Behavioral Economics and the Democratization of Education: Exploring Heuristics and Biases to Increase Economic Diversity at Top Universities in the United States.

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Abstract

Despite affordability, many high-achieving students coming from disadvantaged backgrounds do not apply to the most competitive universities in the United States. Minding the democratizing power of high-quality education, such a phenomenon only allows inequality to perpetuate from a generation to another. This paper explores the ways in which five heuristics and biases can affect a low-income student's reluctance to seek admission to the country's best schools. Splitting the decision-making process into three stages, I argue that: (1) underconfidence and availability impact the prediction of admission chances, (2) framing triggers an anchoring effect influencing the assessment of attendance feasibility, and (3) representativeness sways the estimation of post-enrollment success. To mitigate these errors in judgment, the policies I propose consist of course simulation programs, engaging same-background university students in school talks, a reversed advertisement of costs, and a matching system for campus visits based on socioeconomic background.

1 Introduction

Why do many low-income, high-achieving students choose not to apply to the best universities in the United States? Is such a choice important? Is it rational? If not, where does it stem from and what can be done about it? This paper answers the questions above using previous research and data, deductive reasoning, and concepts in behavioral economics.

The value of high-quality higher education is set forth in Section 2. After linking this value to the prospect of breaking cycles of poverty, I explore studies and statistics showing that many top-performing students coming from disadvantaged backgrounds fail to take advantage of such prospect. Attempts to

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explain this phenomenon assuming rational decision-making are further rebutted, leading to the conclusion that the problem can be analyzed through a lens of behavioral economics - a discipline presuming that humans do not always think rationally. Succeeding the explanation of key notions in behavioral economics, to investigate a low-income student's reluctance to apply to top schools, Section 3, 4, and 5 each focus on one or two heuristics or biases (defined in Section 2.1) and their connection to a stage of thinking in college choice.

Underconfidence (defined in Section 3.1) and availability (defined in Section 3.3) are the heuristics analyzed in Section 3 as the reasons why many low-income students fail to believe in their chances to be admitted. The mechanism of underconfidence is explained using both deductive reasoning and data and is followed by the proposal of a potential solution to eliminate the bias, based on both suppositions and a previously effective program. Availability is approached in the same manner, yet the policy proposals consist of both eliminating the bias through awareness and nudging it through school talks.

Section 4 explains how the framing effect generates an anchoring effect (both defined in Section 4.1) leading disadvantaged students to believe that top colleges are more expensive than they truly are. Comparing the advertisement of college costs in the United States with the one in an European country, I propose nudging the bias by reversing the anchor.

The next stage after attendance feasibility, namely success during and after college, is the focus of Section 5, which explains how representativeness can determine a low-income senior to assume that, despite data showing otherwise, this success cannot exist. Based on deduction, I further propose that universities can mitigate the problem by nudging representativeness during campus visits.

1.1 Clarifications

This study focuses exclusively on United States citizens or permanent residents, as admission criteria and financial support eligibility often differ for international students. The terms "low-income", "disadvantaged", "underprivileged" or "underserved" refer to students coming from the bottom quartile of family income in the United States, while "privileged", "wealthy", or "high-income" refer to the upper quartile. Students are considered "high-achieving", "stellar", "top", or "qualified" if their grades and test scores are in the top ten percent nationwide. Unless specified otherwise, this paper names a university "selective", "competitive", "prestigious", "top", or "elite" if it is categorized as "most competitive" or "highly competitive" by Barron's Profile of American Colleges, 29th Edition.

2 Context

High-quality higher education can act as a prodigious equalizer in society. Inasmuch as studies show that a university's caliber greatly impacts the future goals, careers, and earnings of its graduates (Carey, 2019), enrolling in a competitive

institution can pave a low-income student's path towards economic advancement (Aisch, Buchanan, Cox & Quealy, 2017). Although competitive colleges in the United States are often costly, diversity-oriented policies and generous financial aid packages make it possible for American students coming from disadvantaged backgrounds to attend. There are 105 prestigious American universities that do not take a student's ability to pay into account when deciding upon admission. Of the 25 highest-ranked universities, 23 commit to meeting one hundred percent of an admitted student's financial need, many of them involving no loans (U.S News & World Report, 2021). Yet plenty of qualified seniors coming from underserved communities do not grant themselves the opportunity to receive these universities' admission letters and review their offers of financial assistance.

