful theories. Failure to address the selection-bias problem is due to the inherent difficulty of measuring the full range of important factors affecting college success and an apparent willingness among researchers to assume that the selection-bias problem is small. This is a critical point because it means that many studies, while widely cited, are insufficient to draw causal inferences or to make convincing policy recommendations. Therefore, below we focus our attention only on the most rigorous research and what it says about the various theories.

Main Empirical Findings

The prediction of the human capital theory – that more aid leads to increased college entry and completion – is generally supported by empirical evidence. Using national, state, and institutional samples, social scientists have used quasi-experimental methods or natural experiments to explore the impact of aid on college access and generally found positive and statistically significant effects (e.g., Light and Strayer, 2000; van der Klaauw, 2001; Bound and Turner, 2002; Seftor and Turner, 2002; Bettinger, 2004; Singell, 2004; Singell and Stater, 2006). Nearly all of these studies find that financial aid positively impacts college success. Kane notes: “[G]enerally, a \$1,000 difference in tuition is associated with a six percentage point difference in college attendance” (2001b, p. 65). A few have identified null or even negative impacts of aid on access, but these results have been attributed to model misspecification and lack of good aid measures (e.g., Somers, 1993; Kane, 1994; Alon, 2005; Pascarella and Terenzini, 2005). Seldom do researchers interpret null findings to mean that aid is simply ineffective as policy and not worthy of investment (one exception is Hansen, 1983).

Compared with effects on entry, there is considerably less evidence regarding the direct impact of aid on college completion, even though retention is an explicit goal of federal aid programs (Burgdorf and Kostka, 2006; Goldrick-Rab, 2007; Goldrick-Rab and Roksa, 2008) and researchers have long been interested in effects of aid on persistence (Astin and Cross, 1979; Iwai and Churchill, 1982; Jensen, 1981, 1984; Stampen and Cabrera, 1988; Voorhees, 1985). While fewer in number, the more rigorous studies suggest positive impacts. For example, Dynarski (2003) found that \$1,000 in aid increases first-year retention by 3.6 percentage points and the amount of education by 0.16 years. Singell (2004) found that a \$1,000 increase in aid was associated with a 1 to 5 percentage-point impact on yearly retention. Alon

(2007) came up with a similar estimate for the average student (1.5 percentage points), and Dynarski (2005) found that the Arkansas and Georgia Helping Outstanding Pupils Educationally (HOPE) scholarships increased the percentage of students who obtained bachelor's degrees in those states.

As others have noted, a random assignment experiment evaluating the impact of financial aid policy would greatly improve our knowledge on the subject (Kane, 2001b; Dynarski, 2002; Kurlaender et al., 2007; Cellini, 2008). Experimental evidence of this sort on the topic of financial aid is quite limited, however. Despite large federal investments, at the time of this writing the U.S. Department of Education has never funded a randomized experiment with financial aid.

But two small experimental trials of financial aid have been conducted. The first, conducted by MDRC, distributed \$2,000 grants to 264 older Black mothers on welfare attending two community colleges in New Orleans (Brock and Richburg-Hayes, 2006). Continued receipt of the "Opening Doors" grant was contingent on maintaining at least half-time enrollment and a C average; therefore, the grant was partly merit-based. Over a period of seven semesters, those receiving the grant exhibited higher rates of retention and slightly higher rates of credit attainment (earning on average three more credits than nonrecipients). An expansion of the Opening Doors grant program is now being replicated in New Mexico (one college), New York (two colleges), and Ohio (three colleges). An intermediary model will also be tested in California, where students can attend the college of their choice (Rimer, 2008).

The Student Achievement and Retention (STAR) demonstration project conducted at a large Canadian university involved randomly assigning merit-based financial aid and academic services (peer advising and facilitated study groups) to college freshmen (Angrist et al., 2007). The financial assistance was contingent upon achieving specific grade point averages and was set separately for each student depending on their high school grades. At the end of their second year, women who received both money and support services earned higher grades than women who received neither, but there were no effects on the academic performance of men.

Consistent with the possibility of credit constraints, potential students from low-socioeconomic-status (SES) backgrounds are generally significantly more responsive to net price than those from more affluent families, all else equal (for empirical evidence of this, see the literature surveys by Leslie and Brinkman, 1987 and Heller, 1997). As stressed by Hansen and Weisbrod (1969) and Hearn and Longanecker (1985), relatively more students from affluent backgrounds are likely to attend college without public support. Public support for students who would go to college anyway has no effect on access. Relatively more students from poor households are on the borderline of college attendance, hence, they are relatively more responsive to net price. Thus, a bigger return per public dollar can be expected for support targeted toward students from low-SES backgrounds.

There is some evidence that the composition of net price, and not just its level, affects college access. Specifically, student responses to equal amounts of tuition and financial aid are not the same, particularly for low-SES students. The

response to grants appears to be smaller than the response to tuition, although the evidence is somewhat mixed. Moreover, the response appears to differ among types of financial aid. In particular, the response to the federal Pell grant program is evidently smaller than for other forms of financial aid. Leslie and Brinkman (1987) and Dynarski and Scott-Clayton (2006) review this evidence. Dynarski and Scott-Clayton (2006) argue that the probable cause of this tentative conclusion is the complexity of federal financial aid formula. Students, particularly those from low-income backgrounds, may be relatively uninformed about financial aid in comparison to tuition. Another possible explanation is the way that the federal financial aid formula penalizes working students. The financial aid formula imposes a substantial “tax” on students’ earned income (the current formula for federal need-based aid implicitly imposes a 50% “tax rate” on earnings), thus reducing potential working students’ incentives to attend college compared to nonworking students. For every \$1,000 a student earns, her financial aid is reduced by \$500. Therefore, the financial gain of aid for working students is smaller than for nonworking students. Given this, a smaller response to federal financial aid than to tuition would not be surprising.

Consistent with human capital and net price theories, there is some evidence that need-based grants are more successful than loans in promoting persistence (Perna, 1998; DesJardins et al., 2002; Alon, 2007). One of the stronger tests of the effects of loans would be to evaluate what happens to student behavior when loans are replaced with grants. Some wealthy colleges have begun to substitute grants for loans (beginning in 1998 with Princeton University), but to date none of those programs have evaluated effects on college success.

There is substantial consensus that one of the primary difficulties with current financial aid policy is that it is poorly understood by nearly all of its constituents (Goldrick-Rab and Roksa, 2008). With the exception of the relatively small population of financial aid directors at colleges and universities, the vast majority of the general public does not know what opportunities for aid exist, how to access the various programs, and what one can expect to receive. Low-income parents and students are less likely to receive high-quality information about financial aid opportunities, and as a result are less likely to file a federal application for student aid or apply to more expensive colleges (which may, in fact, offer them a better financial aid package) (Long, 2008). Upper-income students receive information about college from a variety of sources, while low-income students rely on their high school counselors, largely because their parents and siblings did not attend college (Cabrera and La Nasa, 2000). As a result, students from poor families who would likely qualify for all or nearly all of the aid required to finance college fail to even apply, since they have limited access to information about how to apply for aid, little assistance in filling out the extraordinarily complex application, and substantial (and warranted) fears that college is unaffordable. Students from middle-class families who are insufficiently educated as to the variation in quality among college financing strategies and frustrated by the time-consuming nature of the application process, unwittingly take on high-interest private loans, credit cards, or off-campus employment without complete knowledge of the consequences. As a

result, children from socioeconomically disadvantaged families decide college is simply not possible for them, and subsequently count themselves out of opportunities (such as advanced placement courses) which could increase their chances of college admission and success (Cabrera and LaNasa, 2000).

