3. Studying College Access and Choice: A Proposed Conceptual Model

Laura W. Perna
University of Pennsylvania

The student financial aid programs that were authorized under Title IV of the Higher Education Act were intended to ensure that inadequate financial resources would not limit access to college. Nonetheless, despite substantial investment in student financial aid not only by the federal government but also by state governments, colleges and universities, and other entities, college access and choice remain stratified by socioeconomic status (SES) and race/ethnicity. Although students received about $122 billion in financial aid from all sources in 2003–04 (The College Board, 2004), individuals with low family incomes, individuals whose parents have not attended college, African-Americans, and Hispanics are less likely than other individuals to enroll in college. When they do enroll, these groups are concentrated in lower price institutions, such as public two-year colleges and less selective four-year colleges and universities (Baum and Payea, 2004; Ellwood and Kane, 2000; National Center for Education Statistics [NCES], 2003, 2004; Thomas and Perna, 2004).

For example, although college enrollment rates increased over the past two decades for 18- to 24-year-old high school graduates regardless of family income, college enrollment rates continue to be substantially lower for students in the lowest family income quartile than for students in the highest family income quartile (Mortenson, 2001). The current 30-percentage point gap in college enrollment rates between low-income and high-income students is comparable to the size of the gap in the 1960s (Gladieux and Swail, 1999). Descriptive analyses show that smaller percentages of students with low family incomes than of students with high family incomes expect to graduate from college, take a college entrance examination, apply to a four-year college, and enroll in a four-year college,

J.C. Smart (ed.), Higher Education: Handbook of Theory and Research, Vol. XXI, 99–157.

even when considering only high school graduates who are academically qualified to enroll in college (Fitzgerald, 2004). Other analyses show that, in 1999–2000, students from families with incomes below $30,000 represented smaller shares of students at private four-year (19%) and public four-year (23%) institutions than at public two-year institutions (30%; Baum and Payea, 2004). In contrast, students from families with incomes of $90,000 or more represented substantially higher shares of students at private four-year (30%) and public four-year (21%) institutions than at public two-year institutions (13%; Baum and Payea, 2004).

In terms of racial/ethnic group differences, enrollment rates also continue to be lower for African-Americans and Hispanics than for Whites. Only 52% of Hispanics and 55% of Blacks who completed high school in 2001 enrolled in college in the fall after graduating from high school, compared with 64% of Whites (NCES, 2004). Among those who enroll, both African-American and Hispanic first-time undergraduates are relatively concentrated in two-year rather than four-year institutions. African-Americans represented a higher share of first-time freshmen at two-year than at four-year institutions in fall 2001 (14.0% vs. 11.1%). Following a similar pattern, Hispanics represented 12.2% of first-time freshmen at two-year institutions in fall 2001, but only 6.6% of first-time freshmen at four-year institutions (NCES, 2003).

PURPOSE OF THE CHAPTER

Some observers (e.g., Advisory Committee on Student Financial Assistance, 2002; Fitzgerald, 2004; St. John, 2003) argue that continued gaps in educational opportunity are primarily due to the inadequacy of existing financial aid programs. Others (e.g., Ellwood and Kane, 2000; Perna, 2004a) acknowledge the importance of student financial aid but stress the barriers that are imposed by inadequate academic preparation. A third explanation for continued gaps in college enrollment may pertain to the adequacy of information about financial and academic requirements for attending college, as well as the availability of student financial aid to offset the costs of attendance (Kane, 1999).

One reason for disagreement about the relative contributions of financial and academic resources to the observed stratification of college access and choice is that researchers have used a variety of theoretical and methodological approaches to examine the problem. In an effort to bring order to the study of student college choice, this chapter provides a comprehensive review, synthesis, and critique of the approaches that researchers have used and offers recommendations, based on this review,

to guide future research. A primary contribution of this chapter is to propose a conceptual model for studying student college choice. Recognizing that neither approach alone is sufficient for understanding differences across groups in student college choice, the proposed conceptual model integrates aspects of economic and sociological approaches. The model assumes that an individual's assessment of the benefits and costs of an investment in college is shaped by the individual's habitus, as well as the school and community context, the higher education context, and the social, economic, and policy context.

This review provides an update to two outstanding literature reviews on this topic: Hossler, Braxton, and Coopersmith (1989) and Paulsen (1990). These reviews have served as the starting point for a generation of research on college access and choice. Despite the contribution of these reviews, however, an update is required because of changes in the nature of research on college access and choice in the 15 years following their publication. The most notable changes pertain to the theoretical and conceptual frameworks and the methodological approaches used, and the populations examined. Whereas Paulsen (1990) identified distinct disciplinary approaches (e.g., sociological and economic), more recent research draws on additional frameworks within these perspectives (e.g., social and cultural capital) and increasingly adopts a conceptual model that draws on multiple theoretical perspectives (e.g., Freeman, 1997; Perna, 2000). Moreover, virtually all of the studies reviewed by Hossler and colleagues and Paulsen employed quantitative analytic techniques, but recent research reflects the contribution of an increasing number of scholars (e.g., DeLarge, 2003; Freeman, 1997; McDonough, 1997) who use qualitative methodological approaches. Finally, in contrast to the research in the two earlier reviews, recent research includes attention to understanding the college-choice processes of particular groups, such as African-Americans, Hispanics, and students of low-family income and low SES.

Drawing on the Hossler and Gallagher (1987) three-phase model of college choice, this chapter uses the term "college choice" to refer to all phases of the process. Based on their review and synthesis of prior research, Hossler and Gallagher (1987) concluded that the three stages of the college process are predisposition, search, and choice. In the first stage, predisposition, students become predisposed toward or interested in attending college as they develop educational and occupational aspirations (Hossler and Gallagher, 1987; Terenzini, Cabrera, and Bernal, 2001). In the second stage, students search for information about colleges (Hossler and Gallagher, 1987; Terenzini, Cabrera, and Bernal, 2001). While still

less frequently researched than the other two stages, researchers who have examined this stage typically operationalize "search" in terms of the sources of college-related information that students and parents use (e.g., Hossler, Schmit, and Vesper, 1999) and/or the number of colleges that students consider or to which they apply (e.g., Hossler, Schmit, and Vesper, 1999; Hurtado *et al.*, 1997; Long, 2004c). In the third stage, students decide to enroll in a particular college or university. Little is known about the timing of these three stages for nontraditional enrollment. But for "traditional" college enrollment (i.e., enrollment into college immediately after graduating from high school), predisposition typically occurs between the 7th and 10th grades, search during the 10th through 12th grades, and choice during the 11th and 12th grades (Hossler, Schmit, and Vesper, 1999; Terenzini, Cabrera, and Bernal, 2001). This review includes attention to all three stages of the college-choice process.

Finally, research on college choice has long viewed student decision makers as faced with a variety of postsecondary schooling and nonschooling alternatives (e.g., Manski and Wise, 1983). Those students who are very certain that they will or will not attend college focus primarily on only the schooling or only the nonschooling options, respectively. However, many consider both schooling and nonschooling options and stand at the margin in their college-choice process, facing a decision between the options of attending or not attending any type of college. Policies that affect this type of college-choice behavior are often considered "access" policies. This chapter views both decisions about whether or not to attend college and decisions about which particular college to attend as important parts of the broader student-college-choice construct and process to be examined.

IMPORTANCE OF CONTINUED ATTENTION TO THEORY AND RESEARCH ON STUDENT COLLEGE CHOICE

College attendance imposes costs (e.g., tuition, fees, books, foregone earnings) and generates benefits for both individual participants and society. A gain in lifetime earnings is the most easily observed benefit that accrues to individuals who invest in higher education. In 2003, average lifetime earnings were 73 times higher for individuals who attained a bachelor's degree than for individuals who attained only a high school diploma (Baum and Payea, 2004). A portion of the observed earnings premium may be attributable to other differences between high school and college graduates, including differences in ability and motivation. Nonetheless, research shows that earnings are higher for college graduates

than for high school graduates, even after controlling for these characteristics (e.g., Perna, 2003).

Society also realizes impressive gains from a student's investment in higher education. Among the societal benefits of higher education are increased national income and productivity, increased state workforce productivity, increased economic activity in the community in which the higher education institution is located, and reduced cost of taxpayer-funded social support programs (e.g., welfare, Medicaid), as well as lower crime rates, greater community service and civic involvement, greater improvements in knowledge and technology, and improved educational outcomes for future generations (Baum and Payea, 2004; Bowen, 1997; Fatima and Paulsen, 2004; Leslie and Brinkman, 1988; Paulsen, 1996a,b). These societal benefits provide one rationale for government intervention in the higher education market. Specifically, the benefits of an investment in higher education "spillover" beyond individual participants to nonparticipants, thereby justifying attempts by policymakers and practitioners to improve higher education opportunity (Paulsen, 2001b).

Experts frequently assert that college attendance is "essential to the nation's social progress and economic prosperity" (National Dialogue on Student Financial Aid, 2003, p. 4). Carnevale and Desrochers (2003) argue that postsecondary education is increasingly important to the nation's global competitiveness, given the shift from an industrial economy to an information and technology-driven economy. Their analyses of data from the Census Bureau and Current Population Survey suggest that new jobs increasingly require at least some postsecondary education and that the educational requirements of all jobs, including those that once required no more than a high school education, have been rising (Carnevale and Desrochers, 2003). For example, 69% of white-collar office workers, the largest, fastest growing, and among the highest paying categories of employment, had at least some college education in 2001, up from 37% in 1973 (Carnevale and Desrochers, 2003). Although the number of front-line factory jobs declined by 21 million between 1959 and 2001, the remaining jobs in this sector are increasingly held by workers who have at least some college education (31% in 2001 vs. 8% in 1973; Carnevale and Desrochers, 2003).

Projected demographic trends suggest that the demand for college-educated workers will continue to increase in the near future. Over the next 20 years, baby boomers will retire from the labor force, resulting in a substantial shortage of workers, especially workers with the most education and experience (Carnevale and Desrochers, 2003). Although the number of high school graduates is projected to increase by 2.5%

nationwide between 2001–02 and 2017–18 (Western Interstate Commission for Higher Education [WICHE], 2003), this growth will likely be insufficient to meet labor market demands (Carnevale and Desrochers, 2003). Carnevale and Desrochers (2003) estimate that, in 2020, the demand for workers will exceed the supply by 20 million overall, and by 14 million among workers with at least some college education.

One likely consequence of a demand for college-educated workers that exceeds the available supply is an increase in the college earnings premium, or the difference between the average earnings of college and high school graduates. Growth in the earnings premium, in turn, contributes to the continued economic and social stratification of American society. The earnings differential between those with some college education and those who graduated from high school also increased during the 1980s and 1990s (Carnevale and Descrochers, 2003). By building human capital, college enrollment enables individuals to earn higher incomes throughout their lifetimes (Becker, 1993; Paulsen, 2001a). Thus, policies that increase higher education enrollment equalize incomes more efficiently than other government interventions including direct transfers (i.e., annual income subsidies) to low-income individuals or individuals from underrepresented racial/ethnic groups (Paulsen, 2001b).

Identifying ways to close the gaps in college choice is also important because of projected changes in the racial/ethnic composition of the traditional college-age population. The number of high school graduates is projected to increase steadily until 2008–09, then decline through 2014–15, and then rise again through 2017–18 (WICHE, 2003). While growing numbers of high school graduates may challenge the capacity of the nation's higher education system to accommodate all potential students, college choice may also be affected by changes in the characteristics of high school graduates. Between 2001–02 and 2013–14, the number of White public high school graduates is projected to decline by 11%, while the numbers of other groups will rise, with increases of 73% for Hispanics, 44% for Asians, 16% for American Indians, and 6% for Blacks (WICHE, 2003). Specifically, the fastest growing racial/ethnic group—Hispanics—is the group that now has the lowest rate of college enrollment.

Current trends in the economy and financial policies and practices related to the affordability of college seem to be working in contradiction to intentions to close gaps in college choice. For the past two decades, tuition has grown faster than family income (The College Board, 2004). After controlling for inflation, average tuition increased between 1993–94 and 2003–04 by 35% at private four-year institutions and 44% at public

four-year institutions, while the median income for families with parents between the ages of 45 and 54 increased by only 6% over this period (The College Board, 2004). Because increases in tuition have exceeded increases in family income and inflation, affordability has declined (National Center for Public Policy and Higher Education, 2004). In its 2004 report card, the National Center for Public Policy and Higher Education awarded 36 of the 50 states an "F" for affordability, a category based on a family's ability to pay for two-year and four-year colleges in the state, the availability of need-based financial aid and low-priced colleges, and the average student debt. Moreover, the performance of 17 states fell over the past decade on all 6 of the affordability indicators (National Center for Public Policy and Higher Education, 2004).

College choice must continue to be addressed in research, policy, and practice. Persisting gaps in college access and choice across income, SES, and racial/ethnic groups suggest that existing approaches are insufficient. Ensuring that all individuals have the opportunity to enroll in college is a critical step toward maximizing the private and public benefits that result from higher education, including state and national economic prosperity. Projected demographic changes and current trends in higher education finance further underscore the need for continued attention to theory and research on college choice.

THEORETICAL APPROACHES TO EXAMINING COLLEGE CHOICE

Hossler, Braxton, and Coopersmith (1989) and Paulsen (1990) agreed that two theoretical perspectives are useful for guiding research on college access and choice: an economic model of human capital investment and a sociological model of status attainment. A review of research published since 1990 illustrates not only the continued usefulness of these theoretical perspectives but also the appropriateness of a wider range of sociological constructs. Drawing on the strengths and weaknesses of these theoretical perspectives and incorporating what is known from recent research, this section proposes a conceptual model that integrates constructs from both economic and sociological perspectives. One particular strength of the proposed conceptual model is the explicit recognition of the influence on decisions of various levels of context, including aspects of schools and communities, higher education institutions, and the social, economic, and policy context.

Economic Model of Human Capital Investment

A number of researchers (e.g., Kane, 1999; Long, 2004a; Manski and Wise, 1983) have used economic models of human capital investment to examine students' college choices. Human capital investments are designed to enhance individuals' "mental and physical abilities," in order to enhance their productivity (Becker, 1962). Human capital theory predicts that productivity increases are rewarded by higher earnings (Becker, 1993; Paulsen, 2001a), and that differences in productivity are attributable to differences in the investments that individuals make in their personal development, such as the quantity and quality of their education, the amount of their on-the-job training, their geographic mobility, and their emotional and physical health (Becker, 1962; Schultz, 1961). While other types of investments also improve human capital, among the most worthwhile of human capital investments are education and training (Becker, 1993). Human capital theory assumes that additional years of education raise productivity, and thus earnings, "mainly by providing knowledge, skills, and a way of analyzing problems" (Becker, 1993, p. 19).

Rational models of human capital investment assume that individuals decide to invest in additional education based on a comparison of the expected lifetime benefits with the expected costs (Becker, 1962, 1993; Ellwood and Kane, 2000; Paulsen, 2001a). Individuals are assumed to act rationally in ways that maximize their utility, given their personal preferences, tastes, and expectations (Becker, 1962, 1993). Human capital theory assumes that individuals consider both monetary and nonmonetary benefits in their calculation of the total expected benefits of higher education (Becker, 1993). Theory predicts, and research shows, that individuals realize a number of benefits from an investment in higher education. In addition to the increase in earnings described earlier, individuals realize other long-term benefits including more fulfilling work environments, better health, longer life, more informed purchases, and lower probabilities of unemployment. Individuals who attend college also realize such short-term consumption benefits as enjoyment of the learning experience, involvement in extracurricular activities, participation in social and cultural events, and enhancement of social status (Baum and Payea, 2004; Bowen, 1997; Leslie and Brinkman, 1988). The costs of investing in a college education include the direct costs of attendance (e.g., tuition, fees, room, board, books, and supplies), less financial aid, the opportunity costs of foregone earnings and leisure time, and the costs of traveling between home and institution (Becker, 1993).

