



Working Paper:

Prompts, Personalization, And Pay-Offs: Strategies To Improve The Design And Delivery Of College And Financial Aid Information

Benjamin L. Castleman¹

Policy-makers and researchers have devoted increasing attention to how the accessibility and presentation of college and financial aid information impacts whether students apply to college or for financial aid, and the college choices students make. This recent focus on informational barriers to college entry and success for low-income students has in turn prompted numerous federal initiatives to improve the quality of information that students and their families can access about college and financial aid. However, will the availability of simpler and more personalized information be sufficient to mitigate the informational obstacles that prevent low-income students from attending colleges and universities that are well-matched to their abilities and interests? In this essay I synthesize recent research in the behavioral sciences to identify strategies for improving the design and delivery of college and financial aid information. I highlight several recent experimental interventions that apply concepts from these disciplines to further improve the design and delivery of college and financial aid information. Finally, I propose several additional interventions that could meaningfully impact students' decisions at various stages in the college exploration, application, and choice processes.

¹Harvard University

Updated August 2013

Center on Education Policy and Workforce Competitiveness (CEPWC)
University of Virginia
PO Box 400879
Charlottesville, VA 22904

CEPWC working papers are available for comment and discussion only. They have not been peer-reviewed.
Do not cite or quote without author permission.

Acknowledgements: I welcome all comments and questions at castleman@virginia.edu. I completed this paper as part of the Financial Aid and Student Success: Behavioral Insights initiative funded by The Bill and Melinda Gates Foundation and Directed by Sandy Baum, Robert Shireman, and Patricia Steele. I am very grateful to Sandy Baum, Bob Shireman, Mike McPherson, and Saul Schwartz for their helpful feedback on this paper. I am also grateful to Bridget Terry Long, Chris Avery, and Sarah Turner for their helpful insights about applying behavioral sciences to the study of postsecondary education. This paper has further benefited from the feedback of seminar participants at Harvard University, The University of Virginia, and the Bill & Melinda Gates Foundation Financial Aid & Student Success June 2013 convening. This paper was generously supported by the Gates Foundation. Any errors or omissions are my own.

PROMPTS, PERSONALIZATION, AND PAY-OFFS: STRATEGIES TO IMPROVE THE DESIGN AND DELIVERY OF COLLEGE AND FINANCIAL AID INFORMATION

By Benjamin Castleman

I. INTRODUCTION

Policy-makers have invested in a range of strategies over the last several decades to reduce disparities in college entry and completion by family income. Historically, many of these interventions have focused on improving students' academic readiness and increasing college affordability for low-income students and their families.ⁱ More recently, however, policy-makers and researchers have devoted increasing attention to how the accessibility and presentation of college information impacts whether students apply to college or for financial aid, and the college choices students make.ⁱⁱ A number of studies have documented, for instance, that students and families from disadvantaged backgrounds either do not know or tend to substantially overestimate the actual cost of college tuition.ⁱⁱⁱ Other research has documented how complexities in the Free Application for Federal Student Aid (FAFSA) may deter many students who would qualify for substantial grant and loan assistance from even applying for financial aid.^{iv} A separate line of research suggests that a surprisingly large share of students who have sufficient high school achievement to attend academically-rigorous institutions often only apply to and enroll at essentially open-enrollment colleges and universities.^v

The recent focus on informational barriers to college entry and success for low-income students has in turn prompted numerous federal initiatives to improve the quality of information that students and their families can access about college and financial aid. For instance, the Higher Education Opportunity Act of 2008 required institutions that participate in Title IV federal student aid programs to post net price calculators on their websites. These calculators allow students and families to obtain personalized estimates of the net cost of attendance at that institution, given their individual financial circumstances. The United States Department of Education (USDOE) also created the FAFSA 4caster to allow students and their families to input a relatively small amount of information about family size, income, and geographic residence, and obtain an estimate of the amount of grant and loan assistance for which they would qualify. More recently, in July 2012 the Obama Administration launched the Financial Aid Shopping Sheet, an attempt to standardize and

simplify the presentation of financial aid award information across institutions. In addition, the federal government created both College Navigator and the White House Scorecard, which allow students to obtain information that has typically not been available through most privately-funded college search engines, such as retention and graduation rates.

These initiatives, in addition to a number of additional efforts by states, non-profit organizations, and individual colleges, have substantially increased and simplified the amount of institution- and family-specific college and financial aid information students can access. However, will the *availability* of simpler and more personalized information be sufficient to mitigate the informational obstacles that prevent low-income students from attending colleges and universities that are well-matched to their abilities and interests? Recent work in a range of behavioral sciences—behavioral economics; cognitive, social, and adolescent psychology; and neuroscience—implies that simplification and personalization are important first steps to address these barriers. Yet research in these disciplines also highlights the importance of going further to improve college and financial aid information. How information is presented and delivered; whether students and their families can access individualized assistance when they need it; and whether students and parents receive timely prompts to complete relevant tasks may be of additional importance.

In the remainder of this paper I synthesize what recent research in the behavioral sciences suggests about how people process and make decisions based upon information they receive. I focus in particular on adolescent postsecondary decision-making, but many of the same insights would apply to adults who are interested in continuing their education. I highlight several recent experimental interventions that apply concepts from these disciplines to further improve the design and delivery of college and financial aid information. Particularly as local, state, and federal governments continue to grapple with limited funding for college access initiatives, these interventions are particularly promising given the magnitude of their impacts relative to their costs. Finally, I propose several additional interventions that could meaningfully impact students' decisions at various stages in the college exploration, application, and choice processes. These suggested interventions are not meant to replace individualized, high-quality counseling, but rather to provide policymakers who face budgetary constraints with cost-effective strategies to supplement existing services available to students.

II. BEHAVIORAL SCIENCES PERSPECTIVES ON HOW PEOPLE PROCESS AND RESPOND TO INFORMATION

Perhaps the most important question to address is why College Navigator, the Net Cost Calculators, and tools like them may not be sufficient to address the informational barriers faced by low-income students and their families as they navigate the college and financial aid processes. After all, in the space of a prime time reality television episode, students can use these sites to identify several institutions in their geographic area from which they have a high probability of graduating and which offer the lowest net costs. The process of identifying potential colleges and universities that are well-matched to the student's interests and abilities has arguably never been more straightforward. Yet the current design and structure of these tools make several assumptions about how students and parents access and respond to information that may compromise their effectiveness.