Credit Constraints

The evidence on loans is related to the larger debate about credit constraints. The issue, from an economics perspective, is whether existing loan programs cover the direct costs of college – whether college is “affordable.” Most economists believe that students are not credit constrained in this sense (Dynarski and Scott-Clayton, 2006). Stinebrickner and Stinebrickner (2003, 2004, 2007), for example, study Berea College which charges no tuition and serves low-income students. Even in this extreme case of a near-zero price, the graduation rate during the time of their study (47%) was similar to the graduation of low-income students at other colleges (Horn and Berger, 2004), and there remained a relationship between income and college graduation. But the graduation rates at Berea began to outpace the national average in subsequent years: last year, it was nearly 60%, while the national average remained the same (Berea College, 2007). While far from conclusive, this evidence of the widening gap between the two suggests that borrowing constraints may have become more important predictors of degree completion as direct costs have grown (at colleges other than Berea). Further, even when attending a school where no tuition is charged, students still report that a lack of spending money provides an impetus to drop out of college (Stinebrickner and Stinebrickner, 2007).

Even if students are not credit constrained, however, this does not mean that financial aid is unimportant. As we argued earlier, financial aid can offset other perceived costs of college, e.g., the psychological costs of struggling through college. We point this out because the conclusion that credit constraints are absent is often – misleadingly – used to conclude that financial aid does not matter. The fact that evidence largely rejects credit constraints is entirely consistent with the evidence that increased aid leads to greater college success. The issue of credit constraints is only a very small piece of the larger aid debate, and the two issues should not be confused.

Differential Effects of Aid

One of the most central but poorly understood findings in higher education research is the greater sensitivity of minorities and women to financial aid. Numerous studies identify differential effects by race (e.g., Kane, 1994; Heller, 1998, 1999; Ellwood and Kane, 2000; Kim, 2004; Lisenmeier et al., 2006; Alon, 2007) and gender (Dynarski, 2005; Angrist et al., 2007), but very few offer much in way of explanation of those differences. Moreover, others have contrary evidence disputing the claim of racial differences (Cameron and Heckman, 2001; Cameron and Taber, 2004; Christian, 2007).

We illustrate the challenge presented by research into this area – ripe with unexplained anomalies – with a recent example. In 2005, St. John and his colleagues produced an empirical test of the power of nexus theory to explain racial differences in the effects of financial aid on semester to semester college persistence (St. John et al., 2005). Using National Postsecondary Student Aid Survey (NPSAS) data from 1987, the authors estimated a series of blocked or sequential logistic regression models separately for samples of African-American and White undergraduates. Their conclusions about the effects of financial aid, and in particular the differential effects of financial aid, are based on the results of this model, and comparisons of the size of estimated effects across the two models. They find a larger effect of grant aid for blacks than for whites (consistent with prior research – however, notably, that effect is *negative* in their study – an anomaly they do not account for). The authors interpret this evidence to mean that African-American students are particularly responsive to aid and therefore offer the policy suggestion that grant aid be increased because it has the potential to close racial gaps in achievement. Their recommendation is consistent with those offered by numerous other analysts.

But we identify several concerns with the design of the St. John et al.’s analysis and others like it. First, as discussed earlier, the authors do not estimate effects of aid in a way that could reasonably allow for causal inferences to be drawn. While they are careful to use the term “association,” they make policy recommendations that require these associations to represent causal impacts. Unobservable factors abound in the study – for example, as the authors admit, data limitations preclude the use of controls for high school grades or coursetaking, which other studies show predict college success (Adelman, 2006). This means that the impacts – including the difference in impacts between racial groups – cannot be interpreted as causal. Based on typical standards of evidence, a more reasonable interpretation of this evidence is that there is a significant selection-bias problem that creates a negative association and therefore the results cannot be used to draw conclusions about policy.

But most importantly, while financial nexus theory is supposed to explain why some students respond differently to financial aid, in fact no such explanations are offered by the actual empirical analysis. Of course, St. John and his colleagues are far from alone in finding challenges to explaining racial differences in aid’s effects. For example, while there is some evidence of variation in the economic returns to education (i.e., income gains attributable to education) by gender and race, it is too small to explain the large differences in responses to aid. Differences in the types of information about aid possessed by students may play a factor, but if that is the case it has not been well demonstrated (Perna, 2006). Finally, many studies have recognized the complexity of students’ responses to aid, noting that they seem to go beyond direct financial effects particularly for minority students, but have been unable to do much more than label these “intangible” or “unobservable” responses (e.g., Cabrera et al., 1993; Nora and Cabrera, 1996; Nora et al., 1996).

Our point here is that far too little is known about precisely *how and why* financial aid works, and especially how differential effects operate. This is not a case where what we already know is sufficient to inform policymakers. The many explanations proffered by higher education analysts today deserve serious and more rigorous

testing, and the possibility of additional and more powerful explanations must be explored. Therefore, below we discuss other branches of social science theory which we posit will help better explain existing empirical findings.

Toward a New Interdisciplinary Theory of How and Why Aid Matters

To get a sense of how students make decisions about college, and how aid might affect those decisions, it is important to consider evidence about other decisions that involve similar considerations. As it turns out, financial aid decisions are not the only ones in which results vary in ways not predicted by typical theories. For example, Beattie (2002) finds evidence of race, class, gender, and cognitive variation in the extent to which students use labor market information (specifically, returns to the college degree) to make educational decisions. That is, calculations made by “adolescent econometricians” vary widely, with only poor white men with low cognitive abilities acting as the human capital model would predict (Manski, 1993; Beattie, 2002). Since the decisions related to college also involve many of the same economic calculations, this finding may be applicable to financial aid. More importantly, this points to some limitations of the standard economic model in explaining some aspects of human behavior.

In this section, we build on earlier theories of the relationship between financial aid and college success by describing some more sophisticated notions of decision making posited by economists within the traditional economic model, as well as theory and evidence from behavioral economists and sociologists that challenge some of the main behavioral assumptions of the standard economic theory – in ways that are likely to apply to college students and explain variation in aid impacts. Figure 1 illustrates how the concepts we describe in the subsequent sections are intended to further elucidate empirical findings on the effects of financial aid to date. We focus primarily on factors that might account for unexplained differential effects of aid – these are what we call “moderators.” In some cases, we also introduce factors which could “mediate” average effects of aid. The model does not include the moderators and mediators typically included in financial aid research, as we take these as a starting point. Instead, the figure lists the factors typically omitted in studies of aid which – if included – we posit might reduce or eliminate differential effects.