Recognizing that differences in expected costs and benefits cannot completely explain observed differences in college choice, economists (e.g., Becker, 1993; Ellwood and Kane, 2000; Paulsen, 2001a) note that differences in college choice are also attributable to variations in the forces that shape the demand for human capital and the supply of resources for investing in human capital. Differences in the demand for higher education are expected to reflect differences across groups in academic preparation and achievement, while differences in the supply of resources available to pay the costs of higher education are expected to reflect differences in the availability of student financial aid, loan limits, and parental willingness to contribute to college costs (Ellwood and Kane, 2000; Paulsen, 2001a). Therefore, individuals with greater academic preparation and achievement (i.e., greater initial stock of human capital) and individuals with greater personal financial resources are predicted to be more likely to enroll in college (Catsiapis, 1987). College enrollments are also expected to be higher for individuals with greater academic preparation and achievement, since they are more likely to successfully complete the educational program and obtain a job that produces a future earnings premium (Catsiapis, 1987).

Numerous quantitative studies (e.g., Avery and Hoxby, 2004; Ellwood and Kane, 2000; Long, 2004a; Manski and Wise, 1983) use a human capital investment model to examine college choice. Most studies focus on the third stage of the process, examining the decision to enroll and selection of a particular institution to attend. A primary contribution of human capital approaches to college choice is their focus on the effects of "finances," including family income, tuition, and financial aid, on enrollment (Terenzini, Cabrera, and Bernal, 2001). As a typical example, Ellwood and Kane (2000) used a human capital investment model to guide multivariate analyses of the relationship between family income and enrollment in college within 20 months of graduating from high school after controlling for measures of academic ability and achievement, tuition and financial aid, and tastes (measured by parental education).

Although a human capital investment model illuminates the effects of variables like family income and academic ability on college-related decisions, this approach has limited usefulness for understanding sources of differences in college choices across groups. A rational human capital investment model assumes that, even when the expected benefits and costs are the same, two individuals may make different college choices because of differences in their preferences, tolerance for risk, and uncertainty (DesJardins and Toutkoushian, 2005). While acknowledging that utility varies across individuals, "[e]conomists take preferences as given

and do not delve into how they are formed or why they differ across individuals" (DesJardins and Toutkoushian, 2005, p. 211).

When based on available information (regardless of its accuracy), an individual's choice may be rational (DesJardins and Toutkoushian, 2005). Human capital models do not assume that individuals have perfect and complete information, but evaluate college options based on available information about the benefits and costs. DesJardins and Toutkoushian (2005) articulate the economist's view of the relationship between "rational behavior" and "differential access to information" in the college-choice process in the following way:

> While having inaccurate or incomplete information may affect a student's decision, the decision would still be rational provided that it was based on a reasoned reaction to the information available to them at the time that they made the decision. (p. 218)

Recent college-choice research is consistent with this view of the roles of rational behavior and differential access to information about the benefits and costs of college in the college-choice process. Based on his review and synthesis of research, Heller (1997) observed that students "react differently to various forms of financial aid and tuition changes, even if the economic value of each is the same" (p. 632). Similarly, using a sample of high-aptitude 1999–2000 high school seniors, Avery and Hoxby (2004) found that college enrollment is influenced by nonpecuniary aspects of grants, including whether the aid is labeled "grant" or "scholarship," and whether the grant aid is frontloaded. Inadequate knowledge and information about student financial aid may be a primary explanation for differences between students in their behavioral responses to what might objectively be viewed as similar dollar amount changes in costs and benefits of college attendance (Avery and Hoxby, 2004; Heller, 1997).

Potential students not only lack information about college opportunities but also have differential access to information (Kane, 1999). Unlike with many (but not all) for-profit firms in competitive industries, buyers of higher education are unable to obtain complete information about the "product" until they "experience" it (Winston, 1999). However, the cost of "experiencing" a college education is substantially higher than the cost of "experiencing" a pair of shoes or a restaurant meal. Potential first-generation college students, a large percentage of whom are Black and Hispanic (NCES, 2004), may be particularly disadvantaged by this characteristic of higher education markets if they are unable to obtain relevant information from their immediate family, school, or community context.

Research generally shows that many prospective college students are poorly informed about both the costs and the economic benefits of an investment in higher education, and that the lower observed enrollment rates for low-income students, African-Americans, and Hispanics may be attributable, at least in part, to this lack of information. Based on its review of research published between 1980 and 1989, the U.S. Government Accounting Office (U.S. GAO, 1990) concluded that students and their parents generally lack accurate knowledge and information about college costs and the availability of financial aid to offset the costs. A review of research published since 1985 shows the continued appropriateness of the GAO's conclusion (Perna, 2004c). Although research has not established the direction of causality between knowledge of college costs and financial aid and college-related behaviors, the lack of awareness and understanding about college costs and financial aid is evident even among students and parents who report that they expect to go to college (Perna, 2004c). Most studies show that parents and students overestimate college costs and lack accurate information about financial aid (McColloch, 1990; Ikenberry and Hartle, 1998). Research also shows that parents with lower incomes and lower levels of education know less about various types of financial aid (Olson and Rosenfeld, 1984) and that Black and Hispanic students and parents are particularly uninformed or poorly informed about college prices and financial aid (Horn and Flores, 2003; Immerwahr, 2003; Tomás Rivera Policy Institute, 2004; Tornatzky, Cutler, and Lee, 2002).

Although research consistently shows that many students and their parents lack accurate or complete knowledge and information about college costs and financial aid (Perna, 2004c), other research suggests that students are informed about the benefits of higher education (e.g., Paulsen, 2001a). Based on his review of relevant research, Paulsen (2001a) concluded that, on average, students "appear to be reasonably careful and accurate in their acquisition of information about earnings differentials" (p. 63) associated with higher education. In their examination of students' perceptions of college opportunities, Avery and Kane (2004) concluded that low college enrollment rates for low-income high school students are not attributable to lack of information about the benefits of attending. Their analyses show that students tend to overestimate both the expected wages of college graduates and the costs of attending college. Because of both errors, the net present value of completing a bachelor's degree was positive for about three-fourths of the students in their sample.

Nonetheless, other research suggests that the accuracy of the estimated benefits varies both within and across groups, with less accurate estimates by individuals from lower-income families than by other

individuals (Paulsen, 2001a). Dominitz and Manski (1996) found that, even in a sample of high school and college students with above average parental education and family income, estimates of the earnings of college graduates varied substantially. In his study of undergraduates at one university, Betts (1996) found that, even after controlling for gender, race, grade-point average, parents' education, and major field, students from lower-income families had significantly lower estimates of both the starting salaries of college graduates and the average salaries of college graduates between the ages of 25 and 34 who were working full-time. Moreover, the accuracy of estimates was greater for college seniors than for college freshmen (Betts, 1996), suggesting that individuals may have even less accurate knowledge and information before they enter college. From focus groups of Hispanic high school seniors in five states, Immerwahr (2003) concluded that one barrier to college enrollment for Hispanics is the lack of understanding about the long-term benefits of college.

In summary, although traditional human capital approaches are useful for conceptualizing the criteria that individuals consider and the effects of costs and benefits on students' college-choice behavior, they are insufficient for understanding all sources of observed differences in college choice across family income and racial/ethnic groups. Research shows that controlling for such demand-related forces as academic ability and such supply-related forces as the availability of financial aid accounts for some of the observed differences across groups in such outcomes as college enrollment (Perna, 2000). But these forces do not completely explain differences in college choices. Paulsen (2001a) notes that students' perceptions of the economic benefits and costs of higher education vary across individuals because of factors that are "often non-monetary, less tangible, and more difficult to assess or estimate" (p. 60). These include, for example, differences in expectations about benefits and costs based on differences in access to information about college or differences in some of the nonmonetary, intangible aspects of the family, school, or community context, the higher education context, and/or the social, economic, and policy context (DesJardins and Toutkoushian, 2005; Paulsen, 2001a).

Sociological-Cultural Approaches

Sociological approaches to college choice typically emphasize the ways in which socioeconomic background characteristics influence student decisions (Terenzini, Cabrera, and Bernal, 2001). Sociological approaches have evolved from the traditional status attainment models developed in the 1970s and 1980s (e.g., Hearn, 1984, 1988; Sewell, Hauser,

and Wolf, 1986) to the models that emphasize the constructs of cultural and social capital (McDonough, 1997).

Traditional sociological status attainment models typically focus on the effects of students' SES on their educational and occupational aspirations. Such models posit that educational aspirations, a prerequisite to postsecondary enrollment, are determined by such behaviors as academic preparation and achievement and such demographic characteristics as SES (Hossler, Schmit, and Vesper, 1999). Status attainment models predict that individuals with higher levels of academic preparation and achievement receive greater encouragement from "significant others," including parents, teachers, counselors, and peers, and that this encouragement promotes higher aspirations. Higher aspirations, in turn, are expected to lead to greater educational and occupational attainments.

As an example, Hearn (1984, 1988) relied on a sociologically derived causal model to investigate the effects of SES and ascriptive characteristics (i.e., race/ethnicity and gender) on college enrollment. Using data from the High School and Beyond Longitudinal Study of 1980 high school seniors, Hearn (1988) argued that, if socioeconomic and/or ascriptive characteristics directly influenced institutional choice after controlling for academic characteristics (e.g., test scores, high school grades, high school curricular track, educational expectations), then the analyses would demonstrate the presence of structural barriers to attainment. After controlling for other variables, Hearn (1988) found that only one of four measures of SES, mother's education, was directly related to the cost of the institution that graduates attended after controlling for other variables. The other measures of SES were related to the dependent variable only indirectly through measures of academic preparation and achievement.

More recent research focuses on the ways in which the sociological constructs of cultural and social capital influence student college choice. Like human capital and physical capital, cultural and social capital are resources that may be invested to enhance productivity (Coleman, 1988) and facilitate upward mobility (DiMaggio and Mohr, 1985; Lamont and Lareau, 1988). Conceptualizations of cultural and social capital have at times overlapped (McNeal, 1999). Cultural capital refers to the system of attributes, such as language skills, cultural knowledge, and mannerisms, that is derived, in part, from one's parents and that defines an individual's class status (Bourdieu, 1986; Bourdieu and Passeron, 1977). Middle- and upper-class individuals possess the most valued forms of cultural capital (McDonough, 1997). Individuals who lack the required cultural capital may: (a) lower their educational aspirations or self-select out of particular situations (e.g., not enroll in higher education) because they do not know

the particular cultural norms; (b) overperform to compensate for their less-valued cultural resources; or (c) receive fewer rewards for their educational investment (Bourdieu and Passeron, 1977; Lamont and Lareau, 1988).

Social capital focuses on social networks and the ways in which social networks and connections are sustained (Morrow, 1999). In his comprehensive assessment of the origins and uses of social capital, Portes (1998) noted that social capital is acquired through an individual's relationships with others, particularly through membership in social networks and other social structures. A primary function of social capital is to enable an individual to gain access to human, cultural, and other forms of capital, as well as institutional resources and support (Coleman, 1988; Hofferth, Boisjoly, and Duncan, 1998; Lin, 2001b; Morrow, 1999; Portes, 1998; Stanton-Salazar and Dornbusch, 1995).

Coleman (1988) and Bourdieu (1986) offer somewhat different conceptualizations of social capital. Coleman's approach, the one most frequently used in educational research (Dika and Singh, 2002), stresses the role of social capital in communicating the norms, trust, authority, and social controls that an individual must understand and adopt in order to succeed. Coleman suggests that social capital is derived from two types of relationships: the relationship between children and their parents and relationships between a parent and other adults, particularly adults who are connected to the school that the child attends.

Bourdieu focuses on the ways in which some individuals are advantaged because of their membership in particular groups (Portes, 1998). According to Bourdieu (1986), the amount of social capital to which an individual may gain access through social networks and relationships depends on the size of the networks as well as the amounts of economic, cultural, and social capital that individuals in the network possess. Bourdieu views social capital as a mechanism that the dominant class uses to maintain its dominant position (Lin, 2001b).

While Coleman's perspective suggests that parents play a primary role in promoting the status attainment of their children, Bourdieu's approach describes the restrictions imposed by structural barriers (Dika and Singh, 2002). Structural barriers are often manifested in the form of differential access across racial/ethnic, gender, and other groups to institutional resources (Dika and Singh, 2002). Despite this and other differences (Dika and Singh, 2002; Lin, 2001b), both Coleman and Bourdieu recognize that "social capital consists of resources embedded in social relations and social structures, which can be mobilized when an actor wishes to increase the likelihood of success in a purposive action" (Lin, 2001b, p. 24).

Both Bourdieu (Bourdieu and Wacquant, 1992) and Lin (2001b) argue that an individual's actions cannot be fully understood except in relation to the social context in which the action occurs. Habitus, or an individual's internalized system of thoughts, beliefs, and perceptions that are acquired from the immediate environment, conditions an individual's college-related expectations, attitudes, and aspirations (Bourdieu and Passeron, 1977; McDonough, 1997). Thus, an individual's decisions about college are not based on rational analyses but are "sensible or reasonable choices" (McDonough, 1997, p. 9). Habitus is the internalized set of dispositions and preferences that is derived from one's surroundings and that subconsciously define what is a "reasonable" action (Bourdieu and Wacquant, 1992; Horvat, 2001; McDonough, 1997; Paulsen and St. John, 2002). Habitus reflects the internalization of structural boundaries and constraints and determines what is possible for an individual (Horvat, 2001).

Research (McDonough, 1997; Perna and Titus, 2005) demonstrates the ways in which both an individual's habitus and the aspects of the school context shape student college choice. McDonough's qualitative study of the college-related decisions of 12 White girls attending four high schools in California shows the roles of both individual and organizational habitus. "Organizational habitus is a way to understand schools' roles in reproducing social inequalities" (McDonough, 1997, p. 156). Organizational habitus shapes college choice by offering a class-based perspective on the process, thereby narrowing the range of possible options. Specifically, McDonough shows that college choices are narrowed by a student's personal circumstances, particularly academic performance and SES, as well as the characteristics of the school attended, especially the organization and structure of guidance counseling at the school. Her analyses reveal sharp differences across schools, particularly in terms of the time and resources that counselors have available for college counseling, the types of colleges emphasized by counselors to students, and the role of counselors in the college-choice process (e.g., reactive vs. proactive participant). Differences in the organization and structure of guidance counseling across schools are related to another layer of context, namely, the SES of communities in which the schools are based (McDonough, 1997).

Using multilevel modeling, Perna and Titus (2005) explore the ways in which the structural context, as measured by characteristics of the high school attended, shapes the college enrollment decisions of high school graduates. Focusing more specifically on the role of parental involvement as a form of social capital, Perna and Titus operationalize structural characteristics in terms of the extent to which the school encourages parental

involvement, the volume of resources that may be accessed via social networks at the school, and the homogeneity of the social networks at the school. Their analyses show that, regardless of an individual student's social, economic, cultural, and human capital, the likelihood of enrolling in a two-year or four-year college after graduating from high school is related to the volume of resources that may be accessed through social networks at the school attended. The volume of resources is measured by such variables as the average levels of parental involvement, family income, parental education, and parental educational expectations at the school the child attends.