First, the federal college and financial information tools, along with their state and private counterparts, require that students and parents both know about their existence and will set aside time to make use of them. Both expectations are potentially untenable. Many public high school students have limited access to college counseling, through which they would conceivably learn about these tools. Nationally, the average counselor caseload of 457 students is nearly twice the ratio recommended by the American School Counseling Association.^{vi} Counselors in public schools spend only 22 percent of their time on college admissions, compared with 54 percent among private school counselors.^{vii} Moreover, counselors typically lack a thorough understanding of the financial aid process and may not feel prepared to guide students to apply for aid or evaluate financial aid packages.^{viii} Of potentially even greater concern, online college search tools require that students and their families have internet access, yet recent research by the Pew Internet and American Life Project suggests that the majority of students from low-income households may be unable to make use of these online tools from home. In a 2013 survey of Advanced Placement and National Writing Project teachers (teachers who are perhaps most likely to have college-bound students in their classrooms), Pew found that over half of teachers reported that most or all students from higher-income families regularly had access at home to the digital tools (e.g. online search engines) they

needed to effectively complete school assignments.¹ By contrast, only three percent of teachers reported that most or all of students from the lowest-income families had regular access to the digital tools necessary to complete school work.^{ix}

Even among adolescents who are aware of these tools and who have reliable internet access, however, it may not be realistic to assume that they will be sufficiently disciplined to budget time to make use of them. Recent work in neuroscience confirms what parents of all adolescents (regardless of socioeconomic status) have always known implicitly: that the neurological systems that respond to immediate stimulation are at their peak activity during the teen-age years, yet brain systems required for self-regulation are still in development. As a result, adolescents are more impulsive, less likely to consider the long-term consequences of their present actions, and more likely to put off onerous tasks in favor of more pleasurable pursuits.^x Neural transformations that take place during adolescence are also shaping individuals' ability to perform higher-order cognitive functions, like organization, attention, and planning.^{xi} Yet these transformations continue into well into the early- to mid-20s, so many teen-agers may struggle to keep track of their belongings; maintain attention for longer periods of time; and/or plan the sequence of steps required to complete complex tasks. At the most basic level students may not remember how to access college search tools, even if they were given a handout in school or sent an email by a school counselor (think about the organizational state of a teen-ager's back pack or email in-box). Strongly college-intending students may still not identify researching institutional graduation rates and net costs as important steps in the college-planning process. The cognitive load required to process college information may be particularly daunting and taxing for students from disadvantaged backgrounds who have to devote their time and energy to addressing immediate stressors, like financially supporting their families or dealing with neighborhood violence.^{xii}

Another potential shortcoming in the design of college and financial aid information is that tools designed to educate students about their postsecondary options implicitly assume they will be able to learn independently, without additional professional assistance. This may also be an unrealistic assumption. Because adolescents' higher-order cognitive functioning is still in development, they often need help organizing and analyzing multiple strands of information;

¹ An important point to note is that a lack of regular access does not necessarily mean that the student did not have internet access in his/her home. Instead, it is possible that students did not have regular access to the computer because other family members also needed to use it for school/professional work.

understanding the connection between their college choices and future opportunities; and addressing sources of stress that impact their college planning.^{xiii} The process of identity formation is still ongoing, so adolescents may also struggle to define what they want from their adult lives.^{xiv} Without clear goals in mind, students may be particularly reliant on outside guidance to assess which postsecondary paths best align with their interests and abilities.

Many for-profit enterprises, like banks and cable companies, recognize that clients may struggle to process the information available on their web sites. Anticipating this confusion, they prominently advertise a range of help options, such as live chats and 24/7 call centers. The same is not true of many of the college and financial aid information sites, where it is often unclear where students can turn for help. As I describe above, students' school counselors are unlikely to have sufficient capacity or training to provide detailed guidance (particularly on financial aid questions). Depending on the community in which they live, there may be few community-based resources. If students are the first in their family to go to college, their parents may not be able to provide sufficient direction.

Among college-educated families, parents implicitly recognize the importance of providing structure and accountability to compensate for their adolescents' cognitive challenges, and accordingly invest considerable time in the college process.^{xv} The depth and intensity of middle-class parents' involvement in college search and completing college applications is perceived to be so great, in fact, that the term "helicopter parent" has become well-entrenched in the popular lexicon.^{xvi} College-educated families are also considerably more likely to pursue "shadow education" for their children, such as private tutoring and SAT prep courses.^{xvii} Adolescents from disadvantaged backgrounds are considerably less likely to benefit from parental guidance and involvement in the college process. One challenge is that parents from low-income families are more likely to work non-standard hours and to experience unpredictable shifts in their work schedules.^{xviii} As a result, lower-income families may struggle to establish regular family routines that are conducive to parents helping their child with college applications.^{xix} Psychological barriers may also inhibit low-income parents from engaging in college planning with their child: they may not believe their involvement would positively influence their child, or they may question whether the colleges allow for their involvement in the process.^{xx} Particularly if parents did not go to college themselves, they may rely

on the high school to guide the child through the college process because they do not know how to do so themselves.^{xxi}

In short, faced with strong biological impulses that privilege immediate pleasures over longer-term considerations and lacking sufficient adult guidance and structure, teen-agers from disadvantaged backgrounds may not thoroughly engage in college search, even if they plan to pursue postsecondary education.

A related limitation of current college and financial information is that the available tools still involve substantial cognitive processing for students, and require adolescents to choose among a multitude of factors to identify a well-matched set of institutions. For instance, to obtain an estimate of the net price they would pay at a particular college, students need to know, among other information, which federal income tax forms their parents submitted for the previous tax year; how much their parents earned from interest and dividend income; whether their parents claimed educational tax credits; and how much their parents contributed to retirement plans. For the same neurological reasons that students may be unlikely to set aside time to make use of online college search tools, they may not remember to ask their parents for this information, or may have difficulty making a comprehensive plan for all the information they need to gather. They may struggle to persuade their parents of the importance of sharing this information, particularly if their parents do not speak English or have concerns about the privacy of the information they provide.^{xxii} At an even more basic level, because low-income adults are more likely to work non-standard hours, there may be limited hours during the week when students can even connect with their parents to assemble this information.

Similarly, many college search tools expect that students can evaluate a wide range of factors in deciding which colleges and universities best match their interests in abilities. Yet the volume and complexity of this material may be more likely to produce information overload for students than to illustrate a set of well-matched colleges and universities. Using College Navigator as an example, after students indicate the state in which they want to go to college and the level and type of institution they want to attend (public vs. private, two-year vs. four-year), they are given a list of all the colleges that meet these basic criteria. Once students click on a specific college, there are twelve category headings of institution-specific information, ranging from “tuition, fees, and estimated student expenses” to “campus security.” Within a given heading, there are extensive tables of

detailed information; in the case of campus security, for example, College Navigator gives students statistics on the number of arrests on-campus and on-campus in residence halls, as well as information on a broader set of criminal offenses, over a several year time period. Across all twelve categories, there are literally hundreds of data points for students to consider. Comparing multiple institutions would require students to digest and assess an extraordinary volume of information.

What the designs of sites like the College Navigator fail to sufficiently take into account is that too much complexity can create a “paradox of choice” for students.^{xxiii} People—and adolescents in particular—often struggle to methodically evaluate and compare alternatives that differ on many attributes.^{xxiv} In fact, as the choices become more complex, individuals are more likely to opt for a simplifying strategy to make their selection.^{xxv} From a policy perspective, the challenge is that the simplifying rule a teen-ager adopts may not lead them to choose a postsecondary plan that best positions them for future success. Of particular concern is that students may base their postsecondary decisions on factors that have appeal in the short term, like being close to a high school girlfriend, but that may not contribute to their long-term well-being. Even among students who are determined to pursue postsecondary education, rather than select the institution with the highest graduation rate, lowest net cost, and best academic support services, students may instead simplify their choice to focus on attributes that are very tangible but potentially less related to whether they will be successful, like nice dorm rooms or good food. Yet attending institutions with these features may require the student to incur substantial debt without meaningfully increasing their probability of future success. As a result, search tools that were intended to equip students with the information necessary to make fully-informed college choices may ironically lead them to base their decisions on a small and superficial set of factors.