Variations on Rational Choice Models

As described earlier, the simple human capital theory is based on calculations of the expected costs and economic return to college education and does not recognize differences among individuals or the general uncertainty involved when even well-informed people make educational decisions. Below, we consider a more nuanced

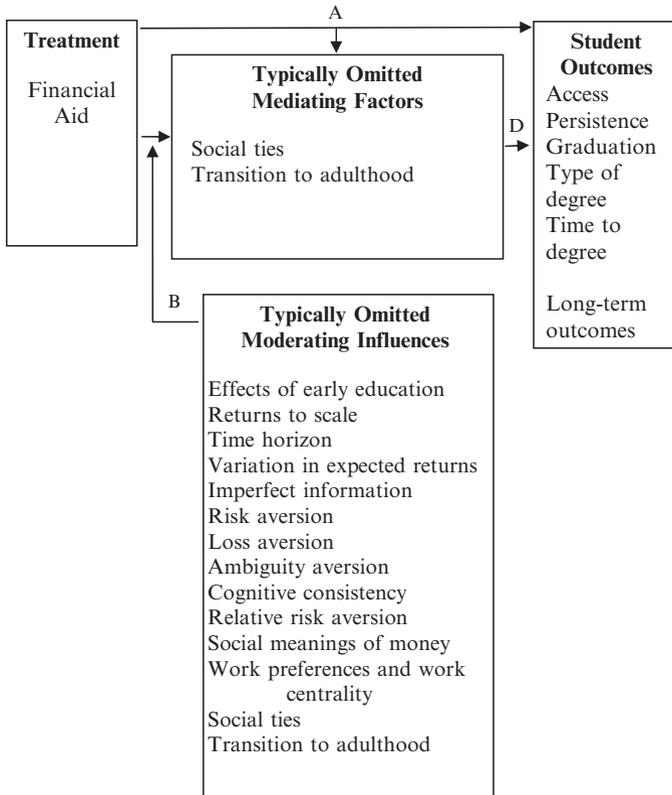


Fig. 1 Unexplained anomalies in financial aid research: A framework for investigation

economic theory that accounts for compounding effects in human capital production, and variation in how people value the future as much as they value the present (time horizon), risk-taking (risk aversion), preferences about work, expected return to college education, and access to important information about the benefits that education will provide them (imperfect information). We posit that students from low-income families, the primary target of aid, may differ along these dimensions.

Compounding Effects of Early Education

The more skills one learns, the easier it becomes to learn additional skills. In other words, human capital has a self-productive aspect. Furthermore, the impact of investment in human capital at a particular time in the life cycle affects – and is affected by – investments in human capital at other times in the life cycle. This “dynamic complementarity” in human capital investments is analogous to the “miracle of compound interest” with financial investments.

Initially formalized by Ben Porath in 1967, the compounding effect of human capital accumulation has essentially been taken as stylized fact in the literature for decades. However, particular attention has been placed on this compounding aspect of human capital in recent years (see especially, Carneiro and Heckman, 2003; Cunha et al., 2006; Cunha and Heckman, 2007a) with the growth of empirical evidence indicating the importance of early childhood experiences to later outcomes, such as academic performance, health, risky behaviors, education attainment, and success in the labor market. In particular, early childhood education programs targeted toward at-risk populations have been shown to generate substantial beneficial effects over time (for reviews of this literature see Barnett, 1995; Karoly et al., 1998; Currie, 2001; Blau and Currie, 2006; Cunha et al., 2006). The many positive later-life outcomes demonstrated by the randomized small-scale trials such as the Perry Preschool Program and Abecedarian Program have gained particular publicity (e.g., Belfield et al., 2006; Barnett and Masse, 2007).

Of particular interest here is the extent that precollege experiences influence the likelihood of college attendance. Most of the literature quantifying the effects of early childhood and adolescent interventions focuses on outcomes that indirectly affect the probability of going to college, such as achievement tests, grades, grade repetition, arrests, and high school completion. Those results generally point toward a substantial positive effect on college readiness and college-going; indeed, several studies have quantified a direct link between precollege interventions and college attendance. For example, by age 27, one third of graduates of the Perry Preschool Program had earned postsecondary education credits, compared to 28% of the control group (Schweinhart et al., 1993). In the Carolina Abecedarian project (another early childhood program), the treated group was almost three times as likely as the control group (36% versus 14%) to have attended a 4-year college by age 21 (Campbell et al., 2002).

Two studies have attempted to quantify the effect of Head Start (a long-standing federal program to promote school readiness) on college attendance. Oden et al. (2000) did not find a statistically significant effect at age 22, although the constructed control group was less disadvantaged than the treatment group. Garces et al. (2002), however, used a much larger sample of people between the ages of 18 and 30 and found a statistically significant effect of Head Start on college attendance. After controlling for family SES characteristics, participation in Head Start was estimated to raise the probability of college attendance by 7.5 to 9.2 percentage points.

An exceptionally large effect on college enrollment was found from the privately funded "I Have a Dream Program" that, along with providing various support services, promised sixth-grade students college scholarships to those graduating from high school (Kahne and Bailey, 1999). By the fall following scheduled high school graduation, 65% of the treatment group enrolled in college, more than three times more than the estimated 19% of the control group.

A significant positive effect on college enrollment was also found from Sponsor-a-Scholar, a privately funded program designed to encourage college preparation and attendance through mentorship and support services through high school and college, as well as some funding for college expenses (Johnson, 1999). In the year

following high school, 85% of the treatment group attended college, compared to 64% of the control group. The results of this program are notable in that it, unlike the other programs discussed here, was not targeted toward a disadvantaged population.

Finally, a positive influence on college enrollment was found in the Quantum Opportunities Program (Pilot) for disadvantaged youths entering high school (Hahn et al., 1994). Six months after scheduled high school graduation, 37% of the control group had attended college, compared to 14% of the control group. Moreover, this difference was even larger (57% versus 25%) two years after scheduled high school graduation (Lattimore et al., 1998). A similar but smaller impact on college enrollment was found in its successor, the Quantum Opportunity Program (Demonstration) (Schirm and Rodriguez-Planas, 2004). Within three years after scheduled high school graduation, 37% of the treatment group had attended college, compared to 30% of the control group.

While there is variation in the program designs, targets populations, and measured effects in the above studies, they all point at the same direction – toward the conclusion that precollege experiences are crucial for getting young people into college. Indeed, Carneiro and Heckman (2002, 2003), Cunha et al. (2006), and Cunha and Heckman (2007a) contend that precollege experiences are much more important barriers to college attendance than credit constraints.

However, there is also empirical evidence to indicate that the returns to early investments in human capital depend on the extent of later investments. In other words, the high apparent returns to early interventions are contingent on continued investments. An analogy is useful here: when riding a bike, while effort at the steepest part of the hill may be the most crucial, continued effort all the way up is needed to reach the summit. Even past the point where the slope starts becoming less steep, coasting and losing momentum can still lead to failure.

Therefore, it is probably not coincidental that the largest of the impacts on college attendance described above (from the I Have a Dream Program) had the longest intervention duration. Similarly, Barnett (1992), Lee and Loeb (1995), and Currie and Thomas (1995, 2000) found that the initial gains in academic achievement tests from participation in Head Start “faded out” in elementary school because the former Head Start participants generally attended poorer schools.⁴ It is sustained, rather than short-term, investments that create a compounding effect.

A variation on the idea of compounding effects is that students may have to reach a certain minimum level of education or achievement in order to get much or any return from further education. In other words, the main benefit to investments in primary and secondary education may be that they make it possible for some students to go on to higher education. Those who never go beyond a high school degree might not benefit at all compared to those who leave school. Several researchers studying the economic returns to education find evidence that is consistent with this idea (Card and Krueger, 1992; Heckman et al., 1996, 2006, 2008; Trostel, 2004, 2005).

⁴On the other hand, Garcés et al. (2002) find lasting effects from Head Start (as noted earlier).

Again to draw on the biking analogy, longer one delays getting to a particular height (for example of educational attainment) the steeper and harder the climb to the top. The time period to reap the return on investments in human capital is finite; thus, a long slow climb is not a rational option for those falling behind initially. Unfortunately, for some young people from disadvantaged backgrounds, the hill to a college degree may be quite steep.