Sociological approaches are useful for understanding the ways in which context, influenced in part by structural constraints and opportunities, shapes an individual's perspectives about and orientations toward college choice. Sociological approaches are also useful for exploring differences across groups in college choice (Horvat, 2001). Bourdieu argues that barriers based on race/ethnicity, class, and gender restrict access to institutional resources (Dika and Singh, 2002). An individual's habitus, as well as the types of cultural and social capital possessed, reflect, in part, an individual's race/ethnicity, class, and gender (Horvat, 2001). But despite these contributions, sociological approaches do not offer a framework for examining how individuals ultimately decide whether to aspire to postsecondary education, apply for admission to a set of colleges, or enroll in a particular college or university (Manski, 1993).

Proposed Conceptual Model

When considered separately, neither rational human capital investment models nor sociological approaches are sufficient for understanding differences across groups in student college choice. Manski (1993) argues that economic approaches offer a framework for understanding decision making, but are limited by their failure to examine the nature of information that is available to decision makers. On the other hand, sociological approaches shed light on the ways in which individuals gather information, but do not identify the ways in which individuals make decisions based on this information (Manski, 1993). In an attempt to enhance both economic and sociological approaches to decision making, Manski drew upon sociological notions of emulation and role modeling to develop the Social Learning Proposition. Although the Social Learning Proposition includes the role of only a narrow set of sociological constructs (i.e., emulation and role modeling) and is not specific to college-related decisions, Manski (1993) demonstrates the strengths of a

conceptual model that draws upon constructs from both economics and sociology. In short, the resulting Social Learning Proposition provides a more comprehensive and complete understanding of decision making (Manski, 1993).

Recent research on student college choice also stresses the strengths of models that incorporate aspects of economics of human capital models and sociological notions of cultural and social capital (e.g., Freeman, 1997; Paulsen, 2001a; Paulsen and St. John, 2002; Perna, 2000, 2004b; St. John and Asker, 2001; St. John and Paulsen, 2001; St. John *et al.*, 2004). Based on their review of the role of theory in finance-related analyses, St. John and Paulsen (2001) concluded that, "Social and cultural theories are also important for the study of higher education finance because they provide an alternative, more complete explanation of the role of non-monetary factors that foster and inhibit access" (p. 555).

A conceptual model that draws on both economic and sociological perspectives assumes that students' educational decisions are determined, at least in part, by their habitus, or the system of values and beliefs that shapes an individual's views and interpretations (Paulsen, 2001a; Paulsen and St. John, 2002; Perna, 2000; St. John and Asker, 2001; St. John, Paulsen, and Carter, 2005). A key strength of an integrated conceptual model is the assumption that the pattern of educational attainment is not universal but may vary across racial/ethnic, socioeconomic, and other groups (Paulsen and St. John, 2002; St. John and Asker, 2001). This approach addresses the concern raised by some scholars (Freeman, 1997) that policy interventions will not effectively close gaps in student college choice without recognizing the culture and circumstances of particular groups.

Both qualitative and quantitative research demonstrate the merits of using an integrated conceptual model for examining enrollment decisions. Freeman's (1997) qualitative study revealed that African-American high school students believe that both economic and sociocultural factors restrict the college enrollment of African-Americans. Specifically, Freeman found that African-American high school students were uncertain about their ability to pay the short-term costs of attending and about whether the long-term economic benefits of attending would exceed the costs—i.e., elements of a human capital investment model. Interviewees also pointed to the potential influence of structural barriers (e.g., physical conditions of the schools attended by African-Americans), social capital (e.g., interest and assistance from teachers and counselors, African-American role models), and cultural capital (e.g., believing at an early age that pursuing postsecondary education is a realistic option).

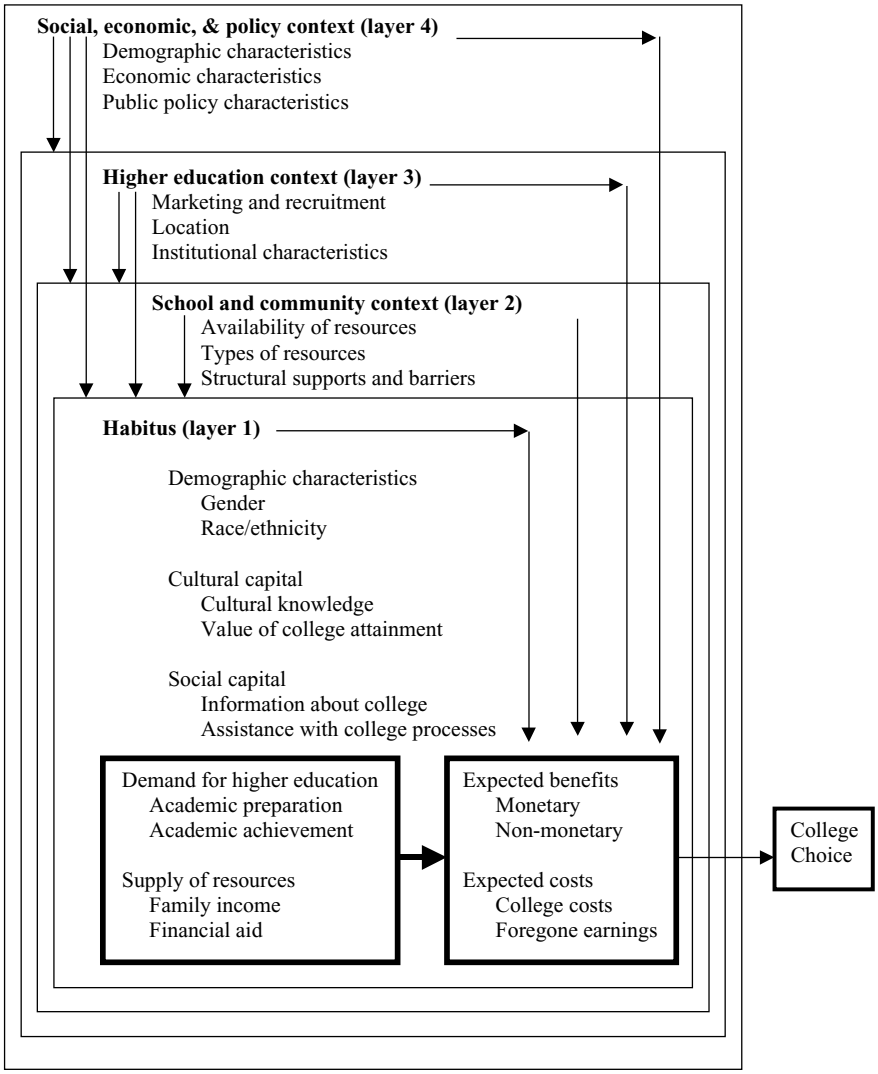
By reflecting differences in expectations, preferences, tastes, and certainty about higher education investment decisions, measures of social and cultural capital appear to be particularly important for understanding differences across groups in college enrollment decisions that are not explained by human capital investment models. Using logistic analyses of data from the National Educational Longitudinal Study (NELS), Perna (2000) found that measures of social and cultural capital improved the explanatory power of a traditional econometric model of college enrollment that included only measures of gender, race, financial resources, and academic preparation and achievement. Moreover, measures of cultural and social capital played a relatively more important role in explaining the college enrollment decisions of African-Americans and Hispanics than of Whites (Perna, 2000).

Figure 3.1 illustrates the proposed conceptual model for examining student college choice. This model draws on an economic model of human capital investment as well as the sociological concepts of habitus, cultural and social capital, and organizational context. Like "the student choice construct" (Paulsen and St. John, 2002; St. John and Asker, 2001), the proposed conceptual model assumes that college enrollment decisions reflect an individual's "situated context." Both the proposed conceptual model and the student choice construct assume that there is not one set course leading to college enrollment but that multiple routes are possible.

At the center of the proposed conceptual model is the human capital investment model in which college-choice decisions are based on a comparison of the expected benefits with the expected costs (see Figure 3.1). The expected benefits include both monetary and nonmonetary benefits, while the expected costs include the costs of attendance and foregone earnings. Also as predicted by human capital investment models, calculations of the expected benefits and costs are influenced by an individual's academic preparation for college and availability of resources to pay the costs of attendance. But unlike human capital investment models, the proposed conceptual model shows that calculations of expected costs and earnings are nested within several layers of context.

The proposed conceptual model assumes that an individual's college-choice decisions are shaped by four contextual layers: (1) the individual's habitus; (2) school and community context; (3) the higher education context; and (4) the broader social, economic, and policy context. By emphasizing these layers of context, the proposed conceptual model recognizes differences across students in the resources that shape college choice (McDonough, 1997). As described in the previous section, an individual's habitus regarding college choice (Figure 3.1, layer 1) is expected

Figure 3.1: Proposed conceptual model of student college choice



to reflect an individual's demographic characteristics, particularly gender, race/ethnicity, and SES, as well as cultural and social capital.

The school and community context (Figure 3.1, layer 2) reflects McDonough's (1997) notion of "organizational habitus," and recognizes the ways in which social structures and resources facilitate or impede student college choice.

Other research suggests that aspects of the school context may restrict college choice for low-income students and racial/ethnic minorities. Stanton-Salazar (1997) argued that such institutional agents as teachers, counselors, and middle-class peers provide access to resources and opportunities including information about college and help with college-admission requirements but that institutional structures limit the ability of working-class minority students to develop "trusting" relationships with institutional agents. Among the restrictive structures are a school focus on bureaucratic processes, the dual role of teachers and counselors as mentors and gatekeepers, and the short-term duration of interactions (Stanton-Salazar, 1997).

The next layer (Figure 3.1, layer 3), the higher education context, recognizes the role that higher education institutions play in shaping student college choice. Higher education institutions may influence the process in several ways. First, higher education institutions may be a source of information to students and their families about postsecondary enrollment options. Higher education institutions may convey information passively, through their location and geographic proximity to students' homes (McDonough, Antonio, and Trent, 1997). Higher education institutions may also actively convey information to students through targeted marketing and recruiting efforts (Chapman, 1981). Second, the attributes and characteristics of higher education institutions also influence student college choice. Students prefer to attend colleges and universities with particular characteristics, especially characteristics that are consistent with their personal and social identities and needs for personal acceptance and institutional support (Nora, 2004). Higher education institutions also influence student college choice through their ability to select which applicants may enroll. Research suggests that students' consider institutional admissions decisions in their college-choice behaviors, as students tend to self-select institutions with SAT scores similar to their own (Manski and Wise, 1983). Finally, higher education institutions influence student college choice through the availability of enrollment slots. Some (e.g., Perna *et al.*, 2005) have speculated that such forces as population growth and improved academic preparation for college may increase the demand for higher education beyond the available supply of enrollment slots at traditional colleges and universities. An excess demand for higher education may cause increased tuition and/or increased competition for available slots, actions that are likely to have the greatest negative impact on students from low-income families, African-Americans, and Hispanics (Perna *et al.*, 2005).

The outermost layer (Figure 3.1, layer 4), the social, economic, and policy context, recognizes that college choice is also influenced, directly and indirectly through other contextual layers, by changes in social forces (e.g., demographic changes), economic conditions (e.g., unemployment rate), and public policies (e.g., establishment of a new need-based grant program). Explicitly incorporating the social, economic, and policy context into the model recognizes the connections between policy and college-choice outcomes identified by other researchers (e.g., Kirst and Bracco, 2004; Paulsen and St. John, 2002; Perna and Titus, 2004; Perna *et al.*, 2005; St. John and Asker, 2001). For example, Kirst and Bracco (2004) argue that policy "signals," emanating from elementary and secondary education and/or postsecondary education about college admissions and placement requirements, play a critical role in students' knowledge about, and academic preparation for, college. Using multilevel analyses, Perna and Titus (2004) found that measures of four types of state public policies (direct appropriations to higher education institutions, tuition, financial aid to students, and elementary and secondary education) were related to the college enrollment patterns of 1992 high school graduates.

In addition to examinations of "college choice," the proposed conceptual model may also guide examinations of such intermediate outcomes in the student-college-choice process as academic preparation and parental saving for college, or of such potentially parallel processes as the decision of bachelor's degree recipients to enroll in graduate or professional education (Perna, 2004b). For example, some researchers (e.g., Cabrera and La Nasa, 2000) argue that, in order to enroll in college, students must accomplish such tasks as becoming academically prepared for college and graduating from high school. The proposed conceptual model may be used to test the hypothesis that a student's habitus toward college enrollment influences a student's decision to become academically prepared for college and/or graduate from high school.

In summary, the proposed conceptual model assumes that, although college choice is ultimately based on a comparison of the benefits and costs of enrolling, assessments of the benefits and costs are shaped not only by the demand for higher education and supply of resources to pay the costs but also by an individual's habitus and, directly and indirectly, by the family, school, and community context, higher education context, and social, economic, and policy context. By drawing on constructs from both human capital and sociological approaches, the proposed conceptual model will likely generate a more comprehensive understanding of student college choice. Through its recognition of the multiple layers of

context, the proposed conceptual model incorporates the perspectives of four major stakeholders in the college-choice process: students (and their parents); K-12 institutions; higher education institutions; and public policymakers. The proposed model will likely be especially useful for understanding differences across groups in college-choice outcomes, because of its explicit recognition of the multiple layers of context that influence an individual's college-related decisions.

METHODOLOGICAL APPROACHES TO EXAMINING STUDENT COLLEGE CHOICE

Although college-choice research has traditionally been dominated by quantitative analyses, qualitative approaches are becoming increasingly common. This section describes the relative contributions of quantitative and qualitative approaches and discusses the strengths and weaknesses of existing sources of national data. The section concludes by identifying key variables that should be included in examinations of student college choice.

Qualitative Versus Quantitative Approaches

While earlier reviews of prior research (Hossler, Braxton, and Coopersmith, 1989; Paulsen, 1990) show that examinations of student college choice are dominated by quantitative methods, a review of research published since 1990 demonstrates the growing contribution of qualitative approaches. Both approaches are critical to the development of knowledge on student college choice.

Quantitative methodologies are especially useful for testing and confirming theoretical propositions about college choice for a particular population. Qualitative methodologies are critical for developing theoretical understandings of student-college-choice processes and for understanding the ways in which college-choice processes play out for individual students (Gall, Borg, and Gall, 1996).

In both quantitative and qualitative research, the most common unit of analysis is the student. Such research focuses on the characteristics, understandings, and behaviors of individual students. Using the conceptual model in Figure 3.1 as a guide, a study of college choice that uses the student as the unit of analysis might explore the influence of student financial aid on student college choice in the context of the student's habitus (layer 1).

Quantitative approaches to student college choice typically utilize multivariate analyses to isolate the relationship between key independent variable(s) and the outcome of interest after controlling for other variables. Because many college-related outcomes are dichotomous (e.g., aspire to college, yes or no; apply to college, yes or no; enroll in college, yes or no), logistic regression is common in quantitative analyses of college choice. Multinomial logistic regression, a special case of the general log-linear model, is appropriate when the dependent variable has more than two categories (e.g., enroll in a four-year institution, enroll in a two-year institution, or do not enroll). A few studies (e.g., Hearn, 1988) use path analysis to model college enrollment as a process in which exogenous variables (e.g., SES, race/ethnicity) influence college enrollment directly and indirectly through measures of academic preparation.

Some quantitative research (e.g., Heller, 1999; Kane, 1999; St. John, Musoba, and Chung, 2004; St. John *et al.*, 2004) uses the state, rather than the student, as unit of analysis. As an example, controlling for state-level measures of demographic context and characteristics of the state higher education system and using fixed-effects ordinary least squares regression, St. John, Chung, *et al.* examine the relationship between state-level measures of public finance policies (e.g., tax rates, tuition, financial aid) and two outcomes: academic preparation for college (i.e., high school graduation rates) and college enrollment rates. Other researchers (e.g., Heller, 1999; Kane, 1999) model enrollment in a state as a function of such state characteristics as tuition, unemployment, and need-based grant spending.