Karen, a student coming from a low socioeconomic background, was interviewed by Alexandria Walton Radford as part of a study analyzing 900 American public high school valedictorians. With the highest grades in her class, 99th percentile nationwide test scores, and massive extracurricular involvement as the leader of many academic teams, she was an undoubtedly stellar student. Simultaneously, she played in a band, worked as a part-time assistant for the elderly, and held a seasonal job in agriculture to compensate for her family's tight budget. Her accomplishments and background would've determined many elite universities to accept her, while her parents' income would've granted her zero-cost attendance. Yet this student enrolled in a local, less competitive college providing her with fewer resources at higher costs (Walton Radford, 2013).

Karen's case is not a rare occurrence. There were approximately 35,000 low-income, high-achieving twelfth graders in American high schools in 2008. Yet more than 80 percent of them did not apply to any competitive university. Additionally, the few who applied originated disproportionately from urban areas, attending selective or "magnet" secondary schools in the company of many accomplished, top degree-seeking peers (Blumenstyk, 2014). Similarly, in Radford's study, only 50 percent of the valedictorians coming from low-income families applied to at least one of the country's 61 most selective colleges as ranked by the U.S News and World Report. By contrast, approximately 80 percent of their upper-middle or upper-class counterparts tried to gain admission to one of these schools. Such a discrepancy occurred despite data showing both categories were just as likely to be admitted, owing to the wish of prestigious universities to increase socioeconomic diversity yet preserve a qualified student body (Hoxby & Avery, 2013). Due to plentiful financial aid, these students were also just as likely to enroll. The financial aid packages top schools provide generally involve fewer costs than the ones proposed by the 2-year or in-state 4-year alternatives low-income students often prefer (Walton Radford, 2013).

With equal odds to receive positive answers and attend as their wealthier counterparts, one may suspect that the reason why disadvantaged students are reluctant to submit their applications to prestigious schools revolves around discrepancies in college life or graduation rates. However, research encompassing students from both privileged and underprivileged financial backgrounds, with similar academic achievements, shows no difference in their journeys towards

obtaining a degree (Hoxby & Avery, 2013). It thus becomes clearer and clearer that there is no rational reasoning that satisfactorily explains the decisions of so many high-achieving, low-income students not to seek admission to the country's best undergraduate institutions. Such an issue is therefore worth exploring through the lens of a realm that assumes one's inevitable flaws in judgment.

2.1 Heuristics and Biases

The standard economic theory relies on the premise that humans make decisions that maximize individual satisfaction. It assumes people's ability to effectively weigh the costs and benefits of the variables available to them without being influenced by external or emotional factors. On the flip side, behavioral economics is based on the concept of bounded rationality, assuming that individuals are often incapable of making the best decisions. It draws on both economics and psychology to investigate why choices do not always follow standard economic models (Kahneman & Tversky, 1979). The mechanisms provoking this irrational behavior that behavioral economists investigate are called heuristics, or mental shortcuts the brain employs to shorten time and minimize effort in decision-making. Although useful in a plenitude of situations, heuristics can sometimes lead to subconscious, systematic thinking errors known as cognitive biases (Kahneman, 2011).

This paper looks at underconfidence, availability, the anchoring effect triggered by framing, and representativeness as heuristics and biases that affect the unwillingness of a high-achieving, low-income student to apply to the most selective universities in the United States. Assuming that one desires to attend college with the aim of graduation, it is reasonable to infer that one progressively considers the three main prerequisites of graduation when determining whether to apply: to be admitted, to enroll, and to perform well. Consequently, I split the decision-making process into three steps: the prediction of admission chances, the assessment of attendance feasibility, and the estimation of post-enrollment success. Further, I associate one, respectively two heuristics or biases with each step of the process. After the explanation of the context and mechanism of each error in judgment, I propose possible policies universities can adopt to mitigate these errors, and thus increase the representation of the lower socioeconomic class among their applicants.

3 Underconfidence, Availability & Predicting Admission Chances

3.1 The Context and Mechanism of Underconfidence

The sheer acknowledgment that elite universities only admit a small percentage of their applicants embeds a degree of uncertainty in students' minds when thinking about acceptance to these universities. Such uncertainty invariably leads to predictions of chances, which further lead to students assessing the way

in which these institutions may perceive their applications. It is fair to suppose that this assessment is first reliant on how one perceives oneself.