Time Horizon

Economists theorize that students who have a long time horizon – those who give considerable weight in their thinking to their long-term well-being – are more likely to make investments with long-term payoffs. Higher education is just such an investment. In the short term, going to college requires spending time in class, which most students view as costly, and forgoing short-term consumption in order to pay for the cost of tuition and books. Instead of a new car or video game, students buy textbooks.

There is considerable evidence that time horizons vary, particularly by socioeconomic status. Lawrence (1991) shows that high-SES adults (those who are White and who have higher incomes) have longer time horizons. Specifically, high-SES adults evidently “discount” or reduce the value of future costs and benefits at a rate of 12% per year, whereas low-SES adults discount the future at a rate of 19% per year. Put differently, the time horizon of low-SES people is less than two thirds as long as high-SES people. These differences alone could explain the large differences in college outcomes between low- and high-SES students.

This could also explain some of the patterns in evidence about the impact of financial aid. If low-income students do have especially high discount rates, then the difference in impacts between grants and loans on decisions might be smaller than the earlier economic analysis suggested. Even though grants appear much more valuable, students with short time horizons might not attach much weight to the fact that loans have to be repaid – something that occurs far in the future. In effect, this means that the shorter time horizons of low-SES students reduce the distinction they see between grants and loans. For this reason, students might respond to grants and loans in ways more similar than what we would expect.

Work Preferences

According to many models, one intention of financial aid policy is to exert an indirect positive effect on college persistence by reducing rates of work among students (e.g., King, 2002). In other words, receiving aid is thought to change students’ time calculations, freeing them to study instead of work. More than three fourths (78%) of undergraduates work. Among working students, the average number of hours worked is 30, with more than one third of all undergraduates working 35 hours or more per week (McMillion, 2005). Alleviating the stress of the work–college

combination is said by some to be one of the primary psychosocial benefits of financial aid, according to a model developed by Nora et al. (2006).

Unfortunately, a causal effect of work in college on increased chances for degree completion is very difficult to estimate and has not been demonstrated, partly because of the same types of selection-bias problems noted earlier. It may be, for example, that those who choose to work simply have better time management skills, so that they are able to work with less stress than students who chose not to work. If time management skills are not measured, and if students with time management skills are more academically successful, then the apparent effect of working may really reflect an effect of time management. The fact that different studies address this better than others may explain why some studies find that students who work part time (up to 20 hours per week) exhibit higher rates of persistence than students who do not work (King, 2002; Pascarella and Terenzini, 2005), and others find just the opposite (Stinebrickner and Stinebrickner, 2003; Bozick, 2007; Staff and Mortimer, 2007).

In the standard human capital framework, work and college decisions are interdependent and many studies find that they are mutually reinforcing (Ghez and Becker, 1975; Blinder and Weiss, 1976; Ryder et al., 1976; Heckman, 1976; Weiss and Gronau, 1981; Killingsworth, 1983; Killingsworth and Heckman, 1986; Trostel and Walker, 2006). That is, the more human capital a student has, the greater his or her incentive to work, and, the more he or she intends to work, the greater his or her incentive to invest in human capital. Given the mutually reinforcing aspect of these decisions, a positive empirical correlation between education attainment and hours of work (especially after college) should be expected.⁵

Of course, it is hardly surprising that those with more education (doctors, lawyers, scientists, etc.) generally work more (longer hours, less likely to be unemployed, and more likely to retire later) than those with lower credentials. What is not typically appreciated in the literatures on human capital and college attendance is that work preferences may also have a strong influence on the incentives to acquire a college education. Those who are willing to work longer hours are likely to invest more in their education because they are more willing to work and reap the rewards.

In fact, there is a strong correlation between education attainment and work. Trostel and Walker (2006) estimated that for each year of education in the United States, average weekly hours of work are 1.35 higher for men (3.8% of mean weekly hours for men) and 2.36 higher for women (10.0% of mean weekly hours for women). The size of the correlation between hours of work and four years of schooling is substantial, and it is even larger for college years (rather than for all education years) (Trostel and Walker, 2004).

It is unclear whether students with stronger work preferences for work more during college. In the short term, students with strong preferences for work will want to

⁵The positive correlation between education and work is observed on both the intensive (hours per week conditional on working) and extensive (employment) margins, and in all extensive-margin dimensions (labor force participation, unemployment, and retirement). See Trostel and Walker (2006) and the references therein.

work more. However, looking at the long run, they might work less now to help ensure that they finish college and get a job that might produce longer working hours in the future. For this same reason, how the effect of aid varies by work preference is difficult to predict. But it is easy to see how this might be important in general, and we suspect that SES variation in work preferences do exist. Later in the chapter we discuss that variation in relation to the sociological concept of “work centrality.”

Variation in the expected returns

As discussed earlier, there is overwhelming evidence that investment in a college education pays off substantially, on average. Obviously this does not necessarily mean that college is a wise investment for all. Even if education produces human capital rather than indicating natural abilities, background and abilities may affect the expected return to college investments.

It is obvious to most that variation in the monetary return to education occurs – not everyone reaps the same reward for his or her college degree – and this is important because it means that the optimal investment for each individual also varies. What is far from obvious, however, is whether variation is due to heterogeneity in returns or uncertainty. In a recent series of papers, James Heckman and his colleagues devised an empirical strategy to identify the variation in the returns to college into the part that can be forecast before attending college (heterogeneity, i.e., variation in the expected return to college) from the part that cannot (uncertainty) (Carneiro et al., 2003; Cunha et al., 2005; Heckman et al., 2006; Cunha and Heckman, 2007b). Heckman and colleagues find that most (half or more) of the variation in the return to college education is attributable to variation in the expected return rather than to uncertainty.⁶ This is not to say that uncertainty about the return to a college education is unimportant, but rather that most of the observed variation in postcollege earnings can be anticipated even before college-going decisions are made. Moreover, there is considerable predictable variation in this return to a college education. Consequently, it appears that for many individuals, not going to college may be a rational decision, since the expected return evidently is not worth the cost.

That said, although there appears to be significant variation in the expected return to a college education, by itself it does not appear to be a sufficient explanation for why more young people do not make this highly profitable investment. Heckman et al. contend that high psychic costs of college-going provide the rest of the explanation – that

⁶To be more specific, Cunha et al. (2005) find that about 60% of the variation in the monetary return to a college degree is predictable (in various versions of this line of research the proportion ranges from 47% to 63%; see Cunha and Heckman, 2007b). Moreover, the average expected return to a 4-year degree for those going to college is 16% greater than the expected return to those not going to college. Nonetheless, the average *ex ante* financial return to a college education is still quite high for many high school graduates not going to college. For high school graduates not going to college, on average, a 4-year degree is expected to increase the present value (using an annual discount rate of 3%) of their lifetime earnings by 116%.

is, high school graduates not going on to college generally have high psychic costs of college attendance. Cunha et al. (2005, p. 243) argue that “psychic costs (including expectational forecast errors) are a sizeable component of the net return, and they explain why agents who face high gross returns do not go to college.” But for two reasons we are not entirely convinced that psychic costs are a sufficient explanation. First, this empirical approach imposes significant restrictions on preferences and market structures. While empirical testing thus far has found that relaxing some of those restrictions does not greatly affect the results, all potentially important factors have not yet been considered. For instance, perhaps heterogeneity in work preferences (as discussed above) is creating the appearance of heterogeneity in psychic costs and benefits. Second, the psychic-costs explanation begs the question of what causes the apparently substantial heterogeneity in psychic costs and benefits. One possibility, as we described earlier, is that students with weaker academic backgrounds have greater psychic costs and this may explain the empirical finding, emphasized by Adelman (1999, 2006), that academic background appears as a strong predictor of academic success.

