16 Students' Educational Pathways: Aspirations, Decisions, and Constrained Choices Along the Education Lifecourse

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Abstract

Educational pathways are marked by a series of choices that individuals and their families make that shape students' development and educational destinations. The education attainment model is defined by a notable tension between individual choice and structural constraints that exist throughout the life course. This chapter synthesizes research on the constrained choices that typify educational pathways from early childhood to adulthood in the U.S. We focus on several areas in the literature in which the tension between individual choice and structural constraints plays out, specifically: educational aspirations, curricular differentiation, and informational barriers and opportunities. Within each of these interconnected areas we describe the dominant theories that buttress the individual determinants model, and the structural or institutional forces that shape the educational attainment process. We also review policy trends that have emerged over the past several decades designed to attenuate structural inequalities in students' educational pathways.

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Educational pathways are marked by a series of choices that individuals and their families make that shape students' development and educational destinations. Viewed from an individualistic perspective, families invest time and resources in children's educational development early in childhood. These investments are then complemented and augmented by individuals' own decisions about how and where to invest their time and energies as they progress through school. Although this individualistic view of education is represented throughout the sociology of education, it is perhaps more closely associated with cognate disciplines such as economics and psychology. Sociologists, rather, often take a more structural view of education, emphasizing the ways choices are constrained by multiple forces and institutions sorting youth among unequal pathways of educational opportunity, which results in perpetuating social inequalities. The notion of *constrained choice* suggests an important interplay between structural forces and individual decision-making, which we argue ultimately shapes students' educational pathways.

A "pathway" denotes a course individuals embark on; one in which social structures can constrain and define individual choice. Just as pedestrians typically follow pre-defined paths rather than blazing their own trails, students typically move through pre-defined positions in educational institutions. However, students—like

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pedestrians—can choose among multiple competing paths and these choices have important implications for their developmental, educational, and socioeconomic destinations. Moreover, these choices are made within different types and "levels" of social structures—some more explicit or visible than others (Hays 1994; Sewell 1992).

This chapter synthesizes research on the constrained choices that typify educational pathways from early childhood to adulthood in the U.S. We have organized the review by focusing on several areas in the literature in which the tension between individual choice and structural constraints plays out, specifically: (1) educational aspirations; (2) curricular differentiation; and (3) informational barriers and opportunities. Within each of these interconnected areas we describe the dominant theories that buttress the individual determinants model, and the structural or institutional forces that shape the educational attainment process. Finally, we review policy trends that have emerged over the past several decades designed to attenuate structural inequalities in students' educational pathways.

16.1 Educational Aspirations in a College for All Era

Educational pathways in the U.S. are now defined by a ubiquitous "college for all" ethos that dominates individual students' dialogues about their educational pathways and policy efforts aimed at reducing structural barriers to postsecondary schooling. This is most evident in discussions around a fundamental notion of choice—students' educational aspirations.

Rational choice or human capital perspectives suggest that an individual's decision to invest in education is based on an interaction of tastes, abilities, and resources. With roots in neoclassical economic theory, these perspectives rest on the central assumption that individual actors seek, above all, to maximize their economic interests. According to this line of thought, the knowledge and skills (i.e., human capital) acquired through schooling make workers more economically productive, creating a positive association between educational attainment and earnings. In light of this well-documented correlation, individuals seek to acquire as much education as they can afford as a means of securing higher earnings and status in adulthood.

Social scientists have produced multiple critiques of the rational choice explanation for the link between educational attainment and earnings, including credentialing theory (e.g., Collins 1979; Labaree 1997), screening or signaling theories (e.g., Rosenbaum and Binder 1997; Spence 1973; Stiglitz 1975), and conflict theories in the Marxian (e.g., Bowles and Gintis 1976), Weberian (e.g., Collins 1971), and Bourdieuian (e.g., Bourdieu and Passeron 1977) traditions. Each of these perspectives suggests that the structure of U.S. society and its central institutions leads individuals onto educational pathways that are determined by factors beyond straightforward cost-benefit analyses of potential educational investments. While other chapters in this volume explore the implications of these theoretical perspectives in greater depth than the present chapter, we note that, regardless of the framework one uses to understand the opportunities and constraints facing students as they navigate formal schooling transitions, a guiding principle of the U.S. schooling structure's design—both explicit through compensatory policies and implicit through the pervasive college for all ethos—is individual choice within open access pathways. Whether wholly realistic or not, this message has clearly been communicated to young people in the U.S. Students perceive that they possess substantial agency with respect to their educational futures, and their reported attainment expectations reveal that they generally intend to exercise this self-determination by obtaining degrees beyond the high school diploma.

Today's youth have registered the college refrain. A majority of middle and high school students, regardless of their academic performance, report that they will attend college (Jacob and Wilder-Linkow 2011; Goyette 2008; Reynolds and Pemberton 2001; Schneider and Stevenson 2000). The nearly universal orientation towards college represents incredible growth in

educational expectations (Jacob and Wilder-Linkow 2011; Goyette 2008; Reynolds and Pemberton 2001). Over the past several decades the percentage of 10th graders with college degree expectations has doubled, and has nearly doubled among 12th graders (Fig. 16.1). However, college degree attainment has not kept up with the increased educational expectations present among today's youth (Fig. 16.1).

16.1.1 Aspirations and Expectations as Determinants of Educational Attainment

The role of educational aspirations and expectations in the education and status attainment processes has been intensely debated in recent years. This topic captures one of sociology's longstanding debates over the role of educational aspirations as a mediator of structural determinants of adult status (Sewell et al. 1969; Sewell and Hauser 1975). As educational aspirations have become more uniform over time—a remarkable 93% of all seniors in the most recent large-scale national survey (ELS) report that they planned to continue their education after high school—some sociologists of education have raised questions about the relevance of aspirations as a meaningful predictor of students' ultimate educational attainment (Alexander and Cook 1979; Kao and Tienda 1998; Rosenbaum 2001).

In contrast to earlier periods, academic performance currently accounts for little of the variance in students' *expected* levels of educational attainment. Reynolds et al. (2006) find that between 1976 and 2000, the percentage of high school seniors indicating that they probably or definitely would complete *at least* a baccalaureate degree increased from 50% to 78%. At the same time, the explanatory power of self-reported grades and participation in a college preparatory program for predicting high school students' attainment expectations declined appreciably (Reynolds et al. 2006).