Recognizing that student behavior is shaped by context, as illustrated in Figure 3.1, some multilevel analyses use both the student and the state as the units of analysis. Perna and Titus (2004) used multilevel modeling to examine the effects of various types of state public policies on the type of college or university that high school graduates attend after taking into account student-level predictors of enrollment. State-level variables included measures of state appropriations to higher education, tuition, availability of need-based and non-need-based student financial aid, K-12 education, and the availability of higher education in the state.

Other research uses the student and the school as units of analysis. For example, Perna and Titus (2005) use multilevel analyses of student- and school-level data from the NELS to examine the extent to which college enrollment is shaped not only by an individual's student's parental involvement but also by the volume of social and other forms of capital that may be available through social networks at the school. The analyses include such student-level variables as gender, race/ethnicity, family

income, importance of financial aid and college costs, academic preparation, and parental involvement, as well as variables that measure such aspects of the school structural context as the extent to which the school encourages parental involvement, the volume of resources that may be accessed via social networks at the school, and the homogeneity of the social networks at the school.

Other quantitative analyses explicitly recognize that student college choice is a series of related decisions (DesJardins, Ahlburg, and McCall, in press; Long, 2004a). For example, Long (2004a) examines the relationship between institutional characteristics and the likelihood of choosing to attend that institution (i.e., which choice to attend), conditional on enrolling at any type of postsecondary education institution (i.e., whether to attend). Asserting that prior research incorrectly assumes that decisions are independent, DesJardins and colleagues use a random utility model of student college choice to simultaneously estimate application, admission, and enrollment decisions while controlling for the nonrandom nature of financial aid applications and awards. The analyses first involve estimating the probability of being awarded financial aid, conditional on applying for aid, and the amount of financial aid awarded, conditional on applying for aid and being awarded aid. Then, the probability of admission is estimated, conditional on applying for admission to the institution. Finally, the probability of enrolling in an institution is estimated, conditional on the probability of admission. While more sophisticated than other statistical techniques, this approach may address the potential selection bias that may occur in a study that focuses on one college-related decision in isolation.

Qualitative approaches to student college choice utilize such methods as group interviews (e.g., Freeman, 1997), case studies (e.g., McDonough, 1997), and life history (e.g., González, Stone, and Jovel, 2003). For example, Freeman (1997) conducted 16 structured group interviews involving 70 African-American high school students in five cities with large African-American populations. González, Stone, and Jovel (2003) used life history to compare the effects of primary and secondary school educational experiences on the college choices of 12 low-income Latinas who were enrolled in a selective university and 10 low-income Latinas who were enrolled in a community college. Group interviews and life history approaches may be especially effective for giving voice to the experiences of students from underrepresented groups and for developing a greater understanding of the barriers to college enrollment for these individuals.

Qualitative approaches may also incorporate multiple levels of analysis. In her qualitative case studies of the college-choice processes of students at four high schools in California, McDonough (1997) demonstrated the ways in which both the student's habitus and the school context (i.e., "organizational habitus") influenced students' college choices. Seeking to inform theory about student college processes, McDonough used rich case studies of individual students and cross-case analysis across the four schools. To control for gender, race/ethnicity, and academic achievement, she selected 12 White average-performing, college-bound, high school seniors who attended four high schools in California. The four high schools varied in terms of students' average SES and the nature of college guidance systems. For each of the 12 selected students, the case studies also included interviews with a parent, best friend, and school advisor and a review of the student's transcript. These data were supplemented by questionnaires administered to all students in the academic curricular track at each school. Data from the questionnaires describe the organizational context of each school, providing information about peers' educational and occupational aspirations and plans and college-related activities. McDonough also collected data from guidance counselors about the structure and nature of college guidance at the school and college destinations of graduates, as well as from observations of bulletin boards, college counseling facilities, and computer resources, and documents.

Although a small number of studies (e.g., Hossler, Schmit, and Vesper, 1999) incorporate both qualitative and quantitative techniques, the vast majority of studies opt for one approach or the other. As Creswell (2003) observes, mixed method designs involve additional challenges, including the time required for collecting and analyzing the data and the required researcher expertise. In their eight-year longitudinal study of student college choice, Hossler, Schmit, and Vesper (1999) administered questionnaires to a sample of 4,923 students and parents eight times between 1987 and 1990 and interviewed a subsample of 56 students and parents nine times between 1989 and 1994. Students were high school freshmen in the first year of data collection.

Qualitative approaches are especially useful for discovering theoretical propositions to explain student-college-choice processes, developing in-depth understandings of student-college-choice processes for particular students, and understanding the influence of the context or setting on student college choice (Gall, Borg, and Gall, 1996; Marshall and Rossman, 1999). However, the results of qualitative research have

limited generalizability, as the samples involved are not representative of a particular population.

In contrast, the results of quantitative analyses, especially those using data that are representative of the college-going population nationwide, have high external validity. Quantitative analyses have other limitations, however, including the inability to describe the experiences of any particular individual. Moreover, quantitative researchers are typically challenged to identify appropriate proxies for complex constructs, particularly aspects of cultural and social capital. For example, researchers (Dika and Singh, 2002; Morrow, 1999; Perna and Titus, 2005) note that quantitative studies often measure parental involvement with variables that reflect the quantity rather than the quality of interactions.

Both quantitative and qualitative approaches have strengths and weaknesses. Therefore, qualitative research should be informed by the findings of quantitative research, and vice versa. Both approaches are important for developing a comprehensive understanding of student college choice in general, and of the student-college-choice experiences and processes of students of different groups in particular.

Sources of National Data

Much of the recent quantitative research on student college choice utilizes data from the NELS, a database that is sponsored by the U.S. Department of Education's NCES. The NELS contains data for a cohort of students in the 8th grade (1988) and when most of the students were high school sophomores (1990), high school seniors (1992), two years after their scheduled high school graduation (1994), and eight years after their scheduled high school graduation (2000). The sample was freshened in 1990 and 1992 to ensure representative cohorts of 1990 10th graders and 1992 12th graders, respectively.

The NELS is the third in a series of longitudinal studies that is designed to provide data on students' transition from high school to postsecondary education. The National Longitudinal Study (NLS) of 1972 high school seniors followed students periodically through 1986. The High School and Beyond (HS&B) Study followed 1980 high school seniors periodically through 1986 and 1980 high school sophomores periodically through 1992. The Educational Longitudinal Study 2002 tracks the experiences of 2002 10th graders through high school and into postsecondary education and the workforce, with data collections in 2002, 2004, and 2006.

Each of these longitudinal data sets offers researchers the opportunity to examine the development of the college-choice process as a student moves through high school. Together, this collection of longitudinal data sets allows researchers to examine changes in the college-choice process over time from the 1970s through 2000s. The strengths of these data sets include large sample sizes, high response rates, and multiple data sources (e.g., student interviews, parent interviews, transcripts, standardized tests). One weakness of the NELS is that, because the sampling frame is based on the school attended in the 8th grade, the database includes small numbers of students enrolled at particular colleges and universities.

Other studies (e.g., McDonough, Antonio, and Trent, 1997; McDonough *et al.*, 2004) rely on data from the Cooperative Institutional Research Program (CIRP), sponsored by the Higher Education Research Institute at the University of California, Los Angeles. The Freshman Survey, an instrument that participating institutions administer to each year's freshman class, provides data on the characteristics of the entering class, with attention to reasons for attending college, as well as demographic characteristics, college-related expectations, high school experiences, educational and occupational goals and plans, college finances, and other attitudes and values.

Because the data are clustered by college or university and not elementary or secondary school (as for the NELS), the CIRP data may offer some advantages for researchers interested in examining the college choices if students at particular types of colleges and universities, including Historically Black Colleges and Universities (HBCUs; McDonough, Antonio, and Trent, 1997) and selective institutions (McDonough *et al.*, 2004). Nonetheless, the CIRP data have several disadvantages for studies of college choice. In particular, the data are limited to individuals who actually enrolled in college, retrospective about the college-choice process, and not representative of colleges and universities nationwide. Only a subset of four-year colleges and universities volunteer to participate in the annual CIRP data collection.

Researchers must also recognize other challenges and limitations associated with using any existing database (St. John, 2004). As mentioned earlier, secondary data sources that are based on survey instruments typically include limited measures of such complex constructs as cultural and social capital (Perna, 2000; Perna and Titus, 2005). Researchers must also make decisions about approaches to missing data (see for example Perna and Titus, 2005). Moreover, most existing national data sets include

limited numbers of students of particular groups, such as American Indians/Alaskan Natives.

Dependent Variables

As noted by others (St. John and Asker, 2001), the college-choice process may be understood as a series of choices. Among the choices are determining educational and occupational aspirations, which institutions to consider, whether attend college, and which college to attend.

Predisposition: Aspirations, Expectations, and Plans

Researchers typically operationalize "predisposition" in terms of students' aspirations, expectations, or plans for college (e.g., Hossler, Schmit, and Vesper, 1999; Hossler and Stage, 1992; Kao and Tienda, 1998; Stage and Hossler, 1989). Others (e.g., Hossler, Schmit, and Vesper, 1999; Kao and Tienda, 1998) examine changes in predisposition over the high school years.

At least three challenges limit research on student predisposition toward college. One challenge is determining what students understand "college" to mean or require. In their exploratory study using data from eight focus groups of students attending two high schools in Chicago, Kao and Tienda (1998) found that many students had incomplete information about "college" including the level of education that was required for particular occupations. While Asians (who were generally of higher SES) generally had more accurate knowledge of the educational requirements for particular occupations, Hispanics tended to have less accurate knowledge and less information about differences among types of white-collar work or college and financial aid requirements. Similarly, using data from the National Longitudinal Study of Youth, Ludwig (1999) found that 81% of individuals between the ages of 14 and 21 underestimated the level of education required for the expected occupation. Individuals living in poor urban areas were less likely than other individuals to have accurate information about the labor market (Ludwig, 1999).

Second, research examining the predisposition stage of the college-choice process is limited by the absence of clear and consistent measurement of the dependent variable. Some researchers (e.g., Adelman, 1999) emphasize that educational plans are a more important predictor of college enrollment than educational aspirations or expectations. Adelman (1999) argues that "aspirations" reflect outcomes that are desired

regardless of how realistic, while "plans" reflect a more realistic appraisal of future behavior and a scheme for achieving the desired outcome. Despite these conceptual distinctions, however, researchers tend to use the labels aspirations, expectations, and plans interchangeably.

Third, examinations of students' predisposition are also complicated by the extent to which students report what they perceive to be the expected response (e.g., at least a bachelor's degree). Avery and Kane (2004) found that a substantial share of high school seniors indicated interest in attending a four-year college, but did not take the SAT examination or apply for admission. Avery and Kane speculated that the observed gap between stated educational expectations and actual behaviors may be attributable, at least in part, to the tendency of students to state high educational expectations in order to please their teachers and/or the researchers.

Search

Researchers have used several variables to operationalize outcomes in the second stage of the choice process, search. These dependent variables include the number of colleges which a student considers (e.g., Hossler, Schmit, and Vesper, 1999), the number of colleges to which a student applies (Hurtado *et al.*, 1997), the number of various types of colleges to which SAT scores are sent (Long, 2004c), the likelihood of applying to a particular institution (Weiler, 1994), the likelihood of applying to any four-year college (Cabrera and La Nasa, 2001), and the sources of information that students and parents use to learn about college and financial aid (Cabrera and La Nasa, 2001; Hamrick and Hossler, 1996; Hossler and Vesper, 1993; Tomás Rivera Policy Institute, 2004; Tornatzky, Cutler, and Lee, 2002).

Choice

Echoing the conclusion of others (Hossler, Braxton, and Coopersmith, 1989), the third stage of the college-choice process continues to be the most frequently examined part of the process. Some researchers operationalize outcomes in the third stage using such dichotomous measures as whether or not a student enrolled in a four-year college or university (Perna, 2000), enrolled in any postsecondary institution (Ellwood and Kane, 2000; Kane, 1999), or enrolled in their first-choice institution (Hurtado *et al.*, 1997). Others utilize multinomial outcome measures including enrolled in a two-year institution, enrolled in a four-year institution, or

did not enroll (Perna and Titus, 2005; Rouse, 1994), enrolled at a four-year institution, enrolled full-time at a two-year institution, enrolled part-time at a two-year institution, or did not enroll (Plank and Jordan, 2001), or enrolled in an in-state public two-year institution, enrolled in an in-state public four-year institution, enrolled in an in-state private four-year institution, enrolled in an out-of-state institution, or did not enroll (Perna and Titus, 2004). Still others measure aspects of choice using continuous variables, such as the price of attending an institution (i.e., tuition and fees; Hearn, 1988).

Key Independent Variables

Regardless of whether qualitative or quantitative methods are used, rigorous research is characterized, at least in part, by the ability to rule out alternative explanations for identified relationships. Thus, selecting appropriate independent and control variables is a critical step in the research design.

Researchers may rule out alternative explanations by either taking variables into account in the analyses or by controlling for particular variables in the sample selection process. For example, research on college enrollment frequently limits the analyses to high school graduates or, even more restrictive, to high school graduates who are academically qualified to attend a four-year college or university. Decisions to limit the sample to individuals with particular characteristics "controls" for the effects of those characteristics on the outcome. But such decisions may have other consequences for the interpretation of the findings of quantitative analyses, if the sample selection criteria ignore unmeasured differences between "selected" and "not selected" students. For example, Heller (2004) argues that limiting analyses to high school graduates who are academically qualified to attend college fails to account for possible differences between high school graduates who are and are not academically qualified. The two groups may differ in terms of their attitudes toward college, support and encouragement for college enrollment, and other characteristics. These differences may result in sample selection bias (Becker, 2004; Heller, 2004).

Quantitative researchers must also ensure that all relevant variables are included in the analyses to minimize omitted variable bias. One potential challenge pertains to financial aid variables. The NELS database has no financial aid data for students who do not attend college. But as noted by others (e.g., Becker, 2004; Fitzgerald, 2004; Heller, 2004; St. John, 2004), ignoring the role of financial aid in students' college

enrollment decisions because of the absence of appropriate variables for all individuals may result in biased estimators (Becker, 2004; Heller, 2004). Becker's (2004) econometric analyses show that, since family income and financial aid are negatively related, omitting measures of financial aid from an analysis of college enrollment likely results in a coefficient that underestimates the effects of family income on enrollment.

Researchers using quantitative analyses should also keep in mind at least two other potential statistical dangers: endogeneity and collinearity. Endogeneity involves including in the model a regressor that is not only a predictor of the dependent variable but also predicted by other independent variables in the model (Becker, 2004). For example, analyses that include regressor measures of the steps required to enroll in college (e.g., aspire to college, take the SAT, become "college qualified") in an analysis of college enrollment likely result in endogeneity bias (Becker, 2004; Heller, 2004).