Imperfect Information

As described earlier, the standard economic model also assumes that students have the information necessary to form accurate expectations about the costs and benefits of a college education. It is unlikely, though, that all students are reasonably informed about college costs and benefits. Indeed, there are evidences that they make significant errors in their expectations about both costs (e.g., Ikenberry and Hartle, 1998) and benefits (e.g., Betts, 1996; Dominitz and Manski, 1996). Moreover, for several reasons it seems likely that low-income youth are more likely to be less informed about college costs and benefits: they are less likely to go to college, and thus, it may be rational to spend less time and effort becoming informed about college; their parents are less likely to have gone to college and have experience of its costs and benefits; they are more likely to attend low-SES high schools and thus are less likely to learn about college from peers and counselors.

Despite the plausibility of this notion, there appears to be little evidence that low-income youth are more likely to be uninformed about the costs and benefits of a college education. Beattie (2002) provides some suggestive state-level evidence that is consistent with the notion that low-SES students underestimate the economic return to college education (we use the term “suggestive” because this macro-level evidence could be consistent with other explanations). But individual-level evidence does not support the hypothesis. Avery and Kane (2004) find evidence that students have relatively accurate estimates of the net economic return to education. Students tend to inflate the costs but this is offset by overestimation of the benefits in terms of future wages. Further, the net present value of college that they measured for students was not a strong predictor of students’ eventual decisions to attend college. Moreover, Grodsky and Jones (2006) find that the upward bias in students’ estimates of college costs is fairly uniform by race and family income, suggesting that this explanation could not explain the distinctive behavior of low-income students. Thus,

although the jury may still be out on this explanation for differential rates of college attendance across SES groups, most of the evidence suggests that this is relatively unimportant.

Risk Aversion

Information is also important in the sense that the costs, and even more so the benefits, of college occur far in the future and are therefore typically uncertain. Students might be able to make reasonably accurate calculations of the expected net present value of their decisions, but no one knows for sure what the actual net present value will be. Life is uncertain and so is the return to education (Carneiro et al., 2003; Cunha et al., 2005; Heckman et al., 2006; Cunha and Heckman, 2007b). In cases of uncertainty, economists theorize that decisions are affected by individuals' willingness or (unwillingness) to take risks – their “risk aversion.” Further, the expected net present value no longer becomes the sole relevant metric and the potential deviations from those expectations – or the extent to which the “average” effect does not apply to every person – become important. For example, consider a student deciding whether to go to college. If she decides not to attend (and instead has only a high school diploma) she knows that she is assured of earning \$30,000 per year. If on the other hand she goes to college, she realizes that while on average people get higher wages for holding a college degree (say, \$40,000 per year), but when considering her academic abilities, she feels less confident that she will actually finish a degree, and therefore after spending a year in college she would still only earn \$30,000 per year, the same amount she would have earned if she had chosen not to attend college at all. Moreover, she will have lost a year of income by spending time in college and will have to pay tuition and fees – making her worse off than if she had not attended at all. Therefore, even though the expected value of a college degree is positive (and she knows it), a risk-averse student might – rationally – choose to accept the guaranteed \$30,000 and forgo college rather than run the risk of losing a year of income and having to go into debt with college loans.

There is evidence that risk aversion is determined partly by the environment in which students are raised. Hryshko, Luengo-Prado, and Sorensen (2007) provide evidence from the Panel Study of Income Dynamics (PSID), measuring risk aversion based on a set of survey questions probing respondents' willingness to accept jobs with various combinations of income probabilities. Risk aversion is inferred from the answers to these questions and the composite risk-aversion measure is regressed on a variety of background variables. The authors find that the best demographic predictors of risk aversion are age, gender, and parents' education, as well as whether they lived with both parents when they were younger. Most importantly here, males and children of more educated parents are less risk-averse. In a study by Burdman (2005), one college administrator responsible for low-income students put it this way: “Those [non-college educated] parents are very leery about loans. ... Sometimes it filters down to a student” (p. 7). Interestingly, Hryshko et al. find

that income is not a predictor of risk aversion, though this is partly because parents' education and income are correlated; they do find a simple (negative) correlation between risk aversion as expected.⁷

Another study found that while some students come from high-income families, students generally tended to have low incomes and large debts with fairly high tolerance for debt and the longer a student was enrolled in college the less likely she or he was to be risk-averse (Davies and Lea, 1995). The increase in a student's debt load preceded a change in their feelings toward debt – more debt, more tolerance for debt. These along with other studies may explain why women were more responsive to grants in the Canadian STAR experiment (Angrist et al., 2007). Several studies have found women to be more risk-averse and therefore less likely than men to take out student loans (Davies and Lea, 1995; Hryshko et al., 2007). These findings are consistent with one another because loans increase the risk of college by making the long-term income levels more uncertain. Even if all students have the same expected economic returns to their educational investments, the fact that some students might be saddled with debt means that the downside for students with loans is larger and this may be a risk that some students – and apparently women in particular – are less willing to make.⁸ A grant such as the one in the Canadian experiment would enable women to complete college with less debt.

Research from Behavioral Economics and Economic Psychology

While the concepts discussed in the last section elaborate on, but do not substantially depart from, the standard economic model, recent research raises questions about the most fundamental assumption of that model – that people (including high school and college students) behave rationally and that their well-being now has no direct impact on their well-being later.⁹ As described by Weber and Dawes, behavioral economics applies lessons from psychology to take into account more ways in which “trajectories” influence individual decisions, writing that “how we get to the point of making a decision has almost as much of an effect on choice as the consequences of the decision” (2005, p. 101). Given the temporal dimensions of aid receipt and the effects of that receipt uncovered by others (see for example studies

⁷They also conclude that parental risk aversion is the strongest predictor, but they draw this conclusion by measuring parental income by observed variation in income, based on the assumption that more risk-averse people will choose career paths with more stable incomes. While this may be true, it does not account for the fact that parents' income volatility might impact the risk aversion of their children directly – they may want to avoid the variation in consumption they experienced as children, independent of whether parents themselves are risk-averse.

⁸Rouse (2004) finds that the expected earnings benefits of a college education are roughly the same across SES groups.

⁹The fact that preferences are influenced by family background is inconsistent with the standard model (see above), but the presence of risk aversion is entirely consistent with it.

conducted by DesJardins and his colleagues) attention to the role of trajectories and other less “rational” factors affecting decisions about financial aid is warranted. Therefore, we elaborate on these ideas in this section, drawing on two lines of research from behavioral economics and one from economic psychology.

Loss Aversion

In the last section, we discussed the role of “risk aversion” in decision making. But behavioral economists also find evidence that people are more averse to *losing* what they already have, compared to missing the *opportunity to add* to what they already have. This is known as “loss aversion” and might also be considered a bias toward the status quo.¹⁰

Loss aversion is typically assessed by asking people to respond to survey questions that pose different scenarios. For example, Thaler (1981) showed that the amount of money individuals require in order to accept a loss is greater than the amount they are willing to pay for an equivalent gain. In other studies, researchers have conducted experiments in which some participants are asked how much they would be willing to pay for small items such as coffee mugs, and other participants are given the mugs and then asked how much they would be willing to pay to give up the items. The latter amount turns out to be larger, consistent with the loss-aversion theory (Knetsch et al., 1984). In a similar test, evidence from financial markets suggests that people sell stocks whose values are rising too early and hold on to stocks they already own too long (Shefrin and Statman, 1985; Odean, 1998). Again, the loss-aversion theory suggests that this is because people hope that the declining values of their stocks will reverse so that they do not have to “take a loss.” In the context of student loans, the problem is that students who take loans face a chance that they will be in a worse situation than they already find themselves – that they will bear the cost of college without any benefit in earnings and will therefore lose some part of the lifestyle they already have. This is related to the sociological concept of thresholds and relative risk aversion, which we discuss later.