Recent work, however, suggests that educational expectations remain a key determinant of later educational success, and of students' attitudes and behavior in high school (Domina et al. 2011). In their article linking educational expectations to effort, Domina et al. (2011) test whether students' college expectations influence the importance they place on high school mathematics. They find that "educational expectations have a positive causal effect on student perceptions regarding the importance of high school academics for their future success" (p. 101), and that this relationship holds across the achievement

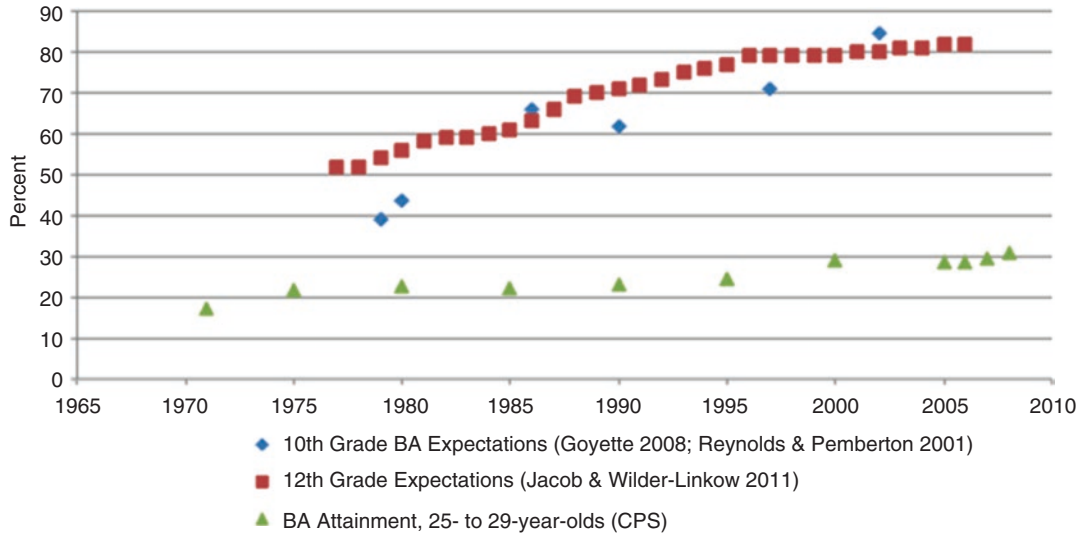

Fig. 16.1 BA expectations and attainment, 1970–2008

distribution, albeit attenuated for students at the lower end. Their findings challenge Rosenbaum's longstanding critique of the false promise of expectations in the college for all ethos, namely, that students believe that college opportunities are available irrespective of their performance in high school, and as such their expectations are a weak predictor of their effort or attainment (Rosenbaum 2001, 2011).

16.1.2 Student Beliefs as Determinants of Educational Attainment

Social psychologists have long demonstrated that students' beliefs about their abilities to succeed are related to their effort (Bandura 1982, 1997; Dweck and Elliott 1983; Schunk 1991). These ideas are related to self-affirmation theory, which suggests that people are inherently motivated to see themselves as competent and in control of their futures and will work to restore their self-worth when it is threatened (Steele 1988; Sherman and Cohen 2006; Yeager and Walton 2011). Relatedly, the belief that people can achieve what they desire through their actions is the foundation of self-efficacy theory (Bandura 1993; Gecas and Schwalbe 1983, 1986; Gecas and Seff 1989, 1990; Marcussen et al. 2004; Owens and Serpe 2003). Self-efficacy is a key component to how students may handle challenging or unpredictable situations and, importantly, how much effort they may decide to expend, or how long they persist in light of challenging or unpredictable situations. Individuals' sense of efficacy can influence actions indirectly by, for example, impacting their goals and aspirations, their effort and commitments to different pursuits, and how they cope with challenging situations (Bandura 1981; Marsh et al. 1991; Murdock et al. 2000; Reyes and Jason 1993).

Experiments from social psychology demonstrate that accentuating positive growth rather than shortfalls enhances self-efficacy, aspirations, and performance (Bandura 1993). This is critical because how students' process early difficulties can influence their educational trajectories (Cohen et al. 2009). Research on postsecondary STEM pathways illustrates the fundamental importance of self-efficacy for educational success, particularly for sub-groups historically underrepresented in these fields. For example, researchers have established that the under-participation of women in STEM majors is a function of disparities in interest in and affect towards math/science, and not to disparities in preparation or achievement (Mann and Diprete 2013; Morgan et al. 2016; Riegle-Crumb et al. 2012; Buchmann and DiPrete 2006; Xie and Shaumann 2003). Given the importance of students' perceived sense of self-efficacy in their choices and behaviors, researchers have explored how to influence and strengthen this predictor of educational attainment. Information and feedback may play an important role for strengthening students' sense of self-efficacy (a topic we turn to in Sect. 16.3 of this review).

16.1.3 Has Attainment Kept Up with Aspirations?

Educational attainment has changed dramatically over the past century in the U.S. In particular, high school completion rates have substantially improved for all groups. Specifically, from 1990 to 2014, the status dropout rate (representing the percentage of the noninstitutionalized 16- to 24-year-old population who are not enrolled in school and who have not completed a high school program) declined from 13.2% to 7.4% among Blacks and from 32.4% to 10.6% among Hispanics. Both rates, however, remain higher than the rate among non-Hispanic Whites (5.2%)[1] (National Center for Education Statistics 2016b). Although important disparities remain in high school completion, today race and income gaps are notably wider in college degree enrollment and completion (Bailey and Dynarski 2011; Black and Sufi 2002).

[1]There has been much discussion in the measurement of high school completion/dropout status (see http://nces.ed.gov/pubs2016/2016007.pdf).

The number of students attending colleges and universities in the U.S. grew to 20.2 million in 2015, an increase of nearly 33% since 2000 (Kena et al. 2015). This increase was due in part to growth in the size of the young adult population of the U.S. as well as increasing rates of postsecondary participation. Approximately 40% of 18- to 24-year-olds (i.e., the traditional college-age population) were enrolled in a postsecondary program in 2013, representing a 12.4% increase over 2000 enrollment levels. However, this increase was not constant across all subgroups. For example, while the percentage of Hispanic 18- to 24-year-olds attending college grew by 56% between 2000 and 2013, the enrollment levels of Black young adults demonstrated virtually no change (NCES 2016a). In 1990, the White–Black gap in college enrollment was 15 percentage points, and the White–Hispanic gap was 12 percentage points. In recent years, the White–Black gap has narrowed to about 7 percentage points and the White–Hispanic gap to about 8 percentage points (NCES 2016a). College enrollment gaps by income have not narrowed nearly as much as race gaps. Since the mid-1970s the high–low income gap in college enrollment has stayed relatively constant at about 30 percentage points (NCES 2016a).

Although more young people are choosing to enroll in college than ever before, the rate of degree completion has not kept up with participation, and disparities in college degree receipt remain pronounced and in some cases are actually growing. Forty-three percent of non-Hispanic Whites aged 25–29 held a bachelor's degree or higher in 2015, compared to 21.3% of Blacks and 16.4% of Hispanics (National Center for Education Statistics 2016b). Gaps by income in degree completion are also pronounced (Bailey and Dynarski 2011). In 2013, less than 10% of young adults from the lowest income quartile earned a college degree, compared to 77% of those from families in the top income quartile (an increase since 1970 of over 30 percentage points among high-income families and only by about 3 percentage points among those in the lowest income bracket (Pell Institute for the Study of Opportunity in Higher Education).

One of the most important determinants of college entrance and completion is prior academic preparation. Given the push for college participation, students' pre-collegiate experiences are a critical part of their educational pathways, and where the notion of constrained choices—individual decision-making amidst forces of structural inequalities—play out through differentiation in schooling experiences from early childhood to high school.