Nonetheless, completely avoiding endogeneity may not be possible, given the complexities of college enrollment processes. For example, in the following text, Ellwood and Kane (2000) allude to potential problems that are associated with endogeneity of test scores and high school grades in an analysis of the relationship between family income and college enrollment:

> Potentially more problematic is the fact that test scores and grades at the time of high school graduation in part reflect students' efforts in preparation for college. To the extent that children from more poorly situated families realize that they are unlikely to go to college and therefore do not work as hard in primary and secondary school to prepare for college, lower scores and grades may actually be capturing some of the effects of parental resources on later college enrollment, obscuring the true impact of parental resources. (p. 289)

Collinearity, defined as high correlation among two or more independent variables, results in inefficient or unreliable estimators (Heller, 2004). Decisions to include related variables should be made based on a careful consideration of the correlation matrix as well as theory and prior research (St. John, 2004). For example, although family income and parents' education are correlated (Heller, 2004), the variables may be measures of theoretically distinct constructs, such as financial resources and knowledge and information about college (Ellwood and Kane, 2000; Perna, 2000). In their analyses of college enrollment, Ellwood and Kane (2000) included family income as a measure of financial resources and parents' education as a measure of "tastes," but noted potential implications

of the overlap between these two measures. Specifically, parents' education may reflect not only tastes for higher education but also a family's long-term financial well-being, thus resulting in a coefficient for family income that underestimates the effect of family income on enrollment. Similarly, family income may reflect both financial resources and tastes (Ellwood and Kane, 2000).

With these caveats in mind, a review of research published since 1990 reveals that much is known about the critical predictors of college predisposition, search, and choice. The following text summarizes what is known from prior research about the key variables in the proposed conceptual model (Figure 3.1).

Demand for Higher Education

Economic theory assumes that academic preparation and achievement not only represent an individual's initial stock of human capital but also influence a prospective student's assessment of future earnings (Catsiapis, 1987). Some (e.g., Cabrera and La Nasa, 2000; Ellwood and Kane, 2000; Perna, 2004c) argue that the single most important predictor of college enrollment is academic preparation.

Academic Preparation. Research has shown that the quality and intensity of the high school curriculum is among the most important predictors of college enrollment (Perna, 2004a). Although some studies show that college enrollment rates are higher for high school students who participate in academic or college preparatory curricular tracks than for other high school students (e.g., Hossler, Braxton, and Coopersmith, 1989; Perna, 2000; St. John, 1991), other research suggests that curricular track is an unreliable measure of academic preparation (Adelman, 1999; Stevenson, Schiller, and Schneider, 1994). Specifically, researchers (Adelman, 1999; Stevenson, Schiller, and Schneider, 1994) have found wide variation in the level of preparation among students in the so-called "academic" curricular tracks.

A better measure of the quality and intensity of academic preparation than curricular track is the highest level of coursework that is completed in particular subjects (Adelman, 1999). Because the hierarchical sequence of courses is clearer for mathematics than for other subjects, some researchers (e.g., Horn, 1998; Perna and Titus, 2004, 2005), measure the quality of academic preparation by the highest level of mathematics coursework that was completed at the time of high school completion (e.g., algebra I and geometry; algebra II; or at least one advanced math

course). Taking at least one advanced mathematics course has been shown to be associated with a higher probability of enrolling in a four-year college or university among students who are at risk of dropping out of high school (Horn, 1998) and among high school graduates (Perna and Titus, 2004, 2005) after controlling for other variables.

Academic Achievement. Prior research also consistently shows that individuals with greater achievement are more likely to: expect to attain higher levels of education (Hossler and Stage, 1992), enroll in either a two-year or four-year college or university (Ellwood and Kane, 2000), enroll in a four-year institution (Ellwood and Kane, 2000; Perna, 2000; Plank and Jordan, 2001; Rouse, 1994), and enroll in a high-cost institution (Hearn, 1988). Academic achievement is measured by test scores in some studies (e.g., Ellwood and Kane, 2000; Perna, 2000; Perna and Titus, 2004, 2005; Plank and Jordan, 2001) and high school grades in other studies (e.g., Ellwood and Kane, 2000; Hossler, Schmit, and Vesper, 1999; Hossler and Stage, 1992).

Supply of Resources

Reflecting human capital theory, the proposed conceptual model assumes that students consider their financial resources when determining the relative benefits and costs of investing in postsecondary education (Becker, 1962). Low levels of financial resources may constrain a family's ability to pay the costs of the investment and consequently realize benefits that exceed the costs.

Family Income. Although the relationship between family income and educational aspirations has not been consistently established, research shows that family income plays an important role in other college-choice outcomes. Some research suggests that family income is unrelated to educational aspirations (Hossler, Schmit, and Vesper, 1999; Hossler and Stage, 1992), whereas other research suggests that family income is positively related to both educational aspirations and stability of aspirations between 8th grade and subsequent grades (Kao and Tienda, 1998). These different findings may be attributable to differences associated with the samples (regional vs. national), the variables taken into account in the analyses, and researchers' and students' understanding of the dependent variable. Regardless, research consistently shows a positive relationship between family income and other indicators including: number of applications submitted (Hurtado *et al.*, 1997), enrollment in either a two-year or four-year institution (Ellwood and Kane, 2000; Hossler, Schmit, and Vesper,

1999; Kane, 1999), enrollment in a four-year institution (Ellwood and Kane, 2000; Perna, 2000), and number of years of schooling completed (Hofferth, Boisjoly, and Duncan, 1998).

With a few exceptions (e.g., Rouse, 1994), research generally shows that the enrollment of individuals with low family incomes is more sensitive to changes in college costs, as measured by tuition, student financial aid, and unemployment rate (Avery and Hoxby, 2004; Heller, 1997; Kane, 1999; Long, 2004a). Based on his comprehensive review and synthesis of prior research, Heller (1997) concluded that, although enrollment generally declines when either tuition increases or financial aid decreases, the effects of high costs are greater among students from low-income families than among other students.

Research also shows a positive relationship between SES, a composite of family income, parents' education, and parents' occupation, and such measures of college choice as application to a four-year institution (Cabrera and La Nasa, 2001) and enrollment in a four-year institution rather than enrollment in a two-year institution or no enrollment (Plank and Jordan, 2001). Based on their review and synthesis of research, Terenzini and colleagues concluded that SES plays a strong positive role in all three of Hossler and Gallagher's three stages: predisposition, search, and actual enrollment. Using data from the NELS:92/94, Plank and Jordan found that the positive observed relationship between the SES and the likelihood of enrolling in a four-year college was only partially explained by differences in other variables, including parent-student discussions about education-related topics, parent-school communication, preparation for college admissions tests, and assistance from the school with applications and financial aid information.

Quantitative researchers must consider whether to use family income or SES in their analyses. SES is typically measured using a composite of several variables including family income, parental education, parental occupation, and indicators of selected items in the home (e.g., daily newspaper, computer, atlas, more than 50 books). Some (Paulsen and St. John, 2002; St. John and Paulsen, 2001) argue that the components of SES should be included as separate variables to develop a clearer understanding of the ways in which particular components influence the college choices of different groups of individuals.

Others (e.g., Adelman, 2002; Perna and Titus, 2004; Terenzini, Cabrera, and Bernal, 2001) argue that a composite measure of SES is more appropriate than separate indicators of family income and parental education for both theoretical and statistical reasons. Although perhaps less commonly emphasized by policymakers than family income, SES has

other advantages. First, unlike income, SES may be considered a measure of wealth, reflecting a long-term and more stable assessment of resources rather than a snapshot at one point in time (Terenzini, Cabrera, and Bernal, 2001). Second, by representing measures other than family income, SES may better reflect an individual's habitus or orientation toward college choice (Perna and Titus, 2004; Terenzini, Cabrera, and Bernal, 2001). Finally, SES has several statistical advantages over family income. In particular, SES is less influenced by inconsistencies among its components, a substantially smaller share of data are missing for SES than family income, and SES is more strongly related to other measures of attainment including occupational status (Adelman, 2002; Terenzini, Cabrera, and Bernal, 2001).

Financial Aid. As Heller (1997) points out, examining the effects of "student financial aid" on college choice is complicated, at least in part, by the number of different programs covered by this label. Student financial aid includes need-based and non-need-based grants, subsidized and unsubsidized loans, work-study, and tuition tax credits. Research shows that an offer of financial aid is an important predictor of college enrollment among high school graduates (Catsiapis, 1987), college applicants (St. John, 1991), and high aptitude high school students (Avery and Hoxby, 2004), regardless of the type of aid (e.g., grant, loan, work; St. John and Noell, 1989).

Research shows that the availability of state need-based financial aid is positively related to the likelihood of enrolling in any type of postsecondary education within two years of graduating from high school (Kane, 1999) and to the likelihood of attending an in-state private four-year or in-state public four-year college or university (Perna and Titus, 2004). Other research (e.g., Dynarski, 2004) suggests that merit-based state aid may also promote college choice. Based on her examination of state-merit aid programs in seven states, Dynarski (2004) concluded that these programs increase the likelihood of enrolling in any type of college or university, increase the likelihood of enrolling at a four-year institution, and reduce the likelihood of enrolling at a public two-year college.

Researchers have begun to examine the effects of other financial resources, such as the federal Hope and Lifelong Learning Tax Credits (e.g., Long, 2004b). Using data from the Current Population Survey, Long (2004b) found that, after controlling for gender, race, age, income, state unemployment rate, and other characteristics, neither the likelihood of enrolling in any type of college nor the likelihood of enrolling in a four-year college were related to the availability of the Hope or Lifelong

Learning Tax Credits. The analyses are limited, however, by the use of cross-sectional rather than longitudinal data.

Expected Benefits

Only a few studies published since 1990 (e.g., Rouse, 1994) have examined the effects of expected monetary benefits on student college choice, and virtually nothing is known about the effects of expected nonmonetary benefits. The limited amount of available recent research suggests that the benefits of higher education may play a greater role in the decision to enroll in a two-year college rather than a four-year institution (Rouse, 1994). Rouse measured expected economic returns to higher education based on the average wages of individuals between the ages of 24 and 54 in the same state who had a high school degree, some college, and a bachelor's degree. She noted, however, that her examination of the relationship between expected earnings and college enrollment may be limited by small variance in the earnings measures.

Comparing differences in benefits between women and men, some researchers (e.g., Ellwood and Kane, 2000; Perna, 2005) speculate that gender differences in benefits may be one cause of the higher observed college enrollment rates for women than for men. After controlling for differences in race/ethnicity and academic ability, Perna (2005) found that the return to attaining a bachelor's degree rather than a high school diploma was higher for women than for men in terms of several economic and noneconomic benefits. Specifically, net of test scores, women averaged higher annual incomes and greater likelihood of health insurance coverage, as well as reduced likelihood of smoking and increased likelihood of regularly voting.

Expected Costs

Although a central part of human capital models, expected costs of an investment in higher education have generally only been included in examinations of the third stage of the process, actual enrollment. Little is known about the relationship between college costs and earlier stages of the college-choice process.

College Costs. In order to identify more specific recommendations for public and institutional policy, researchers typically include separate measures of tuition and financial aid, rather than a composite measure of net price (e.g., Ellwood and Kane, 2000; Heller, 1997). A common proxy for tuition is the average tuition at public two-year colleges in the student's

home state (Ellwood and Kane, 2000; Kane, 1999; Rouse, 1994). Using data from the NELS:88/94 and controlling for race, parents' education, family income, test scores, and other variables, Kane (1999) found that the probability of enrolling in any type of postsecondary education institution was more sensitive to changes in tuition at public two-year institutions than changes in tuition at public four-year institutions.

Both the likelihood of enrolling in college (e.g., Avery and Hoxby, 2004; Kane, 1999, 2004) and the type of college in which a student enrolls (e.g., Perna and Titus, 2004) are related to tuition. Research shows that enrollment at public colleges and universities within a state declines when tuition increases (Heller, 1999; Kane, 1999), and that changes in tuition have a greater effect on enrollment at public two-year colleges than on enrollment at public four-year institutions (Heller, 1999; Kane, 1999; Rouse, 1994). Other research suggests that differences in tuition across sectors may influence the type of college or university in which students enroll (Perna and Titus, 2004).

Foregone Earnings. Foregone earnings, or the earnings that individuals would earn if they worked rather than enrolled in college, are a substantial cost of enrollment, especially for low-income students (Kane, 1999). A common proxy for foregone earnings, or the opportunity costs of attending college, is the state or county unemployment rate (e.g., Heller, 1999; Kane, 1999; Long, 2004a; Rouse, 1994). As the unemployment rate increases, foregone earnings (i.e., opportunity costs) are assumed to decline, and the likelihood of enrolling is assumed to increase. With some exceptions (e.g., Berger and Kostal, 2002), research generally supports this notion, showing a positive relationship between the unemployment rate and the probability that a student will attend a two-year or four-year institution (Long, 2004a; Rouse, 1994) and the unemployment rate and enrollment in public colleges and universities in a state (Heller, 1999).

Background Characteristics

Gender. Since the mid 1990s, college enrollment rates have been higher for women than for men. In 1967, only 25% of women high school completers between the ages 18 and 24 were enrolled in college, compared with 45% of men. During the 1970s, enrollment rates for men and women converged at about 30%. Beginning in the late 1980s, enrollment rates for both women and men began to rise, but at a faster rate for women than men. In 2001, 46% of women and 42% of men high school completers aged 18–24 were enrolled in college (NCES, 2004). Although women continue to be relatively underrepresented among recipients of bachelor's

degrees in such fields as engineering, computer and information sciences, and physical sciences, the share of women earning degrees in these disciplines has increased substantially over the past three decades (Freeman, 2004).

Despite these trends, few researchers have focused on differences in college choice based on gender. The available research suggests that the relationship between gender and college-choice outcomes is ambiguous. Some research shows that, net of other variables, educational expectations are higher for girls (Hossler and Stage, 1992), while other research shows higher educational expectations for boys (Hao and Bonstead-Bruns, 1998). Similarly, some studies show that women and men are equally likely to enroll in college after taking into account other variables (Perna, 2000), but other research shows that women are more likely than men to enroll in both two-year and four-year colleges and universities (e.g., Perna and Titus, 2005) and in-state public two-year institutions, in-state public four-year institutions, in-state private four-year institutions, and out-of-state institutions (e.g., Perna and Titus, 2004) in the fall after graduating from high school.

Some research suggests that the college-choice process is different for women than for men (e.g., Stage and Hossler, 1989). Using a sample of 9th grade students attending Indiana high schools in 1986–87, Stage and Hossler (1989) found that educational aspirations increased with the frequency of parent-child discussions about college for women, but were unrelated for men. Parental savings for college were lower for women, but not for men, when other children in the family were already enrolled in college.

Race/Ethnicity

A review of research published in the last 15 years shows increased attention to understanding racial/ethnic group differences in college choice. Taken together, the research shows differences in both the outcomes and the processes of college choice across racial/ethnic groups.

A few studies (e.g., Hurtado *et al.*, 1997; St. John and Noell, 1989) show that, after controlling for other variables, college-choice outcomes are lower for African-Americans than for Whites. For example, St. John and Noell (1989) found college enrollment rates to be lower for African-American college applicants than for Whites after controlling for background, ability, educational aspirations, and financial aid offers. Other

research shows that, compared with their White counterparts and after controlling for other differences, African-American high school students are less likely to attend their first-choice institution (Hurtado *et al.*, 1997).

Nonetheless, most recent research suggests that, after taking into account other variables, college outcomes are higher for African-Americans than for Whites. Net of other differences African-Americans have higher educational aspirations in the 8th grade and less change in aspirations during subsequent years of high school (Kao and Tienda, 1998), they submit a higher number of college applications than Whites (Hurtado *et al.*, 1997) and are more likely than Whites to enroll in college (Catsiapis, 1987; Kane and Spizman, 1994; Perna, 2000; Plank and Jordan, 2001), enroll in four-year rather than two-year college (Plank and Jordan, 2001; Rouse, 1994), and attend a higher-cost rather than lower-cost institution (Hearn, 1988). Perna and Titus noted that observed college enrollment rates are lower for African-Americans and Hispanics than for Whites because they possess less of the types of economic, human, cultural, and social capital that are valued in the college enrollment process, and because of the low levels of resources that are available at the school attended to promote college enrollment.