Ambiguity Aversion

As we discussed earlier, the expected monetary returns associated with a college degree are typically thought to induce people to attend and/or finish college and there is variation in the future returns that individuals will accrue. Further, some

¹⁰ Admittedly, the distinction between risk aversion and loss aversion is difficult to identify through observed behavior because many of the behavioral patterns are consistent between the two.

students may be unwilling to take a risk, for example, that there is a 50–50 chance they will earn no additional income by going to college. That unwillingness is what we described as “risk aversion.” But suppose students are uncertain about what the odds are, so that they cannot even make a clear calculation of their expected earnings. This could stem from a lack of awareness of the earnings distribution (due to a lack of information) or because of a sense that the known distribution will change over time (and is therefore unknown). This would make the distribution of the college premium uncertain, and an aversion to this uncertainty is known as “ambiguity aversion.”

How widespread is ambiguity aversion among today’s college students? Consider the evidence that some Americans believe that overeducation (or the production of too many college graduates) will result in declines in wage premiums (Freeman, 1976; Uchitelle, 1990). While academics largely conclude that such a scenario is unlikely, the public continues to believe it is possible (for the first point, see Rumberger, 1980; Smith, 1986; Tyler et al., 1995; Osterman, 2008). Indeed, resistance to an expansion in access to higher education may be partly grounded in this fear (Attewell and Lavin, 2007).

Given the probable relationships between socioeconomic background and the level of information children possess about both college and the rewards associated with college-going, we hypothesize that lower-SES individuals face more ambiguity. Financial aid may alleviate some of the fear of the unknown, and induce them to continue in school. In that case, ambiguity aversion, rather than some other aspect of socioeconomic status, could explain some of the observed SES differences in effects of financial aid.

Cognitive Consistency Theory

Coming from the related field of economic psychology, the concept of “attitude-behavior consistency” may also partly account for disparities in the effects of aid. According to this framework, people tend to want to be consistent in their actions, beliefs, and behaviors and they work to avoid inconsistencies, or a sense of inconsistency, in order to maintain cognitive coherence. For example, Davies and Lea (1995) describe students who are averse to taking on debt, but maintain consistency between that attitude and their behavior by not recognizing some forms of credit as incurring debt. Since in some religions and cultures debt is forbidden, a kind of cognitive dissonance or other adaptation may be necessary in order for students to accept loans. Therefore, students who define loans as something other than debt may be more willing to take the inherent risks of going to college and perhaps not getting a good job.¹¹

¹¹From an economic perspective, one reason is that students might view student loans as being an investment (in human capital) rather than debt per se.

Contributions from Sociological Theory

To date, two sociological concepts have been commonly used to inform financial aid research – “habitus” and “cultural capital.” Both draw on a theory of cultural re-production most closely associated with Pierre Bourdieu and are primarily intended to explain social class differences in college outcomes. More specifically, differences according to family income in both college access and completion, and income differences in the effects of financial aid, are said to be due to cultural differences between social classes (e.g., Perna, 2006). But while it is likely that such differences are important contributors to educational outcomes, an understanding of how and why financial aid exerts (or does not exert) effects on college students could benefit from several additional contributions from sociology. In this section, we discuss several such concepts, including relative risk aversion, work centrality, the social meaning of money, the strengths and weaknesses of social ties, and the transition to adulthood.

Relative Risk Aversion

Knowing something about individuals’ cost–benefit calculations is essential for interpreting their decisions. Rational choice theorists Richard Breen and John Goldthorpe (1997) set up a formal model of the college decision-making process that includes three alternatives (stay and succeed, stay and dropout, leave) and three possible work outcomes (underclass, working class, and service/professional class). They assume that students estimate their own (subjective) probability for the three outcomes, based on information they have about their own academic ability and the academic abilities of people in each of the three work classes. Further, because students coming from lower-class backgrounds also tend to have poorer academic preparation, they have lower subjective probabilities of reaching the highest-work class. Finally, the key premise of the Breen and Goldthorpe (1997) model is that risk aversion is rooted in thresholds that each class of individual sets for themselves – therefore, this is known as “relative” risk aversion. This is distinct from the form of risk aversion discussed earlier for reasons that become clearer below.

According to this theory, class differences in educational outcomes are attributable to “between-class variation in the necessity of pursuing education at branching points in order to avoid downward mobility” (van de Werfhorst and Hofstede, 2007, p. 391). Lower-class or working class individuals have lower thresholds because each group seeks to do at least as well as their parents and the parents of lower-class children have less education.¹² One corresponding implication is that lower-class

¹²This is not the only way that a threshold can arise. If students receiving aid are relatively similar to one another in their preferences and constraints, human capital theory implies a threshold effect, above which students will persist in school and below which they will not. However, given that students are probably not very similar, this theoretically possible scenario is not interesting.

individuals require higher subjective probabilities of reaching the working and service classes in order to justify staying in college. But it is important to point out that this model does not require lower-class individuals to be more risk-averse than the upper class in the sense discussed in the standard economic model – the implications of the model are driven by the different thresholds of the different classes.

A further elaboration of this model is found in Breen and Yaish (2006) who find some evidence to support the theory.¹³ Moreover, an interesting empirical test of the importance of relative risk aversion *compared to* cultural reproduction theories (including notions of habitus and cultural capital) in explaining educational inequality finds relative risk aversion to be substantially more powerful in explaining class variation in educational expectations (van de Werfhorst and Hofstede, 2007). As aspirations for higher levels of attainment – for example, the expectation of earning a BA – are known to be important predictors of college success, the role of relative risk aversion in college outcomes merits further investigation. Indeed, van de Werfhorst and Hofstede (2007) explicitly point to the need for a longitudinal analysis to test the effects of relative risk aversion at a point in time on later educational outcomes.

Social Meanings of Money

At its most basic, financial aid is usually thought of as simply money for college. Exchanges of money are typically conceived as grounded in rational calculations made by individuals about the costs and benefits of purchasing goods. But as economic sociologists have pointed out, this dispassionate view is overly simplistic, since it treats all monies as if they are alike, and as if their sole purpose is to facilitate consumption (Zelizer, 1994). It is theoretically improbable to suggest that all students think about money (and financial aid) in the same way, or that all forms of money are treated the same. Instead, ethnographic evidence indicates that students make important distinctions among different kinds of money, with some forms of money striking them as particularly “real” or serious (Clydesdale, 2007). As McDonough and Calderone (2006) note, decisions about money are often patterned after familial understandings of, and approaches to, finances. Families often differ in what they think they can afford, and for this reason some argue for tailored marketing of informational materials about financial aid (McDonough and Calderone, 2006).

¹³An important assumption of this model is, as Breen and Yaish (2006) write, “the returns to staying and failing do not strictly dominate those to leaving immediately” (p. 239). That is, it cannot be possible that both: (a) the probability of ending up in the service-class conditional on staying and failing is greater than the probability of ending up in the working class conditional on leaving; and (b) the probability of ending up in the working-class condition on staying and failing is greater than the probability of ending up in the working-class condition on leaving. It is not entirely clear whether this is realistic. While the returns to education are substantially lower for those who do not obtain degrees, the authors themselves point out, there is strong economic evidence of a substantial economic return to education for students who stay and fail. We are not aware of any cost–benefit calculations for these different scenarios.