16.2 Curricular Differentiation Along Students' Educational Pathways

Educational pathways are in large part a function of students' schooling experiences, particularly their exposure to high-quality and rigorous curricula. Curricular differentiation, which refers to the process of sorting students into educational settings that differ according to substantive content, pace of instruction, or pedagogical approach, is a key feature of students' educational pathways, starting with preschool environments that promote school readiness, gatekeeping courses in the middle school years, and rigorous high school curricula to facilitate successful transitions to postsecondary schooling. Such curricular differentiation is fraught with tensions of individual choice and structurally constrained access to the opportunities necessary to realize those goals.

There are several plausible mechanisms by which we would expect high-quality and rigorous curricula and instruction through the educational life course to lead to increased educational attainment. First, a rigorous course of study often provides exposure to more advanced material, introducing students to topics they may encounter in subsequent years thereby improving their schooling transitions and supporting greater academic success and confidence (Lee and Ready 2009; Long et al. 2012). Second, high-quality content is often correlated with high-quality instruction. For example, more rigorous courses of study in high school (such as honors and AP) are frequently taught by more skilled teachers (often with additional credentials, more

experience, or specialized professional development), than less rigorous courses (Ingersoll 1999; Kalogrides et al. 2013). Third, rigorous schooling environments (across or within schools) attract particular students (and families), often those most socially, financially, or academically able and/or those most motivated (Lareau and Goyette 2014). As such, engagement with these higher-achieving peers (based on ability, social class, motivation, etc.) may positively influence student outcomes.[2] Fourth, enrollment in more intensely rigorous schooling environments can serve as an important, positive signal in future schooling destinations. For example, among kindergarten teachers who often differentiate students based on their pre-schooling environments; or, among college admissions officers who rank high schools on their academic intensity.

Importantly, the relationship between rigorous course of study and student educational destinations may not be causal at all, because, to a large extent, students self-select into rigorous courses in secondary and postsecondary education. Students who take a more rigorous set of courses in high school likely have a host of other attributes that also lead to their success in college and later in life (Domina et al. 2014). For example, such students may simply have better academic skills, more motivation, and a stronger work ethic, or perhaps more academic support and encouragement from their families or teachers. Several studies have also documented the qualitatively different ways parents from different income backgrounds intervene in their children's schooling experiences (Hamilton 2016; Stevens 2007; Lareau 2011, 2000). It is therefore likely that all of these attributes contribute to students' enrollment in more rigorous courses of study in the first place, making it difficult to test whether particular courses or curricular tracks directly *cause* students to succeed in college or later in life. Thus, students' educational outcomes that may appear to vary as a result of differential access to rigorous schools and/or curricula (i.e., a set of structural constraints) are in fact likely the result of much more dynamic interactions between structural barriers and individual selection (i.e. constrained choices).

Nevertheless, students do not enroll in a course of study purely based on their own preferences, nor strictly by chance. Schools serving high concentrations of low-income students often have fewer advanced curricular offerings than do schools serving a more affluent student population (Adelman 1999; Conger et al. 2009). Moreover, canonical studies that account for school differences suggest that, like racial/ethnic and socioeconomic disparities in achievement (Coleman 1966), disparities in course-taking are largely within-school phenomena rather than between-school phenomena (Gamoran 1987). This suggests that curricular disparities are mainly due to tracking or to inequalities in access to more demanding courses among students who are enrolled in the same school (Attewell and Domina 2008). The implications of such inequality suggest that researchers and educators must continue to investigate more closely the processes that contribute to course sorting, particularly when it results in within-school racial/ethnic or socioeconomic segregation (Deil-Amen and DeLuca 2010; Kelly 2009; Riegle-Crumb and Grodsky 2010).

16.2.1 Academic Curriculum in the Pre-schooling Years

For most children in the United States, the pathway through formal schooling begins with participation in center-based pre-kindergarten programming. Most pre-kindergarten programs have the overarching goal of increasing students' "school readiness," the set of intellectual, social, and emotional competencies that foster success in kindergarten and beyond (Duncan et al. 2007). A recent meta-analysis of pre-kindergarten program evaluation studies concluded that, on average, pre-kindergarten participants gained the equivalent of an additional four months of learning compared to children who did not attend preschool, providing them with a stronger foundation as they entered kindergarten (Camilli et al. 2010).

[2]See Sacerdote (2001) and Zimmerman (2003) for evidence of peer effects in education.

Moreover, longitudinal studies of pre-kindergarten education's effects demonstrate that short-term improvements in language and mathematics ability are accompanied by positive outcomes in the longer-term as well, including increased educational attainment, higher earnings, and less criminal behavior in early adulthood (Campbell et al. 2002; Heckman et al. 2010).[3]

Researchers studying the effects of pre-kindergarten education on children's academic and socio-emotional development have identified largely positive effects of participation in academically oriented programming (e.g., Gormley et al. 2005). Moreover, these effects demonstrate a compensatory effect: Children from low-SES backgrounds experience greater increases in early achievement and development than do children from middle- or upper-class families. However, because access to academically oriented pre-kindergarten programs is stratified along social class lines, fewer low-income children participate in such programs than do higher-income students. Thus, as the first form of formal education encountered by many U.S. children, structural inequalities in pre-kindergarten programming establish unequal academic pathways that extend into the elementary school years.

Early childhood remains a primary area of compensatory social investments aimed at attenuating inequality prior to formal schooling. Researchers, educators, and policymakers have at turns considered the potential for pre-kindergarten education to improve the education and life course outcomes of children from socioeconomically disadvantaged and ethnic minority backgrounds (e.g., Currie 2001; Duncan et al. 2007; Heckman et al. 2010). Beginning in the 1960s, findings from a series of now famous experiments began to emerge that demonstrated pre-kindergarten education's ameliorative potential for low-income children (Schweinhart et al. 2005; Campbell and Ramey 2010).[4]

Despite the aforementioned success stories of efforts to improve disadvantaged students' educational outcomes through pre-kindergarten programming, the federal government's preschool programs for children in poverty—Head Start and Early Head Start—have generated a mixed pattern of results. The Head Start Impact Study (Puma et al. 2010) used a randomized control design to estimate the effects of 3- and 4-year-olds' Head Start participation on their cognitive and social-emotional outcomes at the end of first grade. While the study's results indicated that Head Start participants enjoyed benefits during program participation, these advantages "faded out" over a relatively short period of time. Recent findings from a randomized control trial in Head Start programs suggest that this fade-out is attributable to elementary school quality, as program participants who subsequently enrolled in high-performing elementary schools demonstrated continued benefits, while those who attended lower-performing schools experienced fade-out (Zhai et al. 2012). This finding echoed earlier work by Currie and Thomas (2000), who demonstrated that elementary school quality differences explained differential Head Start fade-out effects among White and Black students. Thus,

[3]While these outcomes carry clear benefits for individual students, researchers have also performed cost-benefit analyses at aggregate levels, finding that preschool programs provide benefits to society as a whole through cost savings (e.g., reduced spending on expensive special education or juvenile justice programs) and participants' increased economic productivity in adulthood. Estimates of these societal benefits tend to outweigh preschool operating costs by considerable margins, often on the order of $5 or more of economic return for every $1 spent on pre-kindergarten programs (Duncan et al. 2007; Heckman et al. 2010; Reynolds et al. 2011; Yoshikawa et al. 2013).