Less is known about differences in college-choice outcomes among other racial/ethnic groups. Some research suggests that, after controlling for other variables, Hispanics are as likely as Whites to enroll in a four-year college after graduating from high school (Perna, 2000), while other research using the same database but controlling for somewhat different variables suggests that Hispanics are more likely than Whites to attend a four-year college than to enroll full-time in a two-year college or never enroll in college (Plank and Jordan, 2001).

Research also suggests that student-college-choice processes vary across racial/ethnic groups (Heller, 1997; Hossler, Schmit, and Vesper, 1999; Perna, 2000; Perna and Titus, 2005). Based on his review and synthesis of prior research, Heller (1997) concluded that changes in tuition and state grant expenditures appear to have a larger impact on the enrollment of Asians, African-Americans, and Hispanics than of Whites. Hossler, Schmit, and Vesper (1999) concluded that their model explained less of the variance in educational aspirations for African-American men than for other Indiana high school students. Using data from the NELS:92/94, Perna (2000) found that, among 1992 high school graduates, measures of cultural and social capital made a relatively greater contribution to a traditional human capital model of four-year college enrollment for African-Americans and Hispanics than for Whites.

Cultural Capital

Cultural capital, a symbolic good, may provide students with access to resources that promote college-related behaviors and outcomes (McDonough, 1997). Cultural capital may be manifested in terms of cultural knowledge and the value placed on college attainment.

Cultural Knowledge. Students who possess the types of cultural knowledge that the dominant class values have greater access to the resources that promote college choice (McDonough, 1997). In her qualitative study, McDonough shows that aspects of students' search processes (e.g., number and nature of college visits, questions asked of college representatives) vary based on students' SES. She argues that students from high-SES families have more productive and sophisticated search processes than students from low-SES families, at least in part, because they are more likely to have had experience in similar situations.

Perhaps reflecting the limitations of quantitative indicators of such complex constructs, quantitative research examining the effects of cultural knowledge on college outcomes shows mixed results. When measured as a composite of cultural activities, attitudes, and knowledge, cultural capital has been shown to increase the frequency of interactions about postsecondary plans between high school students and "high-status" individuals, such as teachers, school counselors, and peers (DiMaggio and Mohr, 1985). Nonetheless, other research shows that an indicator of whether the student attends a music, art, or dance class at least once a week is unrelated to enrollment in either a two-year or four-year college or university in the fall after graduating from high school among 1992 high school graduates after controlling for other student- and school-level predictors (Perna and Titus, 2005).

Value of College Attainment. Parents' educational attainment may be a proxy for both cultural knowledge and values about higher education (McDonough, 1997; Perna and Titus, 2004). Research consistently shows that parental education is an important positive predictor of a variety of college-choice outcomes including educational aspirations and plans (Hossler, Schmit, and Vesper, 1999; Hossler and Stage, 1992; Kao and Tienda, 1998; Stage and Hossler, 1989), enrollment in either a two-year or four-year college (Ellwood and Kane, 2000; Hossler, Schmit, and Vesper, 1999; Perna and Titus, 2005; Rouse, 1994), enrollment in a four-year institution (Ellwood and Kane, 2000; Perna, 2000; Perna and Titus, 2005), distance from home of preferred college options (McDonough, 1997), and number of years of schooling completed (Hofferth, Boisjoly, and Duncan, 1998).

The value placed on higher education may also be measured by parental encouragement for college enrollment. Based on their longitudinal study of Indiana high school students, Hossler, Schmit, and Vesper (1999) concluded that parental encouragement is the single most important predictor of students' planning to pursue postsecondary education. When measured as parents' expectations for their child's educational attainment, parental encouragement is one of the strongest positive predictors of students' educational plans (Hamrick and Stage, 2004; Hossler and Stage, 1992; Stage and Hossler, 1989) and may be particularly important to African-American students' educational aspirations (Hamrick and Stage, 2004). Parents' expectations are also positively related to the probability of enrolling in college in the fall after graduating from high school (Perna, 2000; Perna and Titus, 2004). Some research suggests that high parental encouragement may raise students' educational aspirations without producing aspirations that are aligned with occupational aspirations (Schneider and Stevenson, 1999). Parents may promote "aligned ambitions" by ensuring that their children learn the relationship between educational and occupational aspirations and encouraging their children to make choices that will facilitate attainment of their aspirations (Schneider and Stevenson, 1999).

Social Capital

Coleman's (1988) conceptualization of social capital suggests that parental involvement is a form of social capital that may promote college enrollment because of the relationships between a student and her/his parents, between the student's parents and the school officials, and between the student's parents and the student's friends' parents. The availability of the types of social capital that promote college choice may be manifested through information about college and assistance from school officials with college-choice processes.

Information About College. As transmitters of social capital (González, Stone, and Jovel, 2003), parents play a critical role in students' college-choice processes. One way parents promote college choice is through their involvement in their children's education. Research consistently shows that the probability of enrolling in a two-year or a four-year college or university in the fall after graduating from high school increases with the frequency of parent-student discussions about education issues (Perna, 2000; Perna and Titus, 2005; Plank and Jordan, 2001). Using data from the NELS:88, Hao and Bonstead-Bruns (1998) found that both the levels of, and likelihood of agreement between, parents' and children's educational

expectations increase with parental involvement in their children's learning activities.

Parental knowledge and information that promote college enrollment may also be reflected by, and acquired via, parental contact with the school about education-related matters. Some research suggests that the likelihood of enrolling in a two-year or a four-year institution increases with the frequency of parental contact with the school about volunteering, as well as the frequency of parent-initiated contact with the school about such academic matters as academic performance, academic program, plans after high school, and college preparatory course selection (Perna and Titus, 2005).

Other studies attempt to model the effects of the characteristics of parents' social networks on college choice. Parent-to-parent involvement, an indicator of intergenerational closure, may be measured by the number of the student's friends' parents with whom a parent reports talking (Perna and Titus, 2005). However, after controlling for other student- and school-level variables, this indicator was unrelated to the probability of enrolling in either a two-year or four-year college in the fall after graduating from high school (Perna and Titus, 2005). Using data from the Panel Study of Income Dynamics, Hofferth, Boisjoly, and Duncan (1998) found that both the number of years of schooling completed and the likelihood of attending college were positively related to whether parents had a friend or relative whom the parent could ask for assistance in the form of time or money (a measure of the nature of social networks). But this positive relationship held only for individuals from high-income families, suggesting that social networks are more beneficial for those with high incomes than for those with low incomes (Hofferth, Boisjoly, and Duncan, 1998).

Peers may also transmit necessary social capital. Research shows that students are more likely to plan to attend a selective four-year institution (González, Stone, and Jovel, 2003) and enroll in college (Hossler, Schmit, and Vesper, 1999; Perna and Titus, 2005) when their friends plan to attend college. Having friends with high educational expectations may be especially effective in raising the educational expectations of low-SES students (McDonough, 1997). Students may also acquire information about college through their involvement with peers in high school activities (Hossler and Stage, 1992).

By interrupting a parent's relationships with other parents and school officials, geographic mobility may disrupt the transmission of social capital (Hofferth, Boisjoly, and Duncan, 1998). When measured as the number of times that a student's family moved between the student's 8th and 12th

grades, disruptions to social capital have been shown to reduce the likelihood of enrolling in either a two-year or four-year institution, rather than not enrolling in the fall after graduating from high school after controlling for other student- and school-level variables (Perna and Titus, 2004).

Assistance with College Processes. Counselors and teachers may also transmit necessary college-related social capital to students. Counselors and teachers at the school attended are potential sources of encouragement to attend college and assistance with college-choice processes (González, Stone, and Jovel, 2003; McDonough, 1997; Perna, 2000). High school counselors and teachers may also play a role in defining postsecondary education as an acceptable and viable option for students (McDonough, 1997). Some research suggests that support from counselors and teachers may play a relatively more important role in shaping students' actual postsecondary educational decisions, such as the choice of college to attend, than in the formation of students' predisposition toward college (Hossler, Schmit, and Vesper, 1999).

School and Community Context

The proposed conceptual model (Figure 3.1, layer 2) incorporates Bourdieu's (1986) and Lin's (2001a,b) assumptions that an individual's behavior cannot be understood except in terms of the social context in which the behavior occurs. In addition to describing the effects of families, friends, and other influences on student college choice, McDonough (1997) demonstrates the ways in which schools define student college choice through various organizational structures.

Both qualitative (McDonough, 1997; Mintrop *et al.*, 2004; Schneider and Stevenson, 1999) and quantitative (Perna and Titus, 2005) research shows that aspects of the school context shape college choice. Schneider and Stevenson found that the percentage of students whose educational aspirations matched their occupational aspirations was higher in high schools that assisted students with planning their high school curricular choices, urged students to consider their career aspirations when making high school curricular choices, and ensured the availability of high school staff who were knowledgeable about curricular requirements and paths. McDonough (1997) showed that the school guidance process influenced student college choice through the quantity and quality of information provided, as well as the postsecondary options that counselors encouraged and discouraged. A high school's orientation toward college was communicated to students, at least in part, through the organization

of guidance, including the amount of time counselors devoted to college counseling, and the school's mission and structure of the curriculum (e.g., whether college preparation is the "default" curricular track). Other research (Mintrop *et al.*, 2004) demonstrates the negative consequences of college advising that result, in part, from high ratios of students to counselors and the absence of college-related expertise among teachers beyond their personal experiences.

Other structural characteristics of the school attended shape student college choice. Based on life history analyses of 22 Latinas, González, Stone, and Jovel (2003) conclude that participation in a gifted and talented program results in substantial advantages in terms of the type of college attended, especially when compared to participation in a general curricular program, English as a second language track, or special education track. Advantages include access to more rigorous curricula, more encouraging teachers, more involved guidance counseling, and additional supplemental programs and services.

Quantitative research has also begun to examine the ways in which the family, school, and community context influence student college choice (e.g., Perna and Titus, 2005). Using multilevel modeling, Perna and Titus found that college enrollment rates are positively related to the volume of economic, cultural, and social capital that is available through social networks at the school attended. They measured quantities of resources by the average levels of various student-level measures (e.g., family income, parental education, and parental involvement) for students at the same school.

Higher Education Context

As suggested by the proposed conceptual model (Figure 3.1, layer 3), research suggests that various characteristics of the higher education context also influence student college choice. While earlier research examined the effects of institutional marketing on student college choice (e.g., Chapman, 1981), more recent research points to the roles of institutional location, characteristics, and competition.

Researchers have assumed that both region (McDonough, Antonio, and Trent, 1997; Perna, 2000; St. John, 1991) and high school location (Catsiapis, 1987; Rouse, 1994) reflect variations in the availability of information related to the presence of HBCUs and the relative concentration of colleges, respectively. Others (Hearn, Griswold, and Marine, 1996; Perna and Titus, 2004) assume that region is a proxy for unmeasured differences

in a region's tradition and philosophy toward both higher and K-12 education. The composition of a state's higher education system (e.g., availability of different types of colleges and universities) contributes to the distribution of students at different types of colleges and universities in a state (Perna *et al.*, 2005; Perna and Titus, 2004). The capacity of a state's higher education system also appears to matter, as some research shows that a state's college enrollment rates increase with the shares of students enrolled in public two-year institutions and private institutions net of other variables (St. John *et al.*, 2004). Competition for enrollment at elite institutions is one cause of the increased use of private college counselors, especially among students with high SES (McDonough, 1997).

Social, Economic, and Policy Context

The proposed conceptual model (Figure 3.1, layer 4) also assumes that student college choice is shaped by the social, economic, and policy context. The social context may include demographic characteristics of the population, while the economic context may include characteristics of the local labor market, and the policy context may include policies and structures that discourage, or encourage, college enrollment.

Social Context. A review of research shows limited attention to the effects of the social context on student college choice. Moreover, the available research shows conflicting results about the roles of such measures as educational attainment of the population. In their state-level analysis of college enrollment rates, St. John *et al.* (2004) found that state college enrollment rates were positively associated with the percentage of the population that held at least a bachelor's degree and negatively associated with the state poverty rate and the share of Hispanics in the population. Using multilevel analyses, Perna and Titus (2004) found that the share of the population with a bachelor's degree was unrelated to college enrollment, net of other variables.

Economic Context. As described above, unemployment rates are typically used as proxies for the foregone earnings of an investment in higher education. Some qualitative research (e.g., Bettis, 1996) suggests the contribution of considering additional aspects of the economic context. Bettis (1996) used the anthropological and sociological construct of liminality to explore the ways in which the macroeconomic context and other social changes influence the educational aspirations of students attending one high school. The school was located in an urban area that was undergoing

changes associated with a shift from industrial to postindustrial economy, including the disappearance of good-paying jobs that required no education beyond high school. The analyses suggest that, because of the changes in the economic and social conditions of their community, many high school students are uncertain and anxious about their future lives, including work- and college-related outcomes.

Policy Characteristics. Although economists have traditionally included such measures of public policies as student financial aid and tuition in analyses of college enrollment, the proposed conceptual model suggests that a broader range of policies also influence student college choice. A review of recent research supports this assumption.

For example, some recent research (Perna and Titus, 2004; St. John, Musoba, and Chung, 2004; Venezia, Kirst, and Antonio, 2003) suggests the importance of considering the effects of K-12 educational policies when examining student college choice. Using multilevel analyses, Perna and Titus (2004) show that aspects of K-12 education, including a state-level indicator of K-12 resources, influence the likelihood of college enrollment for high school graduates. Based on case studies of selected regions within six states, Venezia and colleagues concluded that the lack of alignment between K-12 and postsecondary education in terms of curricular requirements and assessments likely reduces students' educational aspirations. One consequence of the lack of alignment is that, in many states, a student may fulfill the curricular requirements for graduating from high school but not for entering a public four-year college (Venezia, Kirst, and Antonio, 2003). Fixed-effects regression analyses by St. John, Musoba, and Chung suggest that K-12 educational reforms indirectly reduce college enrollment through their effects on high school graduation rates, but indirectly increase college enrollment through their effects on academic preparation.

Research also demonstrates that affirmative action policies influence student college enrollment behavior. Using a random sample of 10% of SAT I test-takers for each year between 1996 and 2000, Long (2004c) found that the number of SAT score reports sent to selective in-state public institutions in California and Texas by African-Americans and Hispanics declined during the late 1990s after the elimination of affirmative action in these states net of other variables. During the same period, Asians and Whites sent more of their score reports to selective in-state public institutions and fewer to nonselective in-state public institutions. Other research examines the effects of state responses to changes in affirmative action, including percent plans (e.g., Horn and Flores, 2003).

DIRECTIONS FOR FUTURE RESEARCH

In addition to enhancing examinations of the sources of observed gaps in college choice described in the introduction, the proposed conceptual model may also be useful for addressing some of the understudied aspects of student college choice. Although numerous studies have been published on some aspect of college choice, much is still unknown. In particular, the proposed conceptual model should be used to guide examinations of: (1) additional dimensions of the college-choice process, (2) the experiences of more narrowly defined populations, and (3) the effectiveness of policies and programs that are designed to promote college access and choice.

DIMENSIONS OF THE COLLEGE-CHOICE PROCESS

This review of research shows that multiple dimensions of college-choice merit investigation. Although Hoxby (2004) discounts access as an important area of future research, persisting gaps in college enrollment across socioeconomic and racial/ethnic groups suggest that more needs to be known about the most effective ways of promoting college access for all groups. As noted by Hoxby (2004) and others, more also needs to be known about other aspects of the college-choice process, including the types of colleges attended, the timing of enrollment, and the consequences of different enrollment decisions, as well as variations in these outcomes across different groups.