Underconfidence is defined as "a cognitive bias characterized by an underestimation of one's ability to perform a task successfully or by an underrating of one's performance relative to that of others" (APA Dictionary of Psychology). With admission replacing the "task" in the context of college applications, if affected by underconfidence, students are likely to underestimate the strength of their candidacies and further fail to believe in their chances to get accepted. Students coming from underserved backgrounds are predominantly impacted by this bias, for there are various studies linking child poverty with underconfidence (Filippin & Paccagnella, 2011). Though little is known as to the mechanism of this association, literature shows the following causality: child poverty can bring about poor parental involvement (Evans, 2004), which leads to low self-esteem (Parker & Benson, 2004).

3.2 Policy Proposals to Overcome Underconfidence

Tracking a logically reversed path, a possible way for elite universities to mitigate the applications lost due to students underestimating their abilities would consist of programs meant to persuade them of the existence of these abilities. Since the difficult nature of top colleges' courses is ubiquitously either known or assumed, the acknowledgment of intellectual worth can stem from the successful completion of such a course. The potential efficiency of this solution extends beyond sole deductive reasoning. An initiative called "The Equity Lab" enrolled over 300 juniors and seniors from underprivileged American high schools in a Harvard course, with equally rigorous standards as the one attended by the university's actual students. Its purpose revolved around "giving students confidence and preparing them for the rigors of competitive colleges." Of the participants completing the course in fall 2019, nearly 90 percent passed (Green, 2021). The post-program statements of some students confirm its efficiency in boosting their faith in their abilities. Currently a freshman at Columbia University, Di'Zhon Chase declared: "I had the dreams, the aspirations, but there was no 'I can really do that — go to these places where all these people do so many amazing things.' But I can do this."

Although programs such as "The Equity Lab" prove to be efficient confidence catalysts and are perpetually expanding (it now encompasses 1,500 students from 75 of the nation's most disadvantaged schools in 35 cities) (Green, 2021), their impact can be maximized by designing them for even younger students. In a meta-analysis encompassing 446 studies, the effect of low self-esteem among children from underserved communities was proven to appear very early and rise considerably with age (Twenge & Campbell, 2002). Consequently, to not only decrease but minimize underconfidence in low-income seniors, actions should be taken more promptly, prior to students' last two years of secondary school.

3.3 The Context and Mechanism of Availability

Whilst chance predictions are firstly based on self-worth assessments, the natural next step to predict how universities perceive this worth is thinking about their previous perceptions. Most times, the knowledge seniors from underserved communities possess about the most competitive universities in the United States is either self-searched or received through informative emails. School counselors rarely offer them personalized guidance, and their conversations and encouragements are generally centered on local, in-state colleges. The study analyzing 900 valedictorians reports that low-income students endeavor to arrange individual meetings with their counselors, yet in such meetings they are not presented with college options matching their outstanding achievements. If these students turn to their families, there are high chances that nobody has attended college (Walton Radford, 2013). As a result, their perceptions of elite universities rely on rather impersonal information. By contrast, the personal stories these students have the most contact with are their older peers attending local, less competitive in-state or community colleges.

As defined by D. Kahneman, the availability heuristic is the "process of judging frequency by the ease with which instances come to mind" (Kahneman, 2011). Availability explains that humans are tempted to deem the examples that come readily to their minds as more representative than they truly are. Because vivid examples that one has had personal contact with come easier to mind than statistical information (Smith, 1988), students are more likely to assess the frequency of low-income undergraduates at elite universities based on their peers' stories rather than the numbers they read about. This leads to them believing there are fewer success stories than there are. Inasmuch as it is reasonable to assume that an assessment of such frequency is embedded in one's prediction of chances, and thus one's decision to apply, availability can explain why some high-achieving, low-income students do not seek admission to the country's top colleges. Though low-income students' admissions exist in numbers, the lack of direct experience with such stories makes underprivileged high schoolers underestimate their frequency, and consequently underestimate their own chances to get accepted (Jaschik, 2012).