It is worth noting that this tendency to simplify the college decision to a superficial set of factors is likely true for most adolescents. For students from middle- and upper-income families, however, these simplification strategies are less likely to be constraining, however, since their parents and counselors likely encourage them to consider a broader range of college characteristics when deciding where to apply, and later matriculate. Adolescents from disadvantaged backgrounds, on the other hand, may not have adults in their lives who can offer broader perspective. As a result, they are more likely to pursue a set of postsecondary choices that are bounded by less-informed considerations.

Finally, current college and financial aid information makes the costs to students very concrete, yet the potential benefits remain quite hazy. Recent research in behavioral economics suggests that individuals often over-weight immediate costs and forego investments that would be in their long-term interest.^{xxvi} Even minor cost barriers may deter students from completing key stages of the college application or choice processes, despite a high probability that the lifetime benefits of higher education would far outweigh short-term investments.^{xxvii} Students may also face liquidity constraints that prevent them from paying for mandatory fees associated with college applications, deposits, and freshman orientation.² These costs are likely to loom particularly large when the potential benefits associated with college seem quite opaque. Low-income students who were unable to visit their intended college and who received little college counseling in high school may have difficulty visualizing the academic and social dimensions of college life. While tools like the net cost calculators provide personalized estimates of what students will pay for college, there are currently not corresponding tools that provide students with personalized estimates of the financial return to college that they would likely realize if they matriculated. In fact, much about the college experience may feel very undefined to first-generation college students: whether they will succeed academically; whether they will form new friendships; whether the education and credentials they receive will outweigh the debt they have to incur. Faced with this uncertainty, students may be averse to foregoing the predictability of their current lifestyle.^{xxviii} This reluctance to pursue college may be particularly pronounced for students who are deciding whether to attend a residential college, since doing so would require students to opt for an unfamiliar environment and uncertain gains over the stability of their current community and relationships.

Strategies to improve the design and delivery of college and financial aid information

Behavioral sciences research thus highlights a range of limitations in the college and financial aid information currently available to students. Yet these disciplines also offer valuable guidance on how information design and delivery could be improved to increase accessibility for students and their families. It is worth emphasizing that the types of behavioral interventions I propose are not meant to substitute for high-quality college counseling. In the ideal world, all students would have access to the kind of personalized, in-depth college counseling that affluent families can afford for

² There is a related informational barrier, since students may be able to qualify for fee waivers for any of these charges, but they may not know these fee waivers are available.

their children. But for many policymakers and school leaders, providing additional counseling may not be a fiscal reality, whereas low-cost behavioral interventions may be feasible.

It is also worth noting that, in some cases, improvements to the design and delivery of college and financial aid information will necessitate providing students and their families with different information about college than what they currently receive. Yet this creates an inherent tension, since doing so potentially introduces additional complexity about college and financial aid. In the final section of the paper, I address this tension directly by offering a set of suggestions for how information could be enhanced based on principles from behavioral sciences while minimizing the risk of information overload. In short, I argue for actively guiding students and their families to consider certain data points before others (e.g. graduation rates). I also advocate for providing information in sequenced increments, so students and their parents progressively learn more about their college options and are able to narrow down a list of viable alternatives without having to digest a large set of information all at once.

One important lesson from the behavioral sciences is that people benefit from prompts to engage in important activities. Procrastination and forgetfulness frequently interfere with whether individuals—and adolescents in particular—follow through on beneficial behaviors.^{xxxix} Especially if the important event is far into the future, people often struggle to maintain focus on all of the tasks they need to complete in order to achieve the longer-term goal.^{xxx} Providing prompts, however, can trigger people’s awareness of the tasks they need to complete, and encourage them to deal with the task in the present, rather than putting it off into the future. Prompts have been demonstrated to have positive impacts in a range of settings. Researchers in the public health and development economic sectors, for instance, have found that sending people text message reminders increased flu vaccination rates and whether individuals contributed to financial savings accounts.^{xxxi} H.I.V. patients whose pill bottles lit up and beeped each day if they were not opened were more likely to take their medication^{xxxii}; individuals were more likely to schedule a colonoscopy if they received a post-it note prompting them to write down the date of their appointment and the name of the physician who would be conducting the procedure.^{xxxiii} In the context of college and financial aid information, prompts could be used to encourage students and their families to access available information at key stages in the college and financial aid processes. For instance, school districts or

state education agencies could send high school students text message prompts to apply for financial aid during the spring of their senior year.

Providers of college and financial aid information could also go beyond providing prompts, and bring simplified and/or personalized information right to the student and his/her family. Behavioral economists have frequently pursued this strategy to increase individuals' retirement savings. As with postsecondary information, employees who are eligible to participate in retirement plans face a daunting array of options for how they could invest their money. The complexity of these choices often leads people to put off investing anything, even when they would clearly benefit financially from doing so.^{xxxiv} One strategy to increase retirement contributions has been to collapse the broad range of retirement options into one plan with a pre-determined contribution rate and asset allocation in which employees can enroll.^{xxxv} This approach overcame the complexity employees faced in their retirement decisions, and therefore increased the rate at which they benefited from the financial incentives offered by their employer's retirement plans. Analogously, educational agencies could collapse the broad and complex range of college choices that students face into a simplified set of options tailored to each student's academic profile and geographic residence. For instance, state agencies or school districts could recommend colleges for high school juniors to consider applying to that are close to where the students live, that meet certain benchmarks in net costs and graduation rates, and that the students have a good chance of being admitted to based on their academic profiles.

Related to the idea of providing students with prompts and personalized information is the question of how information is delivered. As I discuss earlier, most college and financial aid information is passive: tools are available, but students and their families have to seek them out. To the extent that high schools, community-based organizations, or colleges proactively communicate with students, they typically do so through handouts, US Postal Mail, or email. Yet postal mail and email are not the primary means of communication among adolescents. Whereas only six percent of teens exchange emails on a daily basis, 63 percent send texts every day.^{xxxvi} The information that institutions are sending to students about college or financial aid may therefore not even be reaching them, let alone inducing further college exploration.