[4]The Perry project enrolled 58 low-income, Black 3-year-olds in 2.5-h classes that met 5 days per week for the 2 years preceding kindergarten. Members of the treatment group demonstrated multiple advantages relative to the control group in the near-term (e.g., higher IQ scores, increased standardized test performance, better teacher-rated classroom behavior) and in the long-term (e.g., higher high school graduation rates, less involvement in the criminal justice system as adolescents and adults, higher earnings in adulthood) (Schweinhart et al. 2005). Similarly, Abecedarian Project participants, who received pre-kindergarten educational intervention from approximately four months of age until kindergarten entry, experienced improved achievement, attainment, and health outcomes compared to control group members from childhood through adulthood (Campbell and Ramey 2010).

early investments in children's schooling for improving educational and occupational attainment are largely only realized through sustained quality experiences in schooling.

16.2.2 Academic Curriculum in the Elementary Schooling Years

School districts in 46 states are required to offer publicly funded schooling beginning with kindergarten, in which children are typically eligible to enroll at age 5.[5,6] Students proceed through the elementary years along pathways that are differentiated by curricular content, pace of instruction, and pedagogical approach.

Ability grouping in elementary school classrooms has been a frequent subject of sociological research since the 1980s. The term ability grouping refers to the practice of organizing a classroom of students into small groups for the purpose of delivering to each group a modified curriculum, most often in language arts or mathematics. Classroom teachers make group assignments based on their assessment of students' current knowledge and cognitive ability, with the goal of allowing the teacher to present students with a curriculum that is neither too challenging (which might place students at risk for frustration and discouragement) or too easy (which might lead to developmental stagnation or disruptive behavior).

As a potential solution to the pedagogical challenge of teaching groups of young students with widely varying levels of preparedness and performance, ability grouping offers a compelling logic. Indeed, on the face of things it might even seem irrational to argue that administering a one-size-fits-all curriculum could ever be preferable to presenting students with tailored instruction matched to their specific learning styles and needs. However, research findings from the sociology of education complicate this picture, calling into question ability grouping's educational efficacy, and bringing to light the structural forces that determine students' groupings, which often result in inequities along racial/ethnic and socioeconomic lines (Gamoran et al. 1995; Hallinan 1994; Oakes 2005; Slavin 1987).

The academic pathways constructed through within-class ability grouping are often less visible than those created by, for example, curriculum track placement in high school. Unlike those formal curricular placements, which require parents' and/or students' consent, elementary school ability group decisions generally fall under the classroom teacher's sole purview. Moreover, students' ability group placements are generally not noted in their school records or transcripts. Despite their comparative informality, however, ability group placements have the potential to establish durable academic pathways for young students, and these pathways feed directly into the formally differentiated curricular pathways of middle and high school. The social-psychological consequences of such groupings on students' subsequent choices about curricular tracks (when such choices are at the individual or parental level), however, are not well understood.

[5] 34 States require districts to offer half-day kindergarten programs and 12 states require full-day kindergarten. Kindergarten attendance is compulsory in 16 of these states. The age at which children must legally begin attending school varies across states, ranging from five to eight years old. (Source: https://nces.ed.gov/programs/statereform/tab5_3.asp)

[6] "Academic redshirting," the practice of voluntarily delaying children's kindergarten enrollment by one year, has received abundant scholarly and popular attention in recent years. While research evidence suggests that the practice is most common among boys, non-Latino Whites, children from high-SES families, and those whose birthdays fall close to kindergarten enrollment cutoff dates (Bassok and Reardon 2013), estimates of academic redshirting's prevalence indicate that it is not as widespread as commonly believed, with between 3.5% and 5.6% of U.S. kindergarteners demonstrating delayed enrollment (Bassok and Reardon 2013; Huang 2015; Snyder and Dillow 2013). Increased age at kindergarten enrollment is associated with a host of short-term positive outcomes, including higher achievement (Datar 2006; Datar and Gottfried 2015), improved social-behavioral skills (Datar and Gottfried 2015), and dramatically reduced odds of being diagnosed with attention deficit/hyperactivity disorder (Dee and Sievertsen 2015), yet evidence for positive long-term effects is scant (Cascio and Schanzenbach 2016; Deming and Dynarski 2008; Lincove and Painter 2006).

Building on the concept of opportunity-to-learn (OTL), sociologists of education have made the straightforward argument that students are more likely to learn material that is presented to them in class than material they never encounter (e.g., Porter 1989; Sørensen and Hallinan 1986). Extending this line of work to research on ability grouping, several researchers have found that the amount of curricular material presented to students in differentiated ability groups exhibits considerable variation across learning groups in the same classroom, with students in high-ability groups being exposed to a greater proportion of the intended curriculum than those in middle- or low-ability groups (Eder 1981; Gamoran 1986; Oakes 1985; Pallas et al. 1994). Thus, ability grouping potentially provides unequal OTL according to teachers' perception of students' ability, leading to further widening of initial achievement gaps over time, a pattern some sociologists refer to as "cumulative advantage" (e.g., DiPrete and Eirich 2006) or "the Matthew effect" (e.g., Kerckhoff and Glennie 1999). To the extent that initially high achieving students cover more curricular ground than initially lower achieving students over the course of each school year, this process tends to be self-reinforcing across the elementary school grades (i.e., the students who finish a given school year having learned the most material are the "high achievers" when the following school year begins, and are therefore placed in high-ability, high-OTL groups once again). This curricular path dependence manifests in the form of unequal educational pathways concealed within what, on the surface, appears to be a singular educational "mainstream."

Research findings suggest that more flexible (i.e., frequently adjusted) and appropriate (i.e., accurate with respect to students' learning abilities) group placements lead to greater equality of academic outcomes experienced by students of varying abilities (Sørensen 1970; Gamoran 1992; Gamoran et al. 1995). In practice, however, ability grouping systems are highly imperfect along these lines. Inappropriate and fairly static group assignments tend to result in students being assigned to differentiated curricular pathways in ways that exacerbate pre-existing achievement inequalities along racial/ethnic, and socioeconomic lines (Gamoran et al. 1995; Hallinan 1994; Oakes 2005; Slavin 1987).

16.2.3 Academic Curriculum in the Middle School Years: The Push for Universal Algebra

Following the publication of *A Nation at Risk* (National Commission on Excellence in Education 1983), American public education took a decided turn toward emphasizing academic achievement, particularly in science and mathematics. This sea change included an expansion of rigorous curricula during the middle school years as a means of ensuring the United States' future economic competitiveness and national security (Schoenfeld 2004). The push for more and earlier student access to advanced mathematics was promoted as a solution to *A Nation at Risk*'s prophesized "rising tide of mediocrity." In response, a contingent of educators and civil rights leaders began to put forth an equity-based argument for curricular reforms, specifically in mathematics, targeting underserved students and schools. Robert Moses, a math educator and an influential activist in the civil rights era of the 1960s, is most closely associated with this movement. Having founded the Algebra Project in 1982 to improve mathematics education among low-income students and students of color, Moses argued that access to advanced mathematics is a requisite for full economic participation and citizenship in an increasingly technological society, and one that is systematically denied to members of marginalized populations (Moses and Cobb 2002). These distinct yet mutually reinforcing arguments—excellence and equity—ushered in an era of intense preoccupation with boosting algebra enrollments nationwide (Gamoran and Hannigan 2000).