3.4 Policy Proposals to Overcome Availability

Since research shows that awareness regarding availability contributes to its reduction (Tversky & Kahneman, 1974) a potential solution consists of informing students of this heuristic. Universities can thus craft campaigns mooting the existence of availability and its mechanism as it relates to college choice.

3.5 Policy Proposals to Nudge Availability

Besides attempting to diminish the bias, universities can also benefit from modeling the heuristic the other way around. The humanization of statistics can mitigate one's faulty estimation of admission chances. Individual cases, due

to their intrinsic concreteness and thus vividness, are particularly overused in assessments whilst compendiums are often overlooked. This idea is illustrated by the story of a college professor whose presentation of compelling statistics in class lost relevance due to a student's single different example (Hogarth, 1987). Analogically, programs in which currently-enrolled students coming from low socioeconomic backgrounds return to their schools and share their admission stories can determine the possibility of acceptance to become more salient in the mind of a low-income younger student.

4 Framing, The Anchoring Effect & Assessing the Feasibility of Attendance

4.1 The Context and Mechanisms of Framing and Anchoring

Assuming that high-achieving, underprivileged students cease believing they cannot gain admission into top colleges, there are still other concerns to be taken into account before submitting an application. With elite institutions having pricey tuition costs, one naturally attempts to estimate affordability. Yale University, one of the country's highest-ranked institutions, showcases an $81,575 estimated cost of attendance on its website. When it comes to financial assistance, the university claims that "financial aid policies ensure that 100% of every student's demonstrated need is met with a package that does not include loans" (Yale University, 2021). Seeing that Yale promises to make itself affordable for students regardless of financial background, one may wonder why many low-income students still believe they cannot manage the costs. Framing and anchoring can provide an explanation.

When humans focus on the manner in which information is presented rather than the information itself, a framing effect occurs (APA Dictionary of Psychology). Framing influences human behavior for it causes different descriptions of the same decision to generate different preferences, but it can also trigger other heuristics. In a numerical context, framing becomes a gateway to the anchoring effect, which explains that humans tend to make estimates based on an initial value that they adjust to yield a final answer, with adjustments being insufficient to compensate for the bias toward this initial value. (Tversky & Kahneman, 1974). Revisiting Yale's example, which is representative of many selective institutions, the frame put forward by the university is the cost of attendance amounting to $81,575, a sum of money that becomes the anchor. The college further presents that, depending on a student's economic background, the cost can either be reduced or disappear through financial aid. However, heeding the anchoring effect, low-income students and their families are unable to fully adjust to coming to believe they can pay nothing. With the cost of attendance continuing to be high in their minds, they deem attendance unfeasible.

4.2 Policy Proposals to Nudge Framing and Anchoring

Following the same logic, a possible way to persuade low-income students of their affordability would be for colleges committing to meet one hundred percent of a student's need to frame education with a free anchor. The first piece of information students would heavily rely upon would be a non-existent cost, thus eliminating the peril of insufficient downwards adjustment. The whole process would be reversed: attendance is free, yet depending on the family's income, students could end up paying the big sum of money acting as an anchor in the status quo.

Such a measure would also act as a shield against the shortage of awareness surrounding financial aid possibilities. While some families acknowledge the existence of financial aid but subconsciously diminish its potential magnitude, other families either do not know about it or find its mechanism too difficult to grasp. Throughout a study conducted by the National College Attainment Network (NCAN) on 150 low-income students, half of them applied for financial aid and half did not. Out of the ones who did not, more than 50 percent declared non-existent knowledge about financial aid (Morgan, 2016). Beginning their cost presentations from zero would quell knowledge or understanding of financial assistance as a prerequisite for believing in the feasibility of attendance.

The efficiency of a zero-cost anchor for higher education is also suggested by universities in other countries. In Sweden, for instance, college is advertised as free. The tuition is indeed free, yet there are plenty of other costs implied in attendance, such as meals or accommodation (Phillips, 2013). The Social Mobility Index in Sweden is the 4th highest in the world, while the United States occupies the 27th place. Even if high-quality universities don't play the sole role in social mobility, higher education is a significant catalyst behind this climb (Haveman & Smeeding, 2006). Though presumptive, the high social mobility index can be caused by an increase in the number of low-income applicants at Swedish universities, which can be reasonably influenced by the free-cost anchor.