For college and financial aid information to be more accessible to students, it is also important to minimize barriers to help-seeking. The psychological literature has documented a range

of factors, including adolescents' perception of their academic and social competence, their level of motivation, and their attitudes towards help-seeking, that influence whether students pursue assistance with school-based problems.^{xxxvii} In under-resourced schools where counselors have large caseloads and limited time to focus on college planning, high school graduates may have limited personal relationships with counselors. This lack of a personal connection may inhibit students from initiating contact with a counselor to request assistance. On the other hand, students may be quite responsive to proactive and direct outreach from a counselor to discuss college- and financial-aid related issues. Students may be particularly responsive if they can signal their interest in meeting to discuss college and financial aid through media, like text messaging or Facebook messaging, that require less relational investment.^{xxxviii}

College and financial aid information could also potentially be more effective by taking into consideration students' perceptions of the social norms around postsecondary choices. A broad literature has documented that the behavior of peers in a social environment influences individuals' responses.^{xxxix} In uncertain situations, individuals may be particularly influenced by peer behavior if they believe that following the actions of others will lead to better outcomes.^{xl} Individuals may also be more influenced by the actions of peers whom they perceive to share similar features, such as age and gender.^{xli} Specific to postsecondary decision-making, students from underrepresented groups may not feel that they belong at colleges and universities if they perceive these institutions to be the domain of affluent, white students.^{xlii} They may also be concerned that they would need to downplay their group identity in order to succeed in college.^{xliii} Students' uncertainty about whether they would fit in on campus may result in greater stress, further impeding their ability to complete required tasks over the summer.^{xliv}

Currently, much of the information provided by college search tools is individualistic in its orientation (i.e. “how much will college cost *me*? What major(s) can *I* pursue? How likely am *I* to get in?”). This information could be enhanced to provide students with a more palpable sense of the social attributes of the college experience. Individual colleges have capitalized on this concept by promoting a social identity associated with attending that institution (e.g. “The Morehouse Man”).³ Of several major college search engines (College Navigator, The College Board search tool, and the ACT search tool), however, only the College Board provides information on student activities, and

³ I am indebted to Michael McPherson for this helpful observation.

its presentation of the social experience is limited to a static list of some of the student groups on each campus. Low-income students who have never been on a college campus and who did not grow up hearing college anecdotes from family members would likely respond positively to a more tactile presentation of the social dimensions of higher education. At the simplest level this could be achieved by actively highlighting some of the student activities available at each college/university. This information does not need to be restricted to residential colleges: many community colleges and commuter institutions also have a range of student groups and activities on campus. A more sophisticated approach would be to allow students to identify personal characteristics that are central to their identity (race/ethnicity, religion, sexual orientation, etc.), and customize which aspects of collegiate social life are presented to each student. This personalized view of opportunities for social engagement with relevant campus groups could be particularly impactful for students who have little familial experience with or conception of college.

Because individuals tend to prefer certain benefits over potential gains,^{xlv} college and financial aid information could also be improved by concretizing the advantages, both financial and non-pecuniary, of going to college. This may be particularly important for low-income students who would be the first in their family to go to college, for whom college may feel like a particularly risky gamble relative to the certainty of their current relationships and environment. One approach to concretize benefits would be to provide students with a personalized estimate of what their annual earnings could be with a college degree, given the type of institution to which they would have a good chance of being admitted and the field of study they are interested in pursuing. Admittedly, this estimate would be a ball park approximation at best, and would need to acknowledge both the institution-specific probabilities of earning a degree and the considerable variation in earnings among degree-holders. Particularly given the sizeable earnings gaps between college graduates and high school graduates,^{xlvi} however, additional personalized information about the returns to college could positively influence students to apply and attend, even with the risks and uncertainties involved. In collaboration with College Measures, a partnership between the American Institutes for Research and the Matrix Knowledge Group, several states have recently moved in this direction by making information available online about the average earnings among graduates from in-state institutions, and/or from specific college majors.⁴

⁴ For more information, visit: www.collegemeasures.org

Given the research I document earlier about the time horizon adolescents consider in their decision-making, however, concretizing the benefits of the college experience may be even more important than emphasizing the benefits they would accrue years down the road. One strategy for doing so would be to provide the kind of personalized glimpses of the collegiate social experience I describe above. In addition, college search engines could emphasize other aspects of campus life that may be attractive to students, such as better employment opportunities than in their neighborhood or improvements in community safety.

Finally, research in behavioral economics highlights the importance of individuals making choices in context, rather than evaluating each option in isolation.^{xlvii} An individual college may seem particularly attractive to a student because of the quality of its dorm rooms and athletic facilities; similarly, another college may be unattractive because its list price appears prohibitively high. Yet to make fully-informed choices, students and their families would ideally consider the gains and drawbacks of each institution relative to other potential options. Accordingly, college information should facilitate students making apples-to-apples comparisons between institutions. While some search engines currently have this functionality in place, they do not necessarily include comparative information that may be particularly important for or impactful on the student, such as graduation rates and opportunities for social engagement.

In the same way that consumer sites like Amazon recommend products based on shoppers' searches, institutional comparisons could also be further enhanced by proactively generating recommendations of additional colleges students should consider based on their initial explorations. These recommendations could be tailored to suggest colleges and universities that meet certain graduation and net cost benchmarks, and that are geographically proximate to the student. Of arguably even greater importance would be to help students and their families consider in concrete terms the potential implications of *not* going to college when they are evaluating postsecondary options. That is, when students decide not to apply to or attend college, they are not necessarily making an affirmative choice to pursue a preferred alternative. Particularly if quality alternatives are scarce, information that effectively communicates the advantages and drawbacks of college relative to the pros and cons of students' best other option could influence whether students decide to pursue higher education. One strategy that may be particularly effective is to help students

understand what they are losing, so to speak, if they choose not to pursue higher education (e.g. potential for greater earnings, engaging social experiences, etc).

III. APPLICATIONS OF BEHAVIORAL SCIENCES TO IMPROVE THE DESIGN AND DELIVERY OF COLLEGE AND FINANCIAL AID INFORMATION

As the previous section highlights, there are a variety of mechanisms through which the improved information and/or the offer of assistance could increase the probability that students matriculate in college. Information and counseling may increase students' willingness to make short-term investments in expectation of longer-term benefits associated with higher education. With improved information and counseling, students may also overcome the complexities in college and financial aid information. Finally, with regular reminders, students may be better able to devote time to task completion incrementally throughout junior and senior year of high school, and therefore increase their probability of enrollment.

As several recent studies indicate, offering students additional counseling and/or personalized information during the college process does indeed have a substantial impact on whether they enroll in college. The majority of these studies have fallen into one of two broad categories: 1) interventions that provided students with individualized assistance and 2) interventions that provided students with personalized information and prompts, and in some cases the offer of additional assistance. I focus in particular on studies that have employed experimental methodologies. Given their high internal validity, these studies isolate the unique impact of behavioral intervention on students' college outcomes, and demonstrate the magnitude of impact that similar interventions may be able to achieve for a relatively small investment.