The "algebra for everyone" perspective shaped education reform in multiple ways, most notably in the form of heightened course-taking expectations that became part of the emerging standards

and accountability reform movement. Reports from the National Research Council (*Everybody Counts* [NRC, 1989]) and National Council of Teachers of Mathematics (*Curriculum and Evaluation Standards* [NCTM, 1989]) codified these new, intensified expectations, leading several states and large school districts to respond accordingly.

These efforts reached a zenith in California, where, in 1997, the state department of education revised its education standards to reflect an expectation that all students be enrolled in algebra, a recommendation that became law with the passage of the *Public School Accountability Act* (PSAA) in 1999 (Domina et al. 2014). Response to this legislative reform was swift: Over half of California eighth graders were enrolled in algebra courses by 2008, up from only 16% at the time of the PSAA's passage. For policymakers concerned with Americans' declining technical expertise, as well as education activists dedicated to equalizing students' pathways to college, this "algebra for everyone" reform represented an encouraging step forward (similarly ambitious reforms in other states and large school districts, such as Chicago Public Schools were also underway (Allensworth et al. 2009; Nomi 2012; Nomi and Allensworth 2013)).

While California made strides toward achieving the near-term goal of increasing access to algebra among middle school students, recent assessments of the algebra for everyone movement's longer-run impacts have been somewhat disappointing. Despite the widely held understanding that algebra operates as a "gatekeeper" for participation in future advanced mathematics coursework (Oakes 1990; Riley 1997; Smith 1996), recent evaluations have revealed that mandatory eighth grade algebra reforms do not lead to increased advanced math course-taking (Liang et al. 2012), nor have mandatory algebra reforms led to increased average mathematics achievement in the high school years (Clotfelter et al. 2015; Domina et al. 2014, 2015; Loveless 2008). Similarly, evaluations of Chicago Public Schools' mandatory ninth grade algebra reforms found that the program was associated with increased failure in subsequent mathematics coursework, as well as performance declines among initially high-skill students (Nomi 2012; Nomi and Allensworth 2013). Additional research will be necessary to understand the causes of these disappointing outcomes; initial results from quantitative work point toward "peer effects" and the complex set of social relations that result from heterogeneous grouping strategies like universal algebra as key challenges (Hong and Nomi 2012; Domina et al. 2015). Other work, perhaps qualitative in nature, is necessary for understanding why such reforms may not meet desired outcomes.

16.2.4 Academic Curriculum and Rigor in High School

Not surprisingly, students with a more rigorous course of study in high school are more likely to apply and enroll in more selective campuses, and are less likely to require remediation when they enter college (Kurlaender and Howell 2012; Long et al. 2012; Adelman 1999, 2006). Enrolling in a rigorous course of study in high school is not only associated with higher educational attainment, but also with improved labor market outcomes. Several studies find that enrolling in more advanced mathematics courses in high school leads to higher wages once in the workforce (Altonji 1995; Levine and Zimmerman 1995; Rose and Betts 2004).

Researchers have attempted to deal with the complexity of estimating the influence of curricular intensity on future success by using a variety of approaches. When researchers control for as many observable characteristics as are available, they find a consistent positive association between curricular intensity and the following: student test scores (Attewell and Domina 2008), high school graduation (Schneider et al. 1997), college entry (Long et al. 2012), type of college entry (Attewell and Domina 2008), college grades (Klopfenstein and Thomas 2009), college graduation, (Adelman 2006; Attewell and Domina 2008), and wages (Altonji 1995; Rose and Betts 2004).

Using detailed information from students' high school transcripts, Long et al. (2012) find

a 7–11 percentage point increase in the likelihood of high school graduation and 4-year college entry between a student who takes no rigorous high school courses and a student taking just one rigorous course during high school. This study finds that the biggest differences in student outcomes are based on math and English course levels, though enrollment in rigorous courses in other subjects also leads to improved outcomes. Long and colleagues also find that, although more rigorous courses are associated with better student outcomes, the differences were greatest between those taking no rigorous course and those taking only one. This result suggests "requiring or encouraging students to enroll in even one rigorous course in their first two years of high school can substantially improve graduation and four-year college enrollment rates" (Long et al. 2012, p. 315).

Improving academic standards in secondary schools has been at the heart of the Common Core State Standards reform efforts, which has emphasized the need to better align K–12 education systems with higher education to ensure a more seamless transition for young adults between high school and college, and between high school and the labor market. The push for more academic rigor is evident in the course-taking trajectories of high school students. Over the last three decades the percentage of students enrolled in precalculus or calculus in U.S. high schools has steadily grown. In 1982, only slightly more than 10% of students graduated high school with precalculus or calculus coursework, by 1992 that figure more than doubled to 21.7%, and in 2004, 33% of high school students were enrolled in at least precalculus coursework.

Efforts to increase the academic intensity of students' high school curricula have also been spurred by an equity agenda that seeks to ensure access to rigorous courses for students from all demographic backgrounds. Data from a nationally representative sample of high school students' course enrollment reveal that White and Asian students are much more likely to be enrolled in a more rigorous set of courses than are Black or Latino youth (Planty et al. 2006).[7] Data on mathematics course-taking over time reveal that, although increasing numbers of students have been completing precalculus or calculus in high school in recent decades, the rates for Black and Hispanic/Latino students clearly lag behind the rates of White and Asian high school students, and these gaps have actually grown over time (see Table 16.1).

Similarly, students from higher-income families have higher levels of participation in more rigorous academic coursework than do their lower-SES peers. This is consistent with research indicating that lower-SES students, in particular,

Table 16.1 Percentage of high school graduates who completed precalculus or calculus, by race and socioeconomic status: 1982, 1992, and 2004

	1982	1992	2004
Overall	10.7	21.7	33.0
Race/ethnicity			
White	12.2	23.0	36.7
Black	4.0	13.6	19.0
Hispanic/Latino	5.3	12.7	21.9
Asian/PI	30.1	41.6	56.8
Am Indian	2.3	3.1	12.9
Socioeconomic status			
1st quartile (lowest)	2.7	8.0	17.7
2nd quartile	6.7	13.2	22.7
3rd quartile	11.3	21.9	34.0
4th quartile (highest)	2.05	38.5	52.4

Source: U.S. Department of Education, National Center for Education Statistics, High School and Beyond Longitudinal Study of 1980 Sophomores (HS&B-So:80/82), "High School Transcript Study"; National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, Transcript Survey, 1992"; and Education Longitudinal Study of 2002 (ELS:2002), "First Follow-up, High School Transcript Study, 2004." Available at: http://nces.ed.gov/pubs2007/2007312.pdf

[7]Source: U.S. Department of Education, National Center for Education Statistics, Education Longitudinal Study of 2002 (ELS:2002), "High School Transcript Study." Adapted from: Planty, M., Bozick, R., and Ingels, S.J. (2006). *Academic Pathways, Preparation, and Performance — A Descriptive Overview of the Transcripts from the High School Graduating Class of 2003–04* (NCES 2007–316). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

continue to be underrepresented at more selective postsecondary institutions because they have not completed the appropriate coursework (Carnevale and Rose 2003). Importantly, Rose and Betts (2004) find that the type of math courses students take in high school explain 27% of the earnings gap between students from the lowest-income families and those from middle-income families. Similarly, using data on students in Florida public postsecondary institutions, Long and colleagues (2009) find that 28–35% of the gaps (and over three-quarters of the Asian advantage) in college readiness among college-going Black, Hispanic, and low-income students can be explained by the highest math course taken in high school.