One of the more consistent conclusions reached by those who have interviewed college students receiving aid is that they often do not think of loans as a form of financial aid (Rogers, 2006). This may be because students accurately perceive cash as different from credit, or perhaps because loans are less tangible than dollar bills. Another possibility is that receiving loans does not convey the same meaning to students as grants – for example, they do not provide (and are not) awards or gifts, and they come with ties. Each of these scenarios contradicts the standard economic model in which money is “fungible” and a dollar is a dollar no matter its source. Carruthers and Babb (1996) contend that money is most effective when it can be taken for granted – as in a grant. Receipt of aid is more than a monetary exchange, as it appears to convey a message between school and student about the value and esteem one holds for the other. Students who consider financial aid part of a bargain with a school, who recognize it as motivation intended to create an action (be it enrollment or persistence), should be more likely than others to respond strongly to that incentive. They should also be affected more when aid diminishes or is withdrawn. This might explain why the front-loading of financial aid (the practice of awarding more aid in early years of college) and the revision of aid packages from year to year based on changes in students’ circumstances would have significant impacts on students. It is not only that their resources diminish, but they perceive a “slight” on the part of the institution. For these reasons, students lose their financial aid may feel angry, and not just financially insecure.

Work Centrality

Earlier we introduced the concept of “work preferences,” and discussed the implications of differences in work attitudes for the effectiveness of financial incentives such as aid. In brief, those with a stronger preference to work may be more or less inclined to work during college which in turn affects their responses to financial aid. But variation in work attitudes is simply taken as given in the economic model. Therefore, sociologists have delved further, attempting to explain observable differences in work preferences.

What accounts for having a stronger or weaker preference to work? As pointed out earlier, one starting point lies in examining the interconnections between schooling and work decisions. Individuals planning to become more educated may choose to work more, and vice versa. But attention should also be paid to the value individuals place on working, or what some refer to as the “centrality” of work. Put simply, people have many reasons for working, some of which are not plainly economic. For example, ethnographic evidence indicates that some students elect to work in order to honor their family or culture, or because they have always worked (Weis, 1985; Mortimer, 2003).

For individuals for whom work is central to their lives, there is no reason *per se* to believe that they would stop working while in college, even if they were given enough financial aid. Indeed, the General Social Survey reveals that 70% of American adults say they would elect to continue to work even if given enough

money to live as comfortably as they would like – and this percentage has remained stable for the last 20 years (National Research Council, 1999, p. 50). It is not clear how much aid students would deem sufficient to stop working, or if any level of aid at all would change their decision. If work is central to the lives of students, serving to connect them to others and bring meaning to their lives, then it may well not be replaced with financial aid (Lobel, 1991; Feldman and Doeringhaus, 1992).

The hypothesis that aid will be used to reduce work also reflects an assumption that identification as a “full-time student” trumps other bases for forming identity. For example, the NPSAS asks student whether one is a “student working to meet expenses” or “an employee enrolled in school” – neither option allows for a student to work because they enjoy it or value it, or for a student to identify with his or her work but not as an “employee” per se. Yet responses to this question, which provides only two options, are used to interpret motivations for work. Instead, Landy and Conte write that “work is a defining characteristic of the way people gauge their value to society, their families, and themselves” (2007, p. 3).

Thus, both work preferences and work centrality could be an important part of the explanation why financial aid may not be as effective for some students. For which group of students might this be most important? The evidence is far from clear. On the one hand, high-SES students may be *more likely* than low-SES students to work while in college because they receive less financial aid yet still need money, or because low-SES students are more risk-averse – and view working while in school as risky. But it also may reflect the value high-SES students place on working, and the meaning they derive from it – and the ability of high-SES students to obtain a job even while in college via social connections. Evidence from the United Kingdom indicates that the introduction of fees there increased student work primarily among the more economically disadvantaged students (Metcalf, 2005).

The Strengths and Weaknesses of Social Ties

While aid is understood to affect individual expectations about the possibilities for finishing college, and Tinto’s (1993) interactionist theory places great importance on social integration into college; the way in which social ties could affect and be affected by the receipt of financial aid is inadequately understood. This is at least partly because all social ties tend to be conceived of (in higher education research) as positive. Certainly, it is the case that receiving additional financial support may lead students to live on campus or engage in extracurricular activities, where they may form new relationships (Nora and Cabrera, 1996). Many of the relationships and activities required for full social integration – including living on campus, attending parties, and participating in sports – necessitate financial resources. This is one reason why students from poor families are more likely to live off campus and forgo extracurricular activities (Christie et al., 2001). These students’ friendships are often forged outside college, in the workplace or home community (Levine and Nidiffer, 1996).

Harris (forthcoming-b), however, explains the many potential ways in which peers influence one another and the difficulty of identifying causal peer influences, including many that involve negative influences. If, for example, students identify with (or have strong relationships with) people who are “bad influences,” then the ties may make students worse off.

This “contagion” model applies to college peers (e.g., Argys and Rees, 2008) and to students who maintain close connections to friends from home. To some extent, Tinto recognizes this – his separation thesis contends that successful integration into college life requires a break from “family, the local high school, and local areas of residence” (1993, p. 95). Yet this theory has also been critiqued for being insensitive to racial and cultural differences in norms around separation from community (Tierney, 1992, 1999).

Similarly, while strong relationships with parents tend to be thought of as positive, Turley and Desmond (2008) draw on an analysis of data from the Texas Higher Education Opportunity Project to argue that positive parent–child relationships can be *detrimental* to the child’s chance of earning a college degree. Strong relationships are associated with an increased desire on the part of the child to live at home (so that the child can continue to contribute to family needs), which in turn increases their chances of enrolling at a neighborhood community college, rather than a 4-year school. The authors argue that this is particularly the case for Latino students.

While difficult to conceive as a “negative” effect, close ties with parents may compel some students to engage in financial reciprocity with their parents, thereby reducing their own available resources. For example, there is also some evidence that African-American college students contribute all or part of their work income, and financial aid, to help pay family expenses (Clydesdale, 2007). This kind of support serves to convey love and respect, but also allows students to command power in the familial home (Carruthers, 2005). For many reasons, then, it may be important to continue, even as it exerts a negative financial strain on students’ own lives.

A deeper understanding, then, of the social contexts underlying and surrounding students’ financial decisions in college must allow for the possibility that networks will have both positive and negative effects. This means, for example, that empirical results indicating that students receiving financial aid are more likely to socialize with peers should not, in and of itself, lead to the conclusion that aid has positive effects on social integration.

Transition to Adulthood

Models of financial aid tend to recognize differential responses according to race, gender, and family background, and also according to whether a student is older or younger. The literature on age is most clearly about how the rules of aid reduce help for independent adults, and how older students tend to have less information about aid (Rogers, 2006, 2008). But there is a different way that age can matter, which has to do with the transition to adulthood, a period in which individuals are

particularly vulnerable, uncertain, and unaware. Any theory that seeks to understand the effects of a policy on students aged 18–23 (at least) needs to pay careful attention to this development stage, especially now that age 30 is said to be “the new 20” (Hayford and Furstenberg, 2005). Often overlooked in aid research is the simultaneous adjustment students make to learning to manage their finances even as they learn to live on their own for the first time.