Interventions that provide students with individualized assistance

Researchers have examined a range of strategies for providing students and families with individualized assistance with the college or financial aid processes, beyond what they receive in school. Several studies have employed peer mentors to provide students with individualized help throughout the college process. Across different geographic contexts and stages of the college process, students who were randomly assigned to receive peer mentor support were substantially more likely to enroll in college. For instance, high school seniors in Los Angeles who received regular support with the application process from a college student were several percentage points

more likely to attend a four-year institution.^{xlvi} Similarly, researchers matched Dartmouth College students with New Hampshire high school seniors who were behind in the application process. The college mentors met weekly with students during the second half of senior year to help them complete their college applications. The intervention had a pronounced impact for females, but not for males. Females in the treatment group were 12 percentage points more likely to enroll in college; this difference persisted into the second year of college.^{xlix}

Peer mentor programs that provide outreach to students the summer *after* high school graduation have also positively impacted whether they enroll in college. The post-high school summer is a largely-overlooked time period in students' transition to college. Students have to complete a range of tasks, such as interpreting and acting on their financial aid award letters and tuition bills and registering for orientation and placement tests, yet typically do not have access to professional assistance to help with these tasks. Students are no longer part of their high school, so cannot access help from their school counselors, but have yet to engage with supports available at their intended college.¹ High school graduates in three urban Massachusetts districts and from a network of charter schools in Philadelphia were randomly assigned to receive summer outreach and support from peer mentors working under the guidance of professional counselors or financial aid advisors. Throughout the summer, the mentors proactively reached out to students to offer them help addressing potential barriers to college enrollment, and to connect them to professional counselors if they needed additional assistance. Across sites, students randomly assigned to receive peer mentor outreach were 4.5 percentage points more likely to enroll at four-year institutions; male students who received outreach from male mentors appeared to particularly benefit from the intervention.ⁱⁱ

Several studies have also examined the impact of offering students additional help directly from school counselors or community-based financial aid advisors during the summer after high school. To investigate the impact of providing students with summer support, researchers randomly assigned students in Providence, RI, Boston, MA, and Fulton County, GA several hours of additional college counseling. Counselors helped students interpret and act on their financial aid packages and tuition bills; access, digest, and complete required paperwork; and address potential social/emotional barriers to enrollment. The offer of 2 – 3 hours of additional support during the summer increased college enrollment by 5 – 14 percentage points, and in Boston (the only site for

which the researchers have been able to examine longer-term persistence trends to date), increased sophomore year persistence by almost nine percentage points.^{lii}

Researchers have also examined the impact of offering students and their families individualized assistance with and information related to the federal financial aid application. Low-income adults who went to H&R Block for their income tax preparation were randomly assigned the offer of help with the FAFSA for themselves or their children. In addition, adults in the treatment group were provided information about their estimated financial aid eligibility compared to the cost of tuition at several nearby colleges. Helping parents complete the FAFSA following their income tax preparation took H&R Block tax professionals less than 10 minutes, but led to an eight percentage-point increase in the probability that their children remained enrolled continuously enrolled in college for at least two years following high school.^{liii}

Each of the studies described above utilized individualized assistance—either from peer mentors, school counselors, or financial aid professionals—to help students and their families overcome complexities in the college and financial aid application processes. The H&R Block intervention (\$88 per participant) and the summer college counseling interventions (\$100 - \$200 per participant) were particularly cost-effective strategies to increase college-going among disadvantaged students, while the peer mentor interventions tended to be somewhat more expensive approaches (\$100 - \$1,000).

Two recent studies suggest that providing students with personalized and timely information can yield enrollment impacts of similar magnitude, but with even greater cost efficiency. Capitalizing on records of students' SAT or ACT scores, their geographic residence, and an estimate of their family income, researchers sent high-achieving, low-income seniors in the 2010-2011 and 2011-2012 high school cohorts semi-customized information about the college application process and about the net cost of attending colleges. Students were randomly assigned to one of several intervention groups, in which they received different combinations of information. For instance, students in one intervention group received comprehensive guidance on how to apply to a set of institutions matched to their academic ability. In another intervention groups, students received information about the net costs of college, while in a third group, students received fee waivers for their college applications. In a final intervention, students received both the application guidance and net cost information and the application fee waiver. The latter comprehensive intervention, which cost only

\$6 per student, had a particularly pronounced impact, increasing the rate at which students applied and were accepted to and matriculated at institutions with higher graduation rates and more resources.^{liv}

In a separate study in summer 2012, researchers sent high school graduates and their parents 8-10 text reminders of important tasks to complete in order to matriculate in college. The text messages were customized to the colleges students planned to attend, and provided timely reminders of important tasks to complete, such as interpreting and acting on financial aid award letters and registering for orientation. Most of the messages also included task- and college-specific web links that enabled students to complete tasks directly from their phones, before their attention was diverted to other activities. Each message also offered students and their parents individualized assistance from a school counselor. The intervention cost approximately \$7 per student (counting counselor support when students requested help to complete tasks) and increased enrollment by over four percentage points among students qualifying for free- or reduced-price lunch in a large urban district in the southwestern United States, and by over seven percentage points among students in two urban school districts in Massachusetts.^{lv}

IV. ADDITIONAL INTERVENTIONS TO INCREASE STUDENT AND FAMILY RESPONSIVENESS TO COLLEGE AND FINANCIAL AID INFORMATION

Thus, interventions that increase the simplicity and personalization of college and financial aid information may be able to substantially increase college entry and success among low-income populations. While there have been relatively few field interventions applying behavioral insights to date, these early studies reinforce research in other fields that demonstrate the potential of information simplification and prompts to shape individual decision-making. I close by discussing several additional low-cost and easily-scaled interventions that would similarly apply principles and concepts from the behavioral sciences to increase the accessibility of college and financial aid information.⁵

One place to start would be to refine college search tools to share additional salient information with students (e.g. about the social dimensions of college and the returns to

⁵ Many of these intervention ideas emerged from ongoing collaborations with several researchers, including Chris Avery, Josh Goodman, Doug Harris, Bridget Terry Long, Mike Luca, Lindsay Page, Bruce Sacerdote, Barbara Schneider, and Bill Skimmyhorn.

postsecondary education), while minimizing the problem of information overload. The solution in doing so likely lies in providing intentional structure and sequence to the way that information is presented.^{lvi} Rather than treat all information as of essentially equal value, college search engines could both personalize and prioritize particularly important considerations. In the same way that many commercial websites prompt visitors to enter in their zip code to provide more user-specific content, college search engines could prompt students for their zip code to first feature colleges and universities within a reasonable geographic proximity. Within this set of institutions, college search tools could then highlight key factors about each institution, like their average net cost and graduation rate. The US Department of Education’s College Scorecard, released in February 2013, takes this approach of emphasizing a small set of essential attributes about each college and university.

One criticism of the Scorecard is that it reduces the college decision to an overly narrow set of factors. However, once students have identified a subset of institutions that are within a comfortable geographic radius and that maximize their chance of graduating without incurring an excessive loan burden, search tools provide students with another set of factors to consider about each college. Again, sites could prompt students to anonymously share additional personal details, such as ethnic and cultural groups with which they have affinity, to further customize the search results. College search sites could make strategic decisions about the order in which information is shared. For instance, after first narrowing institutions by cost and graduation rates, sites could provide students with information about the returns to higher education and the social dimensions of college. Once students further narrow their choice set of potential colleges and universities, the sites could then share additional characteristics of each institution, such as academic programs offered and student employment opportunities.

The primary advantage of this approach is that, for students from disadvantaged backgrounds without sufficient access to professional guidance, college counseling would essentially be built into the site. Much as if students were working with an independent college consultant, the site would learn about the student; make specific college recommendations based on this acquired information; and select important attributes about each institution to share with the student. Just as if students were working with a consultant, they would not be restricted from conducting a wider and less-structured search on their own: at each stage in the process, the sites could be designed so

that students could still opt to view a broader set of institutions, or additional details about each college and university in their choice set.