For example, little is known about the process of deciding to enroll in a less than four-year postsecondary educational institution. Some researchers (e.g., Perna, 2000) define enrollment as attending a four-year college or university (yes or no) only, arguing that the predictors of four-year enrollment are likely different than the predictors of enrolling in a less than two-year institution and that the expected monetary and nonmonetary benefits of enrolling likely vary based on type of institution attended. Nonetheless, as others (e.g., Heller, 2004) note, by ignoring enrollment in a two-year or less than two-year institution, researchers fail to examine a substantial percentage of the postsecondary enrollment decisions.

Additional research is also required to understand the timing of the enrollment decision (Hoxby, 2004). Likely reflecting the design of such large-scale national databases as the NELS, virtually all recent research examines the experiences of traditional-age students transitioning immediately from high school to college. Although others (e.g., Hossler, Braxton, and Coopersmith, 1989; Paulsen, 1990; Paulsen and St. John,

2002; St. John and Asker, 2001) have noted the paucity of research on nontraditional enrollment, little is known about the experiences of students who delay entry into college beyond one or two years of graduating from high school, or the decision of students to enroll in less than four-year institutions, including community colleges and proprietary schools.

With its assumption of multiple possible paths, the proposed conceptual model may be appropriate for understanding the decision to enroll in a less-than-four-year institution and the college-choice processes of students who enroll in college more than two years after completing high school. In fall 2001, one third (32%) of all undergraduates was over the age of 24%, and 39% of all undergraduates were enrolled part-time rather than full-time (NCES, 2004). Clearly, focusing only on the college-choice processes of individuals who enroll full-time in a four-year college immediately after graduating from high school ignores a substantial portion of the college-going population. Many of the variables (e.g., parental encouragement) that are suggested for the proposed conceptual model are likely relevant only to traditional college choice. However, the broader elements of the proposed conceptual model may be useful for examining nontraditional student college choice. Future research should test the appropriateness of the proposed conceptual model for examining nontraditional college enrollment.

Experiences of More Narrowly Defined Populations

Although prior research suggests that college-choice processes vary by race/ethnicity and family income, more needs to be learned about variations in college choice across groups (Paulsen and St. John, 2002; St. John, Paulsen, and Carter, 2005). Although qualitative methods are becoming more common, prior research on college choice continues to be dominated by quantitative studies using large-scale national databases. Consequently, little is known about the experiences of groups that are typically represented by small numbers of students in any particular sample. For example, reflecting their small numbers in the U.S. population, such national databases as the NELS include too few American Indians/Alaskan Natives for detailed examinations of their college-choice decisions and behaviors.

In addition, with only a few exceptions (e.g., Hao and Bonstead-Bruns, 1998), researchers have largely ignored variations in the experiences of groups within the "Asian" and "Hispanic" categories. Qualitative research may be most appropriate for probing the experiences of

these more narrowly defined groups, as suggested by Ceja's (2001) study of 20 first-generation Chicanas who attended one large, inner-city high school. Among other findings, Ceja's study highlights the complex ways in which parents communicate messages to their children about the importance of college even when parents lack knowledge about college-choice processes.

Future research should also examine the ways in which race/ethnicity intersects with income, SES, and/or gender to influence college-choice decisions and behaviors. Several recent studies begin to examine sex differences within racial/ethnic groups (e.g., Kao and Tienda, 1998; McDonough *et al.*, 2004; Hamrick and Stage, 2004; Zarate and Gallimore, 2004). As an example, Zarate and Gallimore (2004) explore the experiences of Latinas and Latinos through a 15-year longitudinal study that tracks students from kindergarten through one year after high school graduation. Other research begins to examine the intersection of race and income, exploring the college-related decisions of low-income African-Americans (DeLarge, 2003).

EFFECTIVENESS OF POLICIES AND PROGRAMS DESIGNED TO PROMOTE COLLEGE CHOICE

The proposed conceptual model should also be used to guide examinations of the effectiveness of policies and programs in increasing college access and choice. Among the policies and programs that warrant regular attention of researchers are affirmative action, student financial aid programs, and precollege outreach programs.

Regular research on the effects of public policies on college choice is required, at least in part, because of continual changes not only in aspects of the policies and programs but also in the social, economic, and political context that shapes the effectiveness of the policies and programs. Research shows that the effects of particular policy variables on college choice change over time. For example, using data from the NLS of the class of 1972, High School and Beyond Longitudinal Study of 1982 high school seniors, and NELS, Long (2004a) found variations across the three cohorts in the predictors of college enrollment. Long (2004a) showed that the magnitude of the negative effect of tuition on enrollment declined between 1972 and 1982, and declined again between 1982 and 1992.

The relevance of prior research on the effectiveness of student financial aid is limited by continual changes in both the criteria to receive the aid and the characteristics of particular aid programs. Since the 1980s,

the share of student financial aid awards in the form of loans has increased faster than the share of aid in the form of grants (The College Board, 2004). In addition, the emphasis of federal and state student financial aid programs has shifted over time, away from reducing financial barriers to college attendance for low-income students toward increasing the affordability of college for middle-income students. This shift is indicated by the increased consideration of characteristics other than financial need in awarding student aid, the establishment of federal nonrefundable tax credits, and the establishment of state-sponsored prepaid tuition and college savings plans (The College Board, 2004; Thomas and Perna, 2004).

Examinations of the effectiveness of policies and programs should also include attention to differences in effectiveness across groups. Moreover, effectiveness of particular policies and programs (e.g., student financial aid) should be assessed in terms of a broad range of student-college-choice outcomes including not only actual enrollment but also aspirations, academic preparation, search for information, applications, and type of college attended (Clotfelter, 2004; St. John and Asker, 2001).

CONCLUSION

College-choice outcomes are part of a broader educational pipeline. Some (e.g., Venezia, Kirst, and Antonio, 2003; Turner, 2004) argue that policymakers should be most concerned not with access to college, but with success in college. By focusing on research designed to close gaps in college access, this chapter is not intended to minimize the need for attention to closing gaps in college persistence. Attention to improving equity in college completion is also important, as some data suggest that college participation rates increased faster than college completion rates for individuals born between 1960 and 1980, and that the gap between participation and completion rates was especially large for Blacks (Turner, 2004).

Nonetheless, although college completion is critical to fully realizing the public and private benefits of higher education and achieving equity in higher education opportunity, degree attainment is not possible without "college choice." Moreover, as some researchers demonstrate (e.g., Paulsen and St. John, 2002), college choice has an impact on student persistence. In their "financial nexus model," Paulsen and St. John (2002) show that student persistence is influenced not only by the actual amounts of financial aid that a student receives but also by a student's perceptions of the importance of college costs in the college-choice process.

Through additional research in the areas described in this chapter, using the proposed conceptual model, researchers will help inform institutional leaders and public policymakers about the most effective approaches for closing gaps in college-choice outcomes.

ACKNOWLEDGMENT

I am grateful to Michael Paulsen for his very helpful assistance with the preparation of this manuscript.

References

Adelman, C. (2002). The relationship between urbanicity and educational outcomes. In W.G. Tierney and L.S. Hagedorn (eds.), *Increasing Access to College: Extending Possibilities for All Students* (pp. 35–64). Albany, NY: State University of New York Press.

Adelman, C. (1999). *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment*. Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

Advisory Committee on Student Financial Assistance. (2002). *Empty Promises: The Myth of College Access in America*. Washington, DC: Author.

Avery, C., and Hoxby, C.M. (2004). Do and should financial aid packages affect students' college choices? In C.M. Hoxby (ed.), *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It* (pp. 239–302). Chicago: University of Chicago Press.

Avery, C., and Kane, T.J. (2004). Student perceptions of college opportunities: The Boston COACH Program. In C.M. Hoxby (ed.), *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It* (pp. 355–394). Chicago: University of Chicago Press.

Baum, S., and Payea, K. (2004). *Education Pays 2004: The Benefits of Higher Education for Individuals and Society*. Washington, DC: The College Board.

Becker, G.S. (1993). *Human capital: A theoretical and empirical analysis with special reference to education* (3rd edition). Chicago: University of Chicago Press.

Becker, G.S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy* 70(5): 9–49.

Becker, W.E. (2004). Omitted variables and sample selection in studies of college-going decisions. In E.P. St. John (ed.), *Public Policy and College Access: Investigating the Federal and State Roles in Equalizing Postsecondary Opportunity* (Vol. 19, pp. 65–86). New York: AMS Press, Inc.

Berger, M.C., and Kostal, T. (2002). Financial resources, regulation, and enrollment in US public higher education. *Economics of Education Review* 21: 101–110.

Bettis, P.J. (1996). Urban students, liminality, and the postindustrial context. *Sociology of Education* 69: 105–125.

Betts, J.R. (1996). What do students know about wages? Evidence from a survey of undergraduates. *Journal of Human Resources* 31: 27–56.

Bourdieu, P. (1986). The forms of capital. In J.G. Richardson (ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241–258). New York: Greenwood Press.

Bourdieu, P., and Passeron, J.C. (1977). *Reproduction in Education, Society, and Culture*. Beverly Hills, CA: Sage Publications.

Bourdieu, P., and Wacquant, L.J.D. (1992). *An Invitation to Reflexive Sociology*. Chicago: University of Chicago Press.

Bowen, H.R. (1997). *Investment in Learning: The Individual and Social Value of American Higher Education*. Baltimore: Johns Hopkins University Press.

Cabrera, A.F., and La Nasa, S.M. (2001). On the path to college: Three critical tasks facing America's disadvantaged. *Research in Higher Education* 42: 119–149.

Cabrera, A.F., and La Nasa, S.M. (2000). Three critical tasks America's disadvantaged face on their path to college. In A.F. Cabrera and S.M. La Nasa (eds.), *Understanding the college choice of disadvantaged students* (Vol. 107, pp. 23–29). San Francisco: Jossey-Bass.

Carnevale, A.P., and Desrochers, D.M. (2003). *Standards for What? The Economic Roots of K-16 Reform*. Princeton, NJ: Educational Testing Service.

Catsiapis, G. (1987). A model of educational investment decisions. *Review of Economics and Statistics* 69: 33–41.

Ceja, M.A. (2001). *Applying, Choosing, and Enrolling in Higher Education: Understanding the College Choice Process of First-Generation Chicana Students*. Unpublished doctoral dissertation. University of California, Los Angeles.

Chapman, D.W. (1981). A model of student college choice. *The Journal of Higher Education* 52(5): 490–505.

Clotfelter, C. (2004). Comment. In C.M. Hoxby (ed.), *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It* (pp. 97–100). Chicago: University of Chicago Press.

Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology* 94(Supplement): 95–120.

The College Board. (2004). *Trends in Student aid 2004*. Washington, DC: Author.

Creswell, J.W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (2nd edition). Thousand Oaks, CA: Sage Publications.

DeLarge, M.P. (2003). *African American High School Students from Low Income Families and Their Decision Making Process to Participate in Higher Education*. Unpublished doctoral dissertation. University of New Orleans.

DesJardins, S.L., Ahlburg, D.A., and McCall, B.P. (in press). An integrated model of application, admission, enrollment and financial aid. *The Journal of Higher Education*.

DesJardins, S.L., and Toutkoushian, R.K. (2005). Are students really rational? The development of rational thought and its application to student choice. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 20, pp. 191–240). Dordrecht, The Netherlands: Kluwer Academic Publishers.

Dika, S.L., and Singh, K. (2002). Applications of social capital in educational literature: A critical synthesis. *Review of Educational Research* 72: 31–60.

DiMaggio, P., and Mohr, J. (1985). Cultural capital, educational attainment, and marital selection. *American Journal of Sociology* 90: 1231–1261.

Dominitz, J., and Manski, C.F. (1996). Eliciting student expectations of the returns to schooling. *Journal of Human Resources* 31: 1–25.

Dynarski, S. (2004). The new merit aid. In C.M. Hoxby (ed.), *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It* (pp. 63–100). Chicago: University of Chicago Press.

Ellwood, D.T., and Kane, T.J. (2000). Who is getting a college education? Family background and the growing gaps in enrollment. In S. Danziger and J. Waldfogel (eds.), *Securing the Future: Investing in Children from Birth to College* (pp. 283–324). New York: Russell Sage Foundation.

Fatima, N., and Paulsen, M.B. (2004). Higher education and state workforce productivity in the 1990s. *Thought and Action: NEA Higher Education Journal* 20(1): 75–94.

Fitzgerald, B. (2004). Federal financial aid and college access. In E.P. St. John (ed.), *Public Policy and College Access: Investigating the Federal and State Roles in Equalizing Postsecondary Opportunity* (Vol. 19, pp. 1–28). New York: AMS Press, Inc.

Freeman, C.E. (2004). *Trends in Educational Equity of Girls and Women: 2004*. Washington, DC: National Center for Education Statistics (NCES 2005-016).

Freeman, K. (1997). Increasing African Americans' participation in higher education: African American high-school students' perspectives. *The Journal of Higher Education* 68(5): 523–550.

Furstenberg, F.F., Cook, T.D., Eccles, J., Elder, G. H., and Sameroff, A. (1999). *Managing to Make It: Urban Families and Adolescent Success*. Chicago: University of Chicago Press.

Gall, M.D., Borg, W.R., and Gall, J.P. (1996). *Educational Research: Introduction*. White Plains, NY: Longman Publishing.

Gladieux, L., and Swail, W.S. (1999). Financial aid is not enough: Improving the odds for minority and low-income students. In J.E. King (ed.), *Financing a College Education: How it Works, how It's Changing* (pp. 177–197). Phoenix, AZ: Oryx Press.

González, K.P., Stone, C., and Jovel, J.E. (2003). Examining the role of social capital in access to college for Latinas: Toward a college opportunity framework. *Journal of Hispanic Higher Education* 2: 146–170.

Grodsky, E., and Jones, M. (2004). *Real and imagined barriers to college entry: Perceptions of cost*. Paper presented at the annual meeting of the American Education Research Association, San Diego, CA.

Hamrick, F.A., and Hossler, D. (1996). Diverse information-gathering methods in the postsecondary decision-making process. *Review of Higher Education* 19(2): 179–198.

Hamrick, F.A., and Stage, F.K. (2004). College predisposition at high-minority enrollment, low-income schools. *Review of Higher Education* 27(2): 151–168.

Hao, L., and Bonstead-Bruns, M. (1998). Parent-child differences in educational expectations and the academic achievement of immigrant and native students. *Sociology of Education* 71(3): 175–198.

Hearn, J.C. (1988). Attendance at higher-cost colleges: Ascribed, socioeconomic, and academic influences on student enrollment patterns. *Economics of Education Review* 7: 65–76.

Hearn, J.C. (1984). The relative roles of academic, ascribed, and socioeconomic characteristics in college destinations. *Sociology of Education* 57: 22–30.

Hearn, J.C., Griswold, C.P., and Marine, G.M. (1996). Region, resources, and reason: A contextual analysis of state tuition and student aid policies. *Research in Higher Education* 37(3): 241–278.

Heller, D.E. (2004). NCES Research on college participation: A critical analysis. In E.P. St. John (ed.), *Public Policy and College Access: Investigating the Federal and State Roles in Equalizing Postsecondary Opportunity* (Vol. 19, pp. 29–64). New York: AMS Press, Inc.

Heller, D.E. (1999). The effects of tuition and state financial aid on public college enrollment. *Review of Higher Education* 23(1): 65–89.

Heller, D.E. (1997). Student price response in higher education: An update to Leslie and Brinkman. *The Journal of Higher Education* 68: 624–659.

Hofferth, S.L., Boisjoly, J., and Duncan, G.J. (1998). Parents' extrafamilial resources and children's school attainment. *Sociology of Education* 71: 246–268.