There are a host of factors that contribute to students' sorting into various levels of courses in high school: availability of courses, knowledge of offerings at the school, academic ability, interest, motivation, familial involvement, and the influences of teachers, counselors, and/or peers. As such, properly addressing racial/ethnic and socioeconomic differences in analysis of course enrollment patterns requires further inquiry into each of these (and other) possible sources of existing disparities in curricular pathways.

16.2.5 Structural Differences in Academic Preparation for College

Studies that parse out the effects of academic rigor by race/ethnicity and SES find that the return to taking more advanced coursework could vary with the attributes of the school. For example, Long et al. (2012) find that students attending high-poverty schools or those with lower average levels of student achievement experienced larger increases in their high school graduation and college enrollment rates associated with taking more rigorous courses than students attending more affluent high schools. Efforts to ensure opportunities are more equally distributed between schools have focused on addressing disparities in curricular offerings, particularly in college gateway courses such as Advanced Placement (College Board).

In principle, any academically stimulating environment may contribute to academic rigor. In practice, however, evaluating the learning environment for rigor can be difficult. It is common to use measures such as course titles and/or grades as proxies for rigor. But even these do not mean the same thing everywhere. For example, Fig. 16.2 displays a scatterplot of the probability of being college ready (Y-axis) against high school grade point average (X-axis) among students attending one of the 23 campuses of the California State University (CSU) system (the State's primary public BA-granting higher education system and the nation's largest public 4-year postsecondary system). Beyond the obvious positive association between high school GPA and college readiness is the stark difference between School A and School B. In School A, a California public school that serves less than 10% of students on free/reduced price lunch, even a student with a 2.5 GPA enters the CSU system "college ready" (as measured by placement tests); in contrast, in School B, which has an over 90% free/reduced price meal eligibility rate among its students (a great majority of them Latino), even the 4.0 student only has about a 40% likelihood of being "college ready" (i.e., not needing any remediation when she enters college).

In sum, students are not randomly placed into their educational pathways, but rather their curricular pathways are shaped by both the opportunities that they are exposed to (a structural argument) and their choices (an individual agency argument). The result is that it is not only difficult to separate out unobserved motivation, support, or other characteristics that may be associated with both rigorous course-taking and better educational outcomes, but also the many structural dimensions that constrain individual choice. These competing forces often result in educational pathways that self-perpetuate. That is, quality early schooling experiences beget better placement into secondary schooling decisions, and then more intense academic rigor in high school that results in more selective college admissions, and greater likelihood of degree attainment and labor market success. Thus, stu-

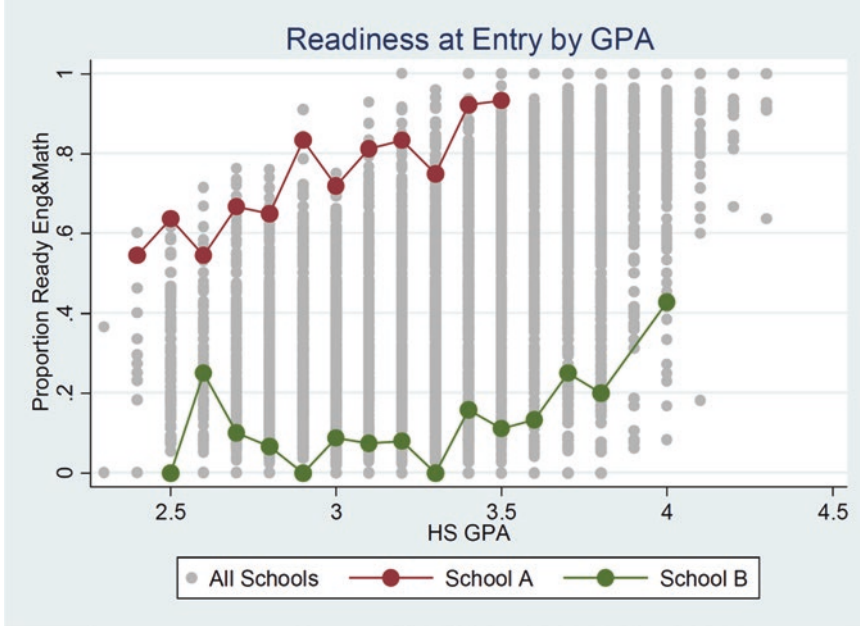

Fig. 16.2 The association between college readiness and high school GPA in California Public Schools

dents do have many choices and self-select (often with the aid of parents, teachers, or counselors) into a course of study; however, they do so within a set of structural constraints or opportunities. A primary way in which educators and policymakers hope to break the self-perpetuating nature of educational pathways and improve mobility between educational destinations is through increased access to information about alternative pathways and opportunities.

16.3 The Role of Information in Navigating Educational Pathways: Barriers and Opportunities

Despite a college for all culture, students often have very limited and only vague information about what college will be like, which is particularly true for students who are the first in their family to attend college (Settersten and Ray 2010). The research on inequality in educational attainment, particularly examinations of pathways to college and college choice, is heavily framed by theories of social and cultural capital, and the extent to which programs aimed at improving college information can attenuate inequality in postsecondary pathways.

As a set of resources embedded in social relationships that facilitate certain actions (including applying to or enrolling in a particular college), social capital plays a major role in shaping students' educational pathways. It is through their social connections that students learn a normative orientation toward higher education (i.e., the educational expectations to which they will be held by others in their social networks, including their parents, teachers, and peers) and also acquire valuable information from others about the college application and participation processes.

Research on social capital's role in college application and attendance has demonstrated the importance of students' social ties to peers (Perez and McDonough 2008; Perna 2000; Tierney and Venegas 2006), institutional agents such as teachers and counselors (Perna and Titus 2005; Stanton-Salazar 1997, 2001), immediate and extended family members (McDonough 1997; Perna and Titus 2005), college outreach programs (Gonzalez et al. 2003), and the overall school community (Sandefur et al. 2006) for develop-

ment of college-going attitudes and behaviors. Students who internalize socially constructed norms of college attendance through their social interactions and those whose networks provide access to information about the multifarious details associated with the college choice process enjoy increased probabilities of college attendance and persistence relative to students with fewer social capital resources.

Like social capital, cultural capital's role in the college-going process has also received substantial attention from sociologists. In this context, cultural capital refers to the status-linked sets of skills, knowledge, and preferences that are rewarded by higher education institutions and are transmitted from parents to their children (Lareau and Weininger 2003). In her work on the college choice process, McDonough (1997) describes how middle-class parents' access to first-hand information about college admissions procedures and strategies for maximizing their children's odds of admission (e.g., through the use of private SAT tutors) represent a form of cultural capital—valuable information that is readily available only to children of high-status parents and is not transmitted through schooling. Compared to students who lack dominant cultural capital (particularly in in the form of college admissions information), those who possess institutionally valued cultural capital are more likely to hold high educational aspirations, enroll in college, and reap positive returns to their postsecondary education investments (Aschaffenburg and Maas 1997; Bourdieu and Passeron 1977; DiMaggio and Mohr 1985; Dumais and Ward 2010; Lamont and Lareau 1988; Schneider and Stevenson, 1999). For high-achieving, low-SES youth, this lack of cultural capital also leads them to disproportionately apply to nonselective schools that offer a poor match to their academic skills and to be unsuccessful in navigating the financial aid process (Goldrick-Rab 2006; Hoxby and Avery 2013).