The personalization and prioritization of information could be further enhanced in two important ways. First, college search sites could partner with social network platforms like Facebook to provide an even more personalized viewing experience. If students were logged into their Facebook account, for instance, the personalized college recommendations could be based on a rich set of information about the student: where they live; the kind of groups with whom they have identified an affinity; where students from their high school or community have successfully enrolled. Another enhancement to the basic refinement would be to provide students with access to real-time support via a chat or instant message function built into the college search site. In this sense, personalized college counseling could be incorporated into the platform by enabling students to get individualized guidance about their college options. Particularly if implemented at a state or federal level, this approach could also be a more cost-effective approach to increasing students' access to college counseling than adding counseling capacity to many individual schools or districts. Another advantage is that, as with corporate sites that offer live chat, the real-time support could be available to students during nights and weekends, when they may be more likely to be exploring their college options.

A different approach would be to apply the strategy of sending students personalized and timely text messages at earlier stages in the college exploration process. One potential barrier that personalized messaging could address, for instance, is that high school students from disadvantaged backgrounds do not have a full sense of the range of colleges to which they would likely be admitted based on their academic achievement. Researchers or policy makers could draw on student- and college-level data to send high school juniors personalized recommendations of colleges to consider applying to, based on their academic profile and geographic residence. The recommendations could be delivered via text message, and could highlight institutions that meet certain benchmarks in graduation rates and net costs, and to which the student has a good chance of being admitted. As with the summer text message campaign, each message could also offer high school juniors individualized assistance with the college application process.

Text messaging (or digital messaging more broadly) could likewise be leveraged to provide students and their families with personalized information at other important stages in the college

planning process. For instance, low-income students who perform well on state assessments or national exams like the PSAT may nonetheless not recognize the benefits of taking rigorous courses like Advanced Placement exams; not have access to these courses; or not have access to sufficient academic support to succeed in these courses. Researchers or policy makers could send personalized messages that encourage students to take AP courses; offer to connect them to online AP courses if their high school does not offer a sufficient range of AP options; and offer to connect them to online tutoring if they need assistance in more rigorous courses. Digital messaging could also be used to prompt high school seniors who have not applied to college but appear college-ready based on their academic records to complete applications before high school graduation.

Another strategy would be to harness the reach and influence of social networks to nudge students to complete important college and financial aid tasks. Researchers recently applied this concept to influence voting behaviors in the 2010 US mid-term elections.^{lvii} On November 2, 2010, domestic Facebook users over 18 years old were randomly assigned to receive a message at the top of their news feed reminding them to vote. Users could share that they had voted with their friends, and were able to see a counter of how many of their friends had already voted. Users assigned to receive these messages were more likely to actually vote on election day. Voting impacts were even greater for the users' friends, particularly for close friends that the user likely interacted with in person on a regular basis. A parallel approach could be used to encourage students to register for the SAT or ACT exam, or to complete the FAFSA. As with the voting study, these tasks may be particularly appropriate for a social network nudge because there are common and discrete deadlines faced by all high school students within a given state.⁶ Social network sites like Facebook also have the functionality, like instant messaging and live chat capability, to provide students with in-the-moment, professional assistance if they need help with any aspect of their college or financial aid applications.

An even lower-touch but potentially impactful intervention would be to capitalize on the rich information available from individuals' web searches to identify people whose profiles suggest they are from disadvantaged backgrounds and of an age where they could be applying for college. In the same way that for-profit companies use this information to target people with customized product-oriented advertisements, policy makers or researchers could target adolescents with

⁶ States have different priority dates for FAFSA submission. Both the ACT and SAT exam are administered at several points during the year, with registration deadlines in advance of each test administration.

advertisements that encourage them to register for college entrance exams, complete the FAFSA, or search for college. Ad-clicks could bring users to web pages that provide simplified information about college and financial aid. The web page to which students were directed could also prompt students to share basic information about their geographic residence and academic performance in high school, and offer more personalized guidance, as well as access to individualized assistance.

V. CONCLUSION

Policy makers have invested in a range of strategies over the last several decades to reduce disparities in college entry and success by family income. Recent initiatives have focused on increasing students' and families' access to better information about their college and financial aid options, and have substantially increased and simplified the postsecondary information to which students have access. Yet recent work in the behavioral sciences suggests that simply making better information available may not be sufficient to meaningfully influence students' and families' decision-making about higher education. These disciplines highlight the importance of bringing high-quality and personalized information directly to students and their parents; of providing students with prompts and reminders to complete important tasks in both the college and financial aid processes; and of minimizing barriers to students and families accessing professional and individualized guidance when they need assistance. A growing body of recent research has applied these principles to the design of college access interventions, and has consistently found pronounced and positive impacts on whether students enroll and succeed in college. Equally importantly, these interventions are typically low-cost and easily-scalable. Particularly as governments continue to grapple with constrained budgetary resources, policies and programs that deliver personalized information and that facilitate access to professional assistance will likely play an increasingly essential role in policy efforts to improve the postsecondary and career prospects of students from disadvantaged backgrounds.

Works Cited

- Acs & Loprest, 2005. *Who are low-income working families?* Washington, D.C.: The Urban Institute.
- Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college.* Washington, D.C.: U.S. Department of Education.
- American School Counselor Association. (2012). Student-to-School-Counselor Ratios. Retrieved July 26th, 2012 from: <http://www.schoolcounselor.org/content.asp?contentid=658>
- Arnold, K.C, Fleming, S., DeAnda, M., Castleman, B.L., & Wartman, K.L. (2009). The summer flood: The invisible gap among low-income students. *Thought and Action, Fall 2009*: 23-34.
- Avery, C., & Kane, T.J. (2004). Student perceptions of college opportunities. The Boston COACH program. In C. Hoxby (ed.). *College choices: The economics of where to go, when to go, and how to pay for it.* Chicago: University of Chicago Press.
- Baum, S., Ma, J., & Payea, K. (2010). *Education Pays.* New York: The College Board.
- Berman, J., Ortiz, L., & Bos, J. (2008). *Evaluation of the SOURCE program: An intervention to promote college application and enrollment among urban youth.* Berkley Policy Associates.
- Beshears, J., Choi, J.J., Laibson, D., & Madrian, B.C. (2012). *Simplification and saving.* National Bureau of Economic Research Working Paper No. 12,659. Cambridge, MA.
- Bettinger, E., Long, B.T., Oreopoulos, P., & Sanbonmatsu, L. (2012). The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment. *Quarterly Journal of Economics*, 127(3): 1205-1242.
- Boldero, J., & Fallon, B. (1995). Adolescent help-seeking: What do they get help for and from whom? *Journal of Adolescence* 18: 193-209.
- Bond, R.M., Fariss, C.J., Jones, J.J., Kramer, A.D.I., Marlow, C., Settle, J.E., & Fowler, J.H. (2012). A 61-million person experiment in social influence and political mobilization. *Nature*, 498: 295-298.
- Bowen, W.G., Chingos, M.M., & McPherson, M.S. (2011). *Crossing the finish line: Completing college at America's public universities.* Princeton, NJ: Princeton University Press
- Buchmann, C, Condrón, D., & Roscigno, V. (2010). Shadow education, American style: Test preparation, the SAT and college enrollment. *Social Forces* 89:435-62.
- Camerer, C., Babcock, L., Loewenstein, G., & Thaler, R. (1997). Labor supply of New York City cabdrivers: One day at a time. *The Quarterly Journal of Economics*, 112(2): 407-441.