Horn, C.L., and Flores, S.M. (2003). *Percent Plans in College Admissions: A Comparative Analysis of Three States' Experiences*. Cambridge, MA: Civil Rights Project, Harvard University.

Horn, L.J. (1998). *Confronting the Odds: Students at Risk and the Pipeline to Higher Education*. Report No. NCES 98-094. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

Horvat, E.M. (2001). Understanding equity and access in higher education: The potential contribution of Pierre Bourdieu. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 16, pp. 158–171). New York: Agathon Press.

Hossler, D., Braxton, J., and Coopersmith, G. (1989). Understanding student college choice. In J. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. V, pp. 231–288). New York: Agathon Press.

Hossler, D., and Gallagher, K.S. (1987). Studying college choice: A three-phase model and the implications for policy-makers. *College and University* 2: 207–221.

Hossler, D., Schmit, J., and Vesper, N. (1999). *Going to College: How Social, Economic, and Educational Factors Influence the Decisions Students Make*. Baltimore: Johns Hopkins University Press.

Hossler, D., and Stage, F.K. (1992). Family and high school experience influences on the postsecondary educational plans of ninth-grade students. *American Educational Research Journal* 29: 425–451.

Hossler, D., and Vesper, N. (1993). An exploratory study of the factors associated with parental saving for postsecondary education. *The Journal of Higher Education* 64(2): 140–165.

Hoxby, C.M. (2004). Introduction. In C.M. Hoxby (ed.), *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It* (pp. 1–12). Chicago: University of Chicago Press.

Hurtado, S., Inkelas, K.K., Briggs, C., and Rhee, B.S. (1997). Differences in college access and choice among racial/ethnic groups: Identifying continuing barriers. *Research in Higher Education* 38(1): 43–75.

Ikenberry, S., and Hartle, T. (1998). *Too Little Knowledge is a Dangerous Thing: What the Public Thinks and Knows About Paying for College*. Washington, DC: American Council on Education.

Immerwahr, J. (2003). *With Diploma in Hand: Hispanic High School Seniors Talk About Their Future*. Report No. National Center Report #03-2. San Jose, CA: National Center for Public Policy and Higher Education, and Public Agenda.

Kane, T., and Spizman, L.M. (1994). Race, financial aid awards, and college attendance: Parents and geography matter. *American Journal of Economics and Sociology* 53(1): 73–97.

Kane, T.J. (1999). *The Price of Admission: Rethinking How Americans Pay for College*. Washington, DC: Brookings Institution Press.

Kao, G., and Tienda, M. (1998). Educational aspirations of minority youth. *American Journal of Education* 106: 349–384.

Kirst, M.W., and Bracco, K.R. (2004). Bridging the great divide: How the K-12 and postsecondary split hurts students, and what can be done about it. In M.E. Kirst and A. Venezia (eds.), *From High School to College: Improving Opportunities for Success in Postsecondary Education* (pp. 1–30). San Francisco, CA: Jossey-Bass.

Lamont, M., and Lareau, A. (1988). Cultural capital: Allusions, gaps and glissandos in recent theoretical developments. *Sociological Theory* 6: 153–168.

Leslie, L.L. and Brinkman, P.T. (1988). *The Economic Value of Higher Education*. New York: American Council on Education, MacMillan Publishing Company.

Lin, N. (2001a). Building a network theory of social capital. In N. Lin, K. Cook, and R.S. Burt (eds.), *Social Capital: Theory and Research* (pp. 3–29). New York: Aldine De Gruyter.

Lin, N. (2001b). *Social Capital: A Theory of Social Structure and Action*. New York: Cambridge University Press.

Long, B.T. (2004a). How have college decisions changed over time? An application of the conditional logistic choice model. *Journal of Econometrics* 121: 271–296.

Long, B.T. (2004b). The impact of federal tax credits for higher education expenses. In C.M. Hoxby (ed.), *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It* (pp. 101–168). Chicago: University of Chicago Press.

Long, M.C. (2004c). College applications and the effect of affirmative action. *Journal of Econometrics* 121(1–2): 319–342.

Ludwig, J. (1999). Information and inner city educational attainment. *Economics of Education Review* 18(1): 17–30.

Manski, C.F. (1993). Dynamic choice in social settings. *Journal of Econometrics* 58(1–2): 121–136.

Manski, C.F., and Wise, D. (1983). *College Choice in America*. Cambridge: Harvard University Press.

Marshall, C., and Rossman, G.B. (1999). *Designing Qualitative Research* (3rd edition). Thousand Oaks, CA: Sage Publications.

McColloch, S.K. (1990). The financial planning gap. *Journal of College Admissions* 127: 12–17.

McDonough, P.M. (1997). *Choosing Colleges: How Social Class and Schools Structure Opportunity*. Albany: State University of New York Press.

McDonough, P.M., Antonio, A.L., and Trent, J.W. (1997). Black students, Black colleges: An African American college choice model. *Journal for a Just and Caring Education* 3: 9–36.

McDonough, P.M., Nuñez, A.M., Ceja, M., and Solorzano, D. (2004). *Building models of Latino/a's college choice*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

McNeal, R.B. (1999). Parental involvement as social capital: Differential effectiveness on science, achievement, truancy, and dropping out. *Social Forces* 78(1): 117–144.

Mintrop, H., Milton, T.H., Schmidtlein, F.A., and MacLellan, A.M. (2004). K-16 reform in Maryland: The first steps. In M.E. Kirst and A. Venezia (eds.), *From High School to College: Improving Opportunities for Success in Postsecondary Education* (pp. 220–251). San Francisco, CA: Jossey-Bass.

Morrow, V. (1999). Conceptualising social capital in relation to the well-being of children and young people: A critical review. *Sociological Review* 47(4): 744–765.

Mortenson, T. (2001 April). Trends in college participation by family income: 1970 to 1999. *Postsecondary Education Opportunity*. Mortenson Research Seminar on Public Policy, pp. 1–8.

National Center for Education Statistics. (2003). *Enrollment in Postsecondary Institutions, Fall 2001 and Financial Statistics, Fiscal Year 2001*. Washington, DC: Author (NCES 2004-155).

National Center for Education Statistics. (2004). *Digest of Education Statistics 2003*. Washington, DC: Author (NCES 2005-025).

National Center for Public Policy and Higher Education. (2004). *Measuring Up 2004*. Washington, DC: Author.

National Dialogue on Student Financial Aid. (2003). *Challenging Times, Clear Choices: An Action Agenda for College Access and Success*. Washington, DC: The College Board.

Nora, A. (2004). The role of habitus and cultural capital in choosing a college, transitioning from high school to higher education and persisting in college among minority and nonminority students. *Journal of Hispanic Higher Education* 3(2): 180–208.

Olson, L., and Rosenfeld, R.A. (1984). Parents and the process of gaining access to student financial aid. *The Journal of Higher Education* 55(4): 455–480.

Paulsen, M. (1990). *College Choice: Understanding Student Enrollment Behavior*. Report No. ASHE-ERIC Higher Education Report No. 6. Washington, DC: George Washington University, School of Education and Human Development.

Paulsen, M.B. (1996a). Higher education and productivity: An afterword. *Thought and Action: NEA Higher Education Journal* 12(2): 135–139.

Paulsen, M.B. (1996b). Higher education and state workforce productivity. *Thought and Action: NEA Higher Education Journal* 12(1): 55–77.

Paulsen, M.B. (2001a). The economics of human capital and investment in higher education. In M.B. Paulsen and J.C. Smart (eds.), *The Finance of Higher Education: Theory, Research, Policy, and Practice* (pp. 55–94). New York: Agathon Press.

Paulsen, M.B. (2001b). The economics of the public sector: The nature and role of public policy in the finance of higher education. In M.B. Paulsen and J.C. Smart (eds.), *The Finance of Higher Education: Theory, Research, Policy, and Practice* (pp. 95–132). New York: Agathon Press.

Paulsen, M.B., and St. John, E.P. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *The Journal of Higher Education* 73(2): 189–236.

Perna, L.W. (2005). The benefits of higher education: Sex, racial/ethnic, and socioeconomic group differences. *Review of Higher Education,* 29, 23–52.

Perna, L.W. (2004a). The key to college access: A college preparatory curriculum. In W.G. Tierney, Z.B. Corwin, and J.E. Colyar (eds.), *Preparing for College: Nine Elements of Effective Outreach* (pp. 113–134). Albany, NY: State University of New York Press.

Perna, L.W. (2004b). Understanding the decision to enroll in graduate school: Sex and racial/ethnic group differences. *The Journal of Higher Education* 75(5): 487–527.

Perna, L.W. (2004c). *Impact of Student Aid Program Design, Operations, and Marketing on the Formation of Family College-Going Plans and Resulting College-Going Behaviors of Potential Students*. Boston, MA: The Education Resources Institute, Inc. (TERI).

Perna, L.W. (2003). The private benefits of higher education: An examination of the earnings premium. *Research in Higher Education* 44 451–472.

Perna, L.W. (2000). Differences in the decision to enroll in college among African Americans, Hispanics, and Whites. *The Journal of Higher Education* 71(2): 117–141.

Perna, L.W., Steele, P., Woda, S., and Hibbert, T. (2005). State public policies and the racial/ethnic stratification of college access and choice in the state of Maryland. *Review of Higher Education* 28(2): 245–272.

Perna, L.W., and Titus, M. (2005). The relationship between parental involvement as social capital and college enrollment: An examination of racial/ethnic group differences. *The Journal of Higher Education* 76(5): 485–518.

Perna, L.W., and Titus, M. (2004). Understanding differences in the choice of college attended: The role of state public policies. *Review of Higher Education* 27(4): 501–525.

Plank, S.B., and Jordan, W.J. (2001). Effects of information, guidance, and actions on postsecondary destinations: A study of talent loss. *American Educational Research Journal* 38(4): 947–979.

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology* 24: 1–24.

Rouse, C.E. (1994). What to do after high school: The two-year versus four-year college enrollment decision. In R.G. Ehrenberg (ed.), *Choices and Consequences: Contemporary Policy Issues in Education* (pp. 59–88). New York: IRL Press.

Schneider, B., and Stevenson, D. (1999). *The Ambitious Generation: America's Teenagers, Motivated But Directionless.* New Haven, CT: Yale University Press.

Schultz, T.W. (1961). Investment in human capital. *American Economic Review* 51: 1–17.

Sewell, W.H., Hauser, R.M., and Wolf, W.C. (1986). Sex, schooling and occupational status. *American Journal of Sociology* 86: 551–583.

Stage, F.K., and Hossler, D. (1989). Differences in family influences on college attendance plans for male and female ninth graders. *Research in Higher Education* 30(3): 301–315.

Stanton-Salazar, R.D. (1997). A social capital framework for understanding the socialization of racial minority children and youth. *Harvard Educational Review* 67: 1–40.

Stanton-Salazar, R.D., and Dornbusch, S.M. (1995). Social capital and the reproduction of inequality: Information networks among Mexican-origin high school students. *Sociology of Education* 68: 116–135.

Stevenson, D.L., Schiller, K.S., and Schneider, B. (1994). Sequences of opportunities for learning. *Sociology of Education* 67: 184–198.

St. John, E.P. (2004). Public policy and research on college access: Lessons learned from NCES research and state evaluation studies. In E.P. St. John (ed.), *Public Policy and College Access: Investigating the Federal and State Roles in Equalizing Postsecondary Opportunity* (pp. 181–196). New York: AMS Press, Inc.

St. John, E.P. (2003). *Refinancing the College Dream: Access, Equal Opportunity, and Justice for Taxpayers*. Baltimore, MD: Johns Hopkins University Press.

St. John, E.P. (1991). What really influences minority attendance? Sequential analysis of the high school and beyond sophomore cohort. *Research in Higher Education* 32: 141–158.

St. John, E.P., and Asker, E.H. (2001). The role of finances in student choice: A review of theory and research. In M.B. Paulsen and J.C. Smart (eds.), *The Finance of Higher Education: Theory, Research, Policy, and Practice* (pp. 419–438). New York: Agathon Press.

St. John, E.P., Chung, C.G., Musoba, G.D., and Simmons, A.B. (2004). Financial access: The impact of state finance strategies. In E.P. St. John (ed.), *Public Policy and College Access: Investigating the Federal and State Roles in Equalizing Postsecondary Opportunity* (pp. 109–130). New York: AMS Press, Inc.

St. John, E.P., Musoba, G.D., and Chung, C.G. (2004). Academic access: The impact of state education policies. In E.P. St. John (ed.), *Public Policy and College Access: Investigating the Federal and State Roles in Equalizing Postsecondary Opportunity* (pp. 131–152). New York: AMS Press, Inc.

St. John, E.P., and Noell, J. (1989). The effects of student financial aid on access to higher education: An analysis of progress with special consideration of minority enrollments. *Research in Higher Education* 30: 563–581.

St. John, E.P., and Paulsen, M.B. (2001). The finance of higher education: Implications for theory, research, policy, and practice. In M.B. Paulsen and J.C. Smart (eds.), *The Finance of Higher Education: Theory, Research, Policy, and Practice* (pp. 545–568). New York: Agathon Press.

St. John, E.P., Paulsen, M.B., and Carter, D.F. (2005). Diversity, college costs, and postsecondary opportunity: An examination of the financial nexus between college choice and persistence. *The Journal of Higher Education* 76(5): 545–569.

Terenzini, P.T., Cabrera, A.F., and Bernal, E.M. (2001). *Swimming Against the Tide: The Poor in American Higher Education*. Report No. 2001-1. New York, NY: College Entrance Examination Board.

Thomas, S.L., and Perna, L.W. (2004). The opportunity agenda: A reexamination of postsecondary reward and opportunity. In J.C. Smart (ed.), *Higher Education:*

Handbook of Theory and Research (Vol. 19, pp. 43–84). Dordrecht, The Netherlands: Kluwer Academic Publishers.

Tomás Rivera Policy Institute at University of Southern California. (2004). *Caught in the Financial Aid Information Divide: A National Survey of Latino Perspectives on Financial Aid.* Reston, VA: The Sallie Mae Fund.

Tornatzky, L.G., Cutler, R., and Lee, J. (2002). *College Knowledge: What Latino Parents Need to Know and Why They Don't Know It*. Claremont, CA: The Tomás Rivera Policy Institute.

Turner, S.E. (2004). Going to college and finishing college: Explaining different educational outcomes. In C.M. Hoxby (ed.), *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It* (pp. 13–62). Chicago: University of Chicago Press.

U.S. Government Accounting Office. (1990). *Higher Education: Gaps in Parents' and Students' Knowledge of School Costs and Federal Aid*. GAO/PEMD-90-20BR. Washington, DC: Author.

Venezia, A., Kirst, M.W., and Antonio, A.L. (2003). *Betraying the College Dream: How Disconnected K-12 and Postsecondary Education Systems Undermine Student Aspirations.* Stanford, CA: The Bridge Project.

Weiler, W.C. (1994). Transition from consideration of a college to the decision to apply. *Research in Higher Education* 35(6): 631–646.

Western Interstate Commission for Higher Education. (2003). *Knocking at the College Door: Projections of High School Graduates by State, Income, and Race/Ethnicity, 1988 to 2018*. Boulder, CO: Author.

Winston, G.C. (1999). Subsidies, hierarchies, and peers: The awkward economics of higher education. *Journal of Economic Perspectives* 13(1): 13–36.

Zarate, M.E., and Gallimore, R.G. (2004). *Gender differences in factors leading to college enrollment: A longitudinal analysis of Latina and Latino students.* Paper presented at the annual meeting of the American Education Research Association, San Diego, CA.