The effect of financial aid on students’ relationships with their parents should also be considered in the context of the transition to adulthood. It has become increasingly common for people in the traditional college-age bracket to mix school, employment, and even parenthood (Lorence and Mortimer, 1985; Johnson, 2001a, b, 2002; Johnson and Elder, 2002; Shanahan, 2000). Yet financial aid research too often overlooks the complex and simultaneous adjustments students make to learning to manage their finances even as they learn to live on their own. Indeed, in one survey, 39% of respondents aged 18–29 reported that they did not view themselves as adults, and among those who felt that way, one third said they “were not financially independent enough” to be an adult (Yelowitz, 2007). Contributing to the family income while in college may lead to a greater sense of independence, or instead it may increase the chances that a student will return to a parent’s home following college graduation, essentially a reversal of steps toward independence (Goldscheider and Goldscheider, 1994; Osgood et al., 2004) and reducing options that might generate a higher income.

Conclusion

A failure to account for group differences in responsiveness to aid is a primary shortcoming of existing research on financial aid, and compromises the explanatory power of our theories and models (Chen, 2008). Even more importantly, it suggests a broader misunderstanding about how and why students respond to aid and therefore how financial aid policies can be improved. Therefore, the purpose of this chapter was to identify, explore, and bring forth concepts from several social sciences disciplines that hold promise in terms of informing future theoretical developments in the field. Drawing in particular on the work of behavioral economists, and economic sociologists, we discussed concepts such as risk aversion and work centrality, which may serve to illuminate several unexplained anomalies in prior empirical research.

We also raise the issue of careful attention to causal inference in studies of financial aid. Our intent was to explain why the enormous number of studies on financial aid lack answers to many important questions. In short, these questions have been asked – just not sufficiently addressed.

Given that these theories and concepts appear to be useful in understanding financial and life decisions in other contexts, they also warrant empirical research in the context of financial aid where numerous unexplained anomalies remain. While it would be very useful to provide the concepts we have introduced with

some form of rank ordering for future research, based on their potential explanatory power, we have no empirical basis for doing this. Instead, the best test of our ideas requires a random assignment evaluation of a financial aid program, incorporating a longitudinal design with multimode data collection so as to delve more deeply into how students think about money, how they spend their time, and the contexts in which their decisions occur. Two of the authors of this article (Goldrick-Rab and Harris) are currently directing this kind of evaluation. The Wisconsin Scholars Longitudinal Study is tracking two cohorts of entering 2-year, technical, and 4-year college students for 6 years, and comparing the outcomes of students randomly selected to receive a private need-based grant (for more see www.finaidstudy.org). However, on a smaller level, many of these concepts could also be investigated further with qualitative interviews incorporating some experimentation usually only undertaken by behavioral economists and psychologists.

There are several additional areas in need of future research. First, attention needs to be paid to an array of supply-side factors affecting individual decision making. Effects of financial aid take place in a specific context, including a policy context, and aspects of that context are not captured in the model we have laid out (e.g., Titus, 2006). As one example, consider the sociological theory of maximally or effectively maintained inequality. While the underinvestment in higher education among students from poor families may be partly attributable to the lower levels of risk students face if they do not attend college, wealthier students may be motivated by more than just efforts to achieve the same levels of education as their parents. More specifically, some sociologists working in the stratification tradition hypothesize that the upper class is interested in achieving high thresholds of education attainment in order to maintain their class advantage.

Certainly, this is a variant on social reproduction theory. Even as educational opportunity expands, class inequalities in educational outcomes tend to be effectively or even maximally maintained since upper class students continue to seek higher and higher levels of education (Raftery and Hout, 1993; Lucas, 2001).¹⁴ Their ability to do so is hypothesized to at least partly result from the unintended consequences or corruption of policies seemingly intended to reduce or ameliorate economic disparities. Financial aid is one such policy. While originally intended to help close income differentials in college outcomes, recent shifts to merit criteria for the distribution of financial aid (e.g., witness the new federal Academic Competitiveness Grants) serve to exacerbate existing disparities (Heller, 2006). Analyses of shifts in the distribution of financial aid by family income over time in America reveal that during the 1990s students from families in the top-income quartile – not those in the bottom-income quartile – realized the greatest gains in aid receipt (the increase in proportion receiving aid was five percentage points for the poorest group and nearly 30 percentage points for the wealthiest group) (Choy, 2004). Similarly, as Hout (1996) notes, when the British government reduced the costs of higher education to nearly nothing, it was

¹⁴The level of inequality at a given level of schooling will only decline, according to this theory, when near universal access to that level is enjoyed.

the middle-class that took advantage. “The net result was that each class’ participation [after reforms] was in proportion to its participation prior to the reforms” (p. 304). These regressive trends highlight the way in which financial aid may affect the targeted group, but also not serve to reduce income differentials.

Any theory of how financial aid generates its impacts should seriously consider the plausibility of one of those impacts being a reduction in class differences in outcomes. As Breen and Yaish (2006) point out, the desire to attain a specific level of education appears to be predicated on wanting to maintain – or even better to exceed – one’s given level of social standing. Only when a level of education is saturated does inequality in that level begin to decline. Investments in financial aid, therefore, may well need to be coupled with other investments designed to increase (or control) educational expansion more broadly. For example, the failure to expand public university systems to keep pace with growth in enrollments, and the resulting bottleneck, provides motivation to constrict access and increase stratification among these institutions – such efforts can include keeping costs high. It can also result in higher rates of college dropout, as students unable to obtain the courses they need in a timely fashion decide to leave school entirely (Bound and Turner, 2006; Bound et al., 2007). In describing just such a scenario from Italy’s higher education system, Hout (1996) concludes that this explains why “an association between class origins and the probability of graduating from university emerged” (p. 308). He also notes that Ireland avoided such a result by expanding access to higher education more gradually (making entrance decisions based on test scores) while at the same time keeping costs very low. In other words, financial aid may only be effective in a context of controlled educational expansion, where opportunity can keep pace with demand and therefore aid is not accompanied by diminished resources and rationing.

Another area left for future research is the exploration of effects of financial aid on academic achievement, rather than simply attainment. There is a long-standing debate among sociologists of education regarding the value of credentials. The great fear is that the bar is simply being shifted, the goalposts adjusted, rendering a new credential simply that – a piece of paper. One way to think about differential effects of financial aid is to think about aid as accomplishing more than moving individuals from one educational transition to the next, but instead by potentially affecting their learning and achievement. There are numerous ways in which lowering the net price of attending college might change student learning. First, a contemporary example; differential tuition policies are making the choice of some majors more expensive than others. Under such a scenario, does the receipt of financial aid affect choice of college majors? If financial aid facilitates a better match between a student and his or her coursework, making college more enjoyable, it may well enhance both achievement *and* attainment. Similarly, by making it more possible to remain continuously enrolled in school, financial aid could affect the learning process. Students experiencing numerous disruptions in their coursework, for example, having to take a year of school off between levels of math courses, are not only more likely to end up leaving college, but are more likely to leave with an incoherent educational experience.

Therefore, the sociology of education points toward a need for analysis of financial aid that takes student learning, and not merely degree attainment, as an outcome of interest. Furthermore, the process of student learning ought to be considered as a mediator helping to explain differential effects of aid.

The future of financial aid, particularly need-based aid, is especially unclear at the current juncture. Federal, state, and institutional budgets are tight, and family resources are uncertain. Moreover, there has been a growing trend toward the use of limited resources to reward academic performance, rather than compensate for relative disadvantage. If these trends are to reverse, policymakers require substantial and compelling ammunition to support arguments for increases and/or reallocations in funding. The educational equity agenda therefore demands more careful and detailed research into financial aid.

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