- Carrell, S., & Sacerdote, B. (2012) Late interventions matter too: The case of college coaching in New Hampshire. Paper presented at the Summer Institute of the National Bureau of Economic Research.
- Casey, B.J., N. Tottenham, C. Liston, and S. Durston. (2005). Imaging the developing brain: What have we learned about cognitive development. *Trends in Cognitive Sciences* 9(23): 104–110.
- Casey, B., Jones, R.M., & Somerville., L.H. (2011). Braking and accelerating of the adolescent brain. *Journal of Research on Adolescence* 21(1): 21 – 33.
- Castleman, B.L., Arnold, K.C., & Wartman, K.L. (2012). Stemming the tide of summer melt: An experimental study of the effects of post-high school summer intervention on low-income students' college enrollment. *The Journal of Research on Educational Effectiveness* 5(1): 1 – 18.
- Castleman, B.L., & Page, L.C. (2013). A trickle or a torrent? Understanding the extent of summer “melt” among college-intending high school graduates. *Social Sciences Quarterly*.
- Castleman, B.L., & Page, L.C. (2013). *Summer nudging: Can text messages and peer mentor outreach increase college going among low-income high school graduates?* Paper presented at the Society for Research on Educational Effectiveness Spring Conference. Washington, D.C.
- Castleman, B.L., Page, L.C., & Schooley, K. (2012). *The Forgotten Summer: The impact of college counseling the summer after high school on whether students enroll in college.* Paper presented at the Annual Meeting of the Association for Public Policy Analysis and Management.
- Chabris, C., Laibson, D., & Schuldt, J. (2008). Intertemporal choice. *Palgrave Dictionary of Economics*.
- Cialdini, R.B. (2001). *Influence: Science and practice*. Boston, MA: Allyn & Bacon.
- Cialdini, R.B., & Goldstein, N.J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology* 55: 591-621.
- Civic Enterprises. (2011). School counselors literature and landscape review. The College Board.
- Clinedinst, M. E. & Hawkins, D. A. (2009). State of College Admission. Washington, D.C.: National Association for College Admission Counseling.
- Cohen, G. L., & Garcia, J. (2005). I am us: Negative stereotypes as collective threats. *Journal of Personality and Social Psychology* 89: 566 –582.
- Deming, D., & Dynarski, S.M. (2009). *Into college, out of poverty? Policies to increase the postsecondary attainment of the poor.* National Bureau of Economic Research Working Paper 15387.

- Dynarski, S.M., & Scott-Clayton, J.E. (2006). The cost of complexity in federal student aid: Lessons from optimal tax theory and behavioral economics. *National Tax Journal* 59(2): 319-356.
- Giedd, J.N., Blumenthal, J., Jeffries, N.O., Castellanos, F.X., Liu, H., Zijdenbos, A., Paus, T. , Evans, C., & Rappaport, J. (1999) Brain development during childhood and adolescence: A longitudinal MRI study. *Nature Neuroscience* 2(10): 861–863.
- Gibbs, N. (2009, November 30). The growing backlash against overparenting. *Time Magazine*.
- Grodsky, E., & Jones, M. T. (2007). Real and imagined barriers to college entry: Perceptions of cost. *Social Science Research* 36(2): 745–766.
- Horn, L., Chen, X., & Chapman, C. (2003). *Getting ready to pay for college: What students and their parents know about the cost of college tuition and what they are doing to find out*. U. S. Department of Education, National Center for Education Statistics: Washington, D.C.
- Hoxby, C.M., & Turner, S. (2013). *Expanding college opportunities for high-achieving, low-income students*. Stanford University: Stanford Institute for Economic Policy Research.
- Hsueh, J., & Yoshikawa, H. (2007). Working nonstandard schedules and variable shifts in low-income families: Associations with parental psychological well-being, family functioning, and child well-being. *Developmental Psychology*, 43, 620-632.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica* 47(2): 263–291.
- Karlan, D., McConnell, M., Mullainathan, S., & Zinman, J. (2010). *Getting to the top of mind: How reminders increase saving*. National Bureau of Economic Research Working Paper No. 16,205. Cambridge, MA.
- Keating, D. P. (2004). Cognitive and brain development. In R.M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 45-84). New York: Wiley.
- Lareau, A. (2000). *Home advantage: Social class and parental intervention in elementary education* (2nd ed.). Lanham, MA: Rowman & Littlefield Publishers, Inc
- Lipka, S. (2005, December 16). Some helicopter parents play politics to protect their children’s interests. *The Chronicle of Higher Education*, 52(17): A22.
- Lenhardt, A. (2012). *Teens, smart phones, and texting*. Washington, D.C.: Pew Research Center.
- Lovelace, K., & Rosen, B. (1996). Difference in achieving person-organization fit among diverse groups of managers. *Journal of Management*, 22(5): 703-722.
- Lum, L. (2006). Handling helicopter parents. *Diverse Issues in Higher Education*, 23(20): 40-42.

- Madrian, B.C., & Shea, D.F. (2000). *The power of suggestion: Inertia in 401(K) participation and savings behavior*. National Bureau of Economic Research Working Paper No. 7,682. Cambridge, MA.
- Milkman, K.L., Beshears, J., Choi, J.J., Laibson, D., & Madrian, B.C. (2012). *Following through on good intentions: The power of planning prompts*. National Bureau of Economic Research Working Paper No. 17,995. Cambridge, MA.
- Mullainathan, S. (2011). The psychology of poverty. *Focus 28(1)*: 19 – 22.
- Murray, D.M., Luepker, R.V., Johnson, A.C., & Mittelmark, M.B. (1984). The prevention of cigarette smoking in children: A comparison of four strategies. *Journal of Applied Social Psychology 14(3)*: 274–88.
- National Center for Education Statistics. (2009). Common Core of Data. Washington, D.C.: U.S. Department of Education, Institute of Education Sciences.
- Newman, R. S. (1994). Adaptive help seeking: A strategy of self-regulated learning. In Schunk, D., and Zimmerman, B. (eds.), *Self-Regulation of Learning and Performance: Issues and Educational Applications*, Hillsdale, NJ: Lawrence Erlbaum Associates.
- Pallais, A. (2009). *Why not apply? The effect of application costs on college applications for low-income students*. Paper presented at the Annual Meeting of the American Economic Association.
- Perna, L.W. (2004). Understanding the decision to enroll in graduate school: Sex and racial/ethnic group differences. *Journal of Higher Education*, 75, 487-527.
- Presser, H.B., & Cox, A.G. (1997). The work schedules of low-educated American women and welfare reform. *Monthly Labor Review (120)4*: 25 - 34.
- Purcell, K., Heaps, A., Buchanan, J., & Friedrich, L. (2013). *How teachers are using technology at home and in their classrooms*. The Pew Center: Pew Internet and American Life Project.
- Ramey, G., & Ramey, V.A.. (2010). The rug rat race. *Brookings Paper on Economic Activity, Economic Studies Program, The Brookings Institution 41(1)*: 129-1999.
- Roderick, M., Nagaoka, J., Coca, V., Moeller, E., Roddie, K., Gilliam, J., & Patton, D. (2008). *From high school to the future: Potholes on the road to college*. Chicago, IL: Consortium on Chicago School Research.
- Rowan-Kenyon, H.T., Bell, A., & Perna, L.W. (2008) Contextual influences on parental involvement in college going: Variations by socioeconomic class. *Journal of Higher Education 79*: 564-586.
- Ryan, A.M., & Pintrich, P.R. (1997). Should I ask for help? The role of motivation and attitudes in

