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# A Nudge Towards Excellence: The Application of Behavioral Economics in Education Policy

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**A Nudge Towards Excellence**

*The Application of Behavioral Economics in Education Policy*

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## **Abstract**

The purpose of this paper is to analyze the potential for the application of behavioral economics to the field of education policy through “nudges.” Given the difficulty of passing effective comprehensive education reform legislation, the application of nudges represents a low-cost, high-impact approach to improve student outcomes. This paper offers definitions of several key concepts in the fields of behavioral economics and education: education reform, behavioral economics, choice architecture, nudges, and why behavioral economics is particularly relevant to education reform. Also, the paper describes past education reform attempts, including two that incorporated behavioral economics and two that did not, and evaluates their effectiveness. Finally, the paper offers nudge recommendations for students, parents, and teachers.

## Introduction

The failures of the American education system are well documented. Despite one of the highest levels of education spending per student in the world, we are falling further behind in education rankings (OECD, 2016). Once the best in the world, we now rank 36<sup>th</sup> in mathematics, 23<sup>rd</sup> in reading, and 28<sup>th</sup> in science (OECD, 2014). Students, parents, teachers, administrators, researchers, and politicians on both sides of the aisle largely agree that major changes are necessary. However, comprehensive education reform is complicated and costly. After decades of reform attempts, progress has been limited. However, with each failure, another generation of students is left behind. We cannot afford to wait to fix our schools; there are children's futures at stake.

Fortunately for policymakers, there is an emerging field that offers vast opportunities for low-cost, high-impact interventions that can significantly improve education outcomes. This field is known as behavioral economics and the interventions that will be described in this paper are known as nudges. These concepts will be described in greater depth in the first section of this paper. Essentially, nudges can serve as the policy tools that will allow us to pick the low-hanging fruit that exists in our education system today. By taking advantage of these reforms, we can boost attendance, improve GPAs, raise test scores, increase the likelihood of students graduating and going to college, close achievement gaps, and better prepare the next generation of young people for successful careers.

This paper will be divided into three sections. Section I will provide a brief background with explanations of the key components of the paper, including education reform, behavioral economics, choice architecture, nudges, and why behavioral

economics is particularly relevant to education reform. In Section II, I will analyze several education reform attempts in the United States since World War II. Specifically, I will look for reform attempts that influenced choice architecture and reform attempts that did not, and evaluate the effectiveness of such reforms through a behavioral economics lens. Finally, in Section III, I will offer a list of recommendations of nudges that can be used in the education system today to improve student outcomes. I will divide this section into nudges for students, nudges for parents, and nudges for teachers.

### Section I: Background Information

In this paper, I will be discussing past education reform attempts. I will only be examining reform efforts made in the post-World War II era. The narrowed focus reflects two purposes: first, the field is quite broad and it would be difficult to provide sufficient depth on any particular issue if centuries worth of education reform efforts were being considered. Furthermore, and more significantly, the changes that have been made in the latter half of the 20<sup>th</sup> century and beginning of the 21<sup>st</sup> century define the current education landscape in which our schools operate today.

Since World War II, the American education system has undergone major changes from within and without. According to former U.S. Assistant Secretary of Education Chester Finn