5 Representativeness & The Estimation of Post-Enrollment Success

5.1 The Context and Mechanism of Representativeness

Returning to the paper's premise that students wish to graduate from the universities they choose to attend and are aware of this desire when deciding where to apply, the submission of an application also relies on the extent to which seniors believe their experience will culminate in a diploma. Comparing elite universities with the less competitive ones that high-achieving, low-income students often prefer to enroll in, data shows a negative correlation between acceptance and graduation rates (Light & Strayer, 2000). Accordingly, top-ranked universities should be more desirable than less competitive schools when students predict the likelihood of completion. Furthermore, studies show no signif-

icant divergence in the paths of low-income and high-income students towards attaining a degree at competitive universities (Blumenstyk, 2014). Yet representativeness can easily determine a student from a disadvantaged background to subconsciously dismiss these statistics.

Representativeness occurs when "we judge the probability that an object or event A belongs to class B by looking at the degree to which A resembles B" (Kahneman & Tversky, 1972). When humans do this, they ignore information about the general probability of B's occurrence. In the context of college choice, evaluations of representativeness consist of judging similarity between oneself and the typical student at a certain institution. Seniors tend to have a student prototype for a specific university in mind and further attempt to assess the degree to which they resemble this person. An assessment of either similarity or dissimilarity then determines students to deduce that their potential to succeed at that school is either high or low (Smith, 1988).

At the highest-ranked institutions, amounting to a small percentage of undergraduates, low-income students are not the prototype. In view of low acceptance rates and massive enrollment of high-income students, it is fair to infer that a typical student's conspicuous attributes would revolve around intellectual ability and affluence. Considering representativeness, low-income students will try to draw connections between this typical student's attributes and their own. While it is clear that similarity cannot spring from the assessment of wealth, revisiting the previous points about underconfidence, students originating from underserved communities are not likely to judge their levels of capability as similar to the one of the prototype either. As a consequence, many high school students with low socioeconomic backgrounds do not believe that they can be successful at the most competitive American universities.

5.2 Policy Proposals to Nudge Representativeness

To be able to take post-enrollment success at top universities into account, low-income students need to sense similarities between them and successful graduates. Since these students often underestimate their abilities, fostering the links of similarity has to rely on rather factual attributes. In this regard, an objective aspect would be one's socioeconomic background. If universities put high school students in contact with graduates coming from families of comparable income and social environment, these students can start identifying the potential to succeed in their own paths.

A potentially beneficial idea would be for programs connecting low-income prospective and successful past students to take place while students visit campuses. Based on each college's policies, when signing up for or arriving at a tour, high school students would undergo this matching procedure with a graduate (or, depending on availability, a high-performing, extremely likely to graduate junior or senior). Such a setting would also take advantage of humans' natural tendency to assess an event's likelihood based on the ease with which it can be mentally crafted (Oxford Reference). Furthermore, to maximize the impact of the matching system, matching could be made by also considering one's gen-

der and major (e.g. female seniors wanting to pursue a STEM major matched with female graduates or students with a STEM major). As a consequence, low-income students will be increasingly able to picture their journeys at top universities.

6 Conclusion

The most competitive universities in the United States need to enact efficient policies to foster applications coming from low-income students and therefore increase economic diversity. As the unwillingness of many underserved students to apply does not fall under the standard economic framework assuming the rationality of human decision, this paper proves that colleges would benefit from either eliminating or nudging some of the heuristics and biases these students possess. Relying on the premise that decision-making in college choice follows a prospective, chronological thinking mechanism encompassing assessments of chance, feasibility, and success, this study shows the manners in which underconfidence, availability, framing, anchoring, and representativeness affect this process. Solutions are proposed for each, yet, due to this paper's non-experimental research methods, they need testing to be proven efficient. Universities are likely to mitigate underconfidence by offering underprivileged students the opportunity to see themselves succeed at simulations of their difficult courses. The other heuristic affecting the belief in the possibility of admission, availability, can be both minimized through awareness and nudged through the spread of low-income students' success stories in the form of school talks. As to the feasibility of attendance, by framing their costs in a reversed manner starting from free tuition, universities can establish a novel reference point for students and thus determine them to fully grasp their affordability. Once students believe in both their chances to be admitted and the possibility to go, the salience of post-enrollment success in their minds, influenced by judgments of representativeness, can be facilitated by same-background campus tour systems.

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