- adolescents' help seeking in math class. *Journal of Educational Psychology* 89: 329-341.
- Schneider, B. (2009). *College choice and adolescent development: Psychological and social implications of early admission*. Arlington, VA: National Association for College Admissions Counseling.
- Schneider, B., & Stevenson, D. (1999). *The ambitious generation: America's teenagers, motivated but directionless*. New Haven, CT: Yale University Press.
- Schwartz, B. (2004). *The paradox of choice: Why less is more*. New York: Harper Perennial.
- Scott-Clayton, J. (2011). *The shapeless river: Does a lack of structure inhibit students' progress community colleges?* CCRC Working Paper No. 25. New York: Community College Research Center, Teachers College, Columbia University.
- Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Development review* 28: 78-106.
- Steinberg, L., Cauffman, E., Woolard, J., Graham, S., & Banich, M. (2009). Are adolescents less mature than adults? Minors' access to abortion, the juvenile death penalty, and the alleged APA "Flip-Flop." *American Psychologist* 64: 583-594.
- Stockwell, M.S., Kharbanda, E.O., Martinez, R.A., Vargas, C.Y., Vawdrey, D.K., Camargo, S. (2012). Effects of a text messaging intervention on influenza vaccination in an urban, low-income pediatric and adolescent population. *Journal of the American Medical Association* 307(16): 1702-1708.
- Strauch, B. 2003. *The primal teen*. New York: Anchor Books.
- Subrahmanyam, K., & Greenfield, P. (2008). Online communications and adolescent relationships. *Future Child* 18(1): 119-146.
- Thaler, R., & Sunstein, C. (2008). *Nudge: Improving decisions about health, wealth, and happiness*, Yale University Press, New Haven, 2008
- The Institute for College Access & Success. (2013). *Aligning the means with the ends: How to improve federal student aid and improve college access and success*. Washington, D.C.: The Institute for College Access and Success.
- Walton, G.M., & Cohen, G.L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology* 92(1): 82-96.
- White, W.S. (2005, December 16). Students, parents, colleges: Drawing the lines. *The Chronicle of Higher Education*, 52(17): B16.

White, K. M., Hogg, M. A., & Terry, D. J. (2002). Improving attitude-behavior correspondence through exposure to normative support from a salient in-group. *Basic and Applied Social Psychology* (24): 91-103.

-
- ⁱ Adelman, 2006; Deming & Dynarski, 2009
 - ⁱⁱ Bettinger et al., 2012; Hoxby & Turner, 2013; Sacerdote & Carrell, 2012
 - ⁱⁱⁱ Avery & Kane, 2004; Grodsky & Jones, 2007; Horn, Chapman, & Chen, 2003
 - ^{iv} Dynarski & Scott-Clayton, 2006; Bettinger et al., 2012
 - ^v Avery & Hoxby, 2012; Bowen, Chingos, & McPherson, 2009; Roderick, Coca, & Nagaoka, 2011; Smith et al., 2012
 - ^{vi} ASCA, 2012; NCES, 2009
 - ^{vii} Clinedinst & Hawkins, 2009
 - ^{viii} Civic Enterprises, 2011
 - ^{ix} Purcell et al., 2013
 - ^x Casey, Jones, & Somerville, 2011; Steinberg, 2008; Steinberg et al., 2009
 - ^{xi} Casey et al, 2005; Giedd, et al., 1999; Strauch, 2003
 - ^{xii} Mullainathan, 2011
 - ^{xiii} Schneider, 2009
 - ^{xiv} Schneider & Stevenson, 1999
 - ^{xv} Ramey & Ramey, 2010; White, 2005
 - ^{xvi} Gibbs, 2009; Lipka, 2005; Lum, 2006
 - ^{xvii} Buchmann, Condron, & Roscigno, 2010
 - ^{xviii} Acs & Loprest, 2005; Presser & Cox, 1997
 - ^{xix} Hsueh & Yoshikawa, 2007
 - ^{xx} Perna, 2004; Heather-Rowan, Bell, & Perna, 2008
 - ^{xxi} Lareau, 2000
 - ^{xxii} Institute for College Access and Success, 2013
 - ^{xxiii} Schwartz, 2004
 - ^{xxiv} Thaler & Sunstein, 2008; Scott-Clayton, 2011
 - ^{xxv} Thaler & Sunstein, 2008
 - ^{xxvi} Chabris, Laibson & Schuldt, 2008
 - ^{xxvii} Pallais, 2009
 - ^{xxviii} Kahneman & Tversky, 1979
 - ^{xxix} Milkman et al., 2012
 - ^{xxx} Karlan et al., 2010
 - ^{xxxi} Karlan et al., 2010; Stockwell et al., 2012
 - ^{xxxii} Mullainathan, 2011
 - ^{xxxiii} Milkman et al., 2012
 - ^{xxxiv} Madrian & Shea, 2000
 - ^{xxxv} Beshears et al., 2012
 - ^{xxxvi} Lenhardt, 2012
 - ^{xxxvii} Boldero & Fallon, 1995; Newman, 1994; Ryan & Pintrich, 1997
 - ^{xxxviii} Castleman & Page, 2013; Subrahmanyam & Greenfield, 2008

- xxxix Cialdini & Goldstein, 2004
- xl Cialdini, 2001
- xli Murray et al, 1984; White, Hogg, & Terry, 2002
- xlii Walton & Cohen, 2007
- xliii Cohen & Garcia, 2005
- xliv Lovelace & Rosen, 1996
- xlv Kahneman & Tversky, 1979
- xlvi Baum, Ma, & Payea, 2010.
- xlvii Camerer et al., 1997
- xlviii Berman, Ortiz, & Bos, 2008
- xlix Carrell & Sacerdote, 2012
- ¹ Arnold et al., 2009; Castleman, Arnold, & Wartman, 2012; Castleman & Page, 2013; Castleman, Page, & Schooley, 2012.
- ^{li} Castleman & Page, 2013
- ^{lii} Castleman, Arnold, & Wartman, 2012; Castleman, Page, & Schooley, 2012
- ^{liii} Bettinger et al., 2012
- ^{liv} Hoxby & Turner, 2013
- ^{lv} Castleman & Page, 2013
- ^{lvi} Thaler & Sunstein, 2008
- ^{lvii} Bond et al., 2012