A recent example of sociological research on information qua cultural capital can be found in the work of Holland and DeLuca (2016). Analyzing data from interviews with 150 low-income youth, the authors describe these students as suffering from "information poverty" with respect to the postsecondary school transition and the pathway from college to work. These youths' sense of urgency toward obtaining a solid job led them toward the ill-advised decision to enroll in for-profit trade programs rather than 2- or 4-year nonprofit institutions. As a consequence of their low levels of cultural capital, the students in Holland and DeLuca's study ended up with fewer job prospects and more financial debt than they might have if their postsecondary choices had been better informed.

Like Holland and DeLuca, Harding (2010) uses interviews with low-SES, ethnoracial minority youth to examine the role cultural capital plays in shaping their educational pathways. While the youth in Harding's study overwhelmingly aspired to a college degree, the most effective strategies for reaching this goal were obscured by their lack of cultural capital. Unlike the higher-SES youth who are surrounded by individuals who espouse a "mainstream" model of desirable educational pathways, low-SES youth exist in a context of "cultural heterogeneity," which produces multiple alternative logics of educational success, including alternative credentials (e.g., the GED), attending trade schools, or choosing job training programs over traditional college. Whereas higher-SES youth are presented with a unified cultural front regarding the desirability of a 4-year degree (and the corresponding undesirability of other pathways), lower-SES youths' cultural repertoires include support for multiple educational and occupational pathways, which weakens the relationship between their (almost universally high) postsecondary aspirations and their ultimate educational attainment (Harding 2010, 2011). Along similar lines, Lee and Zhou (2015) attribute children of Asian immigrants' "paradoxically" high levels of educational attainment to a set of culturally grounded "success frames" through which community members establish a narrow definition of academic success as attaining an advanced degree from an elite college or university.

Sociologists often view social and cultural capital resources as intertwined and mutually dependent, with access to one set of resources

potentially mitigating low levels of the other. For example, Grodsky and Riegle-Crumb (2010) find that social capital may be especially important to the college choice process for students who do not possess a "college-going habitus." A concept originating in cultural capital theory (Bourdieu and Passeron 1977), habitus refers to the attitudes and dispositions an individual unconsciously develops through repeated interactions with the social world. Grodsky and Riegle-Crumb (2010) identify an individual's taken-for-granted belief that they will attend college as the hallmark of a college-going habitus that is disproportionately possessed by young members of the elite, for whom the postsecondary transition occurs almost as a natural matter of course. Unlike these privileged students, those who do not possess a college-going habitus must develop the knowledge, skills, and attitudes consistent with college attendance via the social capital resources they manage to access over the course of their educational careers (Grodsky and Riegle-Crumb 2010).

Because social and cultural capital, like other valuable resources, are differentially distributed along typical axes of social stratification, inequalities in social and cultural capital tend to magnify existing gaps in college attendance and persistence. Programs designed to facilitate the transfer of college information to all students aim to intervene by interrupting the link between social status and social capital. Programs such as AVID, Upward Bound and Summer Bridge have long focused on providing students (particularly first-generation college students from underrepresented backgrounds) with exposure to not just the academic, human capital skills, but also the social and behavior skills (i.e., cultural capital) required for college success. The evidence about the effectiveness of these programs, however, is mixed and limited (Domina 2009; Barnett et al. 2012).

The most compelling evidence that educational pathways are not seamless for many students is found in the high rates of college remediation present across broad access colleges and universities throughout the U.S. (where the majority of students go to college). Beyond the great financial expense of college remediation (to the individual and to the public), we also know that students who enter college in need of remediation are less likely to persist and less likely to complete a college degree than those who do not require remedial coursework (Bettinger et al. 2013). Part of the explanation for the large share of students requiring remediation once they arrive in college may be a result of the limited information students possess regarding what they need to do to succeed in college.

An important effort to improve alignment between K–12 and postsecondary systems is to provide high school students with early information about college expectations. High school students use information from many sources to make numerous decisions, such as whether and how to complete high school, and whether and where to attend college. Early information may help students realize that they need additional academic preparation, and motivate students to do well with their remaining time in high school. Moreover, there is evidence that high school students update their college-going trajectories based on information that they receive during secondary school (Jacob and Wilder-Linkow 2011). In fact, students respond to labels assigned to them by standardized tests. Papay et al. (2011) show that the labels assigned to students through state standardized testing impact college-going decisions. A "Needs Improvement" label causes urban, low-income students to be more likely to enroll in college than a "Warning" label. Moreover, Papay et al. (2011) show that urban, low-income students were shown to update their educational attainment expectations based on standardized test result labels as early as eighth grade.

Early information from college assessments, which are intended to motivate students toward their postsecondary goals, could hypothetically be discouraging to lower-performing students. Students taking state assessments who are told that they may require remediation upon entering a particular college may feel that they do not fit well with that college, and decide to enroll elsewhere or not at all. However, research on California's effort to provide students with college readiness information in 11th grade found

that the early signal of "not ready" did not dissuade students from applying or enrolling in college, or push them into attending a less academically demanding college, and actually improved overall remediation rates at California's broad access 4-year institutions (Howell et al. 2010; Jackson 2015; Kurlaender et al. 2016).

The literature in education policy is also rich in studies focused on the role of information in college affordability. Despite being eligible, many students do not apply for financial aid for college (King 2004; College Board 2017; Yonezawa 2013). Information plays an important role in financial aid take-up because incomplete or insufficient information can lead students to underestimate benefits or overestimate costs of college, and can preclude students from applying for financial aid (Perna 2007; Scott-Clayton 2012). Household income and parent education are positively correlated with knowledge of college prices; minority and low-income parents are less likely to provide an accurate estimate of college costs when compared to more affluent or White parents (Grodsky and Jones 2007; Horn et al. 2003).

Financing college remains an important structural constraint for many individuals. The primary reason given by a representative sample of youth that did not go to college is because they could not afford to attend (Bozick and DeLuca 2011). Need-based financial aid is designed to provide additional help for low-income students, but complex aid formulas, poor marketing, and complex application procedures can create additional information barriers (Scott-Clayton 2012). Current financial aid barriers include lack of awareness about aid and the complexity of the Free Application for Federal Student Aid (FAFSA) required for all federal and most state need-based aid programs (Long 2010). At five pages and 127 questions, the FAFSA is longer and more complicated than federal tax return forms (Dynarski and Scott-Clayton 2006). This complexity also has significant costs, including the time and resources it takes for individuals to read directions and requirements, collect all needed documents, and actually fill out the application (Dynarski and Scott-Clayton 2006). Low-income families are also likely to face higher compliance costs because they most likely lack college-going peers and relatives to assist them (Dynarski and Scott-Clayton 2006). If these barriers are larger for disadvantaged students, the primary purpose of federal need-based financial aid may be jeopardized (Scott-Clayton 2012). For students who do attempt the FAFSA, many have difficulty in answering questions, requesting a high school diploma, or having a Social Security number (Yonezawa 2013; McKinney and Roberts 2012).

These information barriers could be especially pronounced for non-traditional age students and students from low-income backgrounds attending broad access institutions, such as community colleges (Bean and Metzner 1985; Taniguchi and Kaufman 2005). Compared to students at 4-year institutions, community college students are more likely to be first-generation college students, to enroll part-time, have discontinuities in terms enrolled, and switch between part-time and full-time enrollment (Crosta 2013; Provasnik and Planty 2008; Bailey et al. 2005; Deil-Amen and Rosenbaum 2003; Dougherty 1994; Brint and Karabel 1989). The current financial aid system is largely designed to assist traditional undergraduates enrolling right after high school (Long 2010). Community college students can also be penalized if financial aid requires full-time attendance, a traditional high school diploma, or a specific goal for a credential or degree (Long 2010; Terriquez and Gurantz 2014). Because need-based financial aid targets students at the margin of choosing whether or not to attend college, the FAFSA's complexity may lead to negative decisions about college enrollment and/or persistence (Scott-Clayton 2012). In effect, the students least likely to be able to afford college are the ones with the least amount of information about college cost (Horn et al. 2003).

In light of these information barriers, some researchers have tested information-based interventions in college financing. Most notably, Bettinger et al. (2012) implemented a randomized field experiment conducted with the tax preparation firm H&R Block to assist families with FAFSA preparation. For dependent stu-

dents, personal counseling increased FAFSA submission by 16 percentage points (40% increase), Pell Grant receipt by 10 percentage points (36% increase) and college enrollment by 8 percentage points (24% increase) (Bettinger and Long 2009). For independent students with no prior college experience, the intervention increased FAFSA submission by 27 percentage points (168% increase), Pell Grant receipt by 3 percentage points (27% increase) and college enrollment by 1.5 percentage points (16%). There were also longer-term effects. Three years after the intervention, students were more likely to be enrolled for at least two consecutive years.

Even after being admitted and accepting a college offer, 10–22% of students fail to enroll in the following fall semester (Castleman and Page 2014a). This phenomenon—also known as "summer melt"—is particularly high among the lowest-income students (Castleman and Page 2014a, b). This is possibly attributed to the informational barriers imposed during the summer months when students receive a large volume of material from their intended college of enrollment, which can be especially overwhelming for first-generation students and families with lower financial literacy (Arnold et al. 2009). To address such information barriers, low-cost interventions sent via phone, email, social media, and text messages to students periodically throughout the summer, offering counseling and reminding them of enrollment and financial aid deadlines have been tested. These resulted in increases in college enrollment, persistence through freshman year, and persistence into sophomore year (Castleman and Page 2015). Effects were even larger for the lowest-income students, for whom college enrollment increased by 12 percentage points (Castleman and Page 2015).

Finally, information interventions have been used to address "undermatching" in college enrollment. Hoxby and Avery (2013) find that a large majority of high-performing low-income students do not apply to selective colleges despite the fact that their academic performance on the SAT or ACT would make them eligible for admission. In fact, 40% of low-income high-achieving students only send their scores to non-selective schools, while only 8% send them to selective schools for which they are qualified (Hoxby and Avery 2013). These gaps are mainly driven by students' decisions on where to apply to college, instead of college admission decisions (Dillon and Smith 2017; Hoxby and Avery 2013). This is problematic because the persistence and graduation rates at non-selective schools are often lower than more-selective institutions, and also because there are important rewards in the labor market to attending a selective institution (Hoekstra 2009). Undermatching has important consequences; these high-achieving low-income students would actually pay a lower net price at more selective institutions compared to less-selective institutions as a result of selective institutions' more generous financial aid, and would also often qualify for fee waivers to send their SAT/ACT scores to more institutions.

Hoxby and Turner (2015) implemented a low-cost intervention aimed at providing these students with more information and fee waiver applications. Students receiving the intervention submitted more applications, and were 15–19% more likely to apply to multiple peer institutions. As a result, the "maximum" schools students applied to had higher median SAT scores, higher graduation rates, and reported higher spending on students (Hoxby and Turner 2015).

Information is an important determinant of students' educational pathways, and one that is not evenly distributed (by school, by race, or by social class). Today, clear structural barriers to information about successful college navigation pathways and tools endure. However, these information barriers are also the target of some of the most developed and popular areas of interventions among social scientists and policymakers eager to reduce educational attainment gaps between groups from different racial/ethnic or social strata.

16.4 Conclusion

Throughout the twentieth century, the U.S. education system witnessed major expansion, with increasing enrollment of individuals from all

backgrounds at all levels of educational attainment (Goldin and Katz 2009). The now ubiquitous college for all ethos permeates much of our discussion of educational pathways. This is perhaps most notable when you ask young people about their educational plans. Today's high school students are nearly universal in their reported choice to attend college.

The sociology of education remains focused on understanding how such expansion in educational attainment has been realized both structurally and among individuals. Although individuals from all backgrounds have experienced increases in educational attainment in the U.S., disparities by race and social background persist. Structural factors create inequalities in students' opportunities to learn in the preschool years, and continue sorting children among unequal pathways throughout primary and secondary schooling. High school dropout rates—albeit much lower in recent decades—remain substantially higher for Hispanics and Blacks than for Whites (Heckman and LaFontaine 2006; Mishel and Roy 2006), and the relative participation and completion rates in college among students of color and those from lower socioeconomic status backgrounds remain low (NCES 2016a, b).

The education attainment model is defined by a notable tension between individual choice and structural constraints that exist throughout the life course. This is evident in the clear schism between students' intended plans and their ultimate destinations. Both academic preparation and information are key brokers in this divide. Much of our theoretical and applied policy discussions focus on how to improve the pathway to college, and, more recently, to improve college degree receipt in particular. For example, recent K–12 school reform efforts, dominated by Common Core implementation, are largely focused on improving college readiness and on better aligning our K–12 and higher education systems. Although it is too soon to tell, this effort may potentially reduce structural barriers along students' pathways to academic preparation for college. Moreover, amidst critiques that college for all has boosted students' college expectations without improving their access to quality information about what it takes to succeed in college, a plethora of interventions have surfaced from across the social sciences to aid students along their educational pathways (e.g., in their choice of college, in staying in college, and in believing they can succeed).

In the years to come, fruitful approaches to promoting educational excellence and equity will not necessarily conceive of structure and agency as competing forces—a "structure *versus* agency" approach; rather, they will acknowledge the overlapping, dynamic nature of structure *and* agency in students' educational pathways. Students form their attitudes, orientations, and decisions as they progress along structurally bounded educational pathways, subject to past experiences, opportunities, and information. As such, theoretical models and policy interventions alike that focus solely on structure (e.g., the distribution of opportunities to learn) or agency (e.g., students' choices about course selection) ignore a crucial set of factors that contribute to students' educational trajectories. Sociologists of education are uniquely positioned to develop models of education attainment that connect structure and agency, and, in doing so, to inform future refinements of policy and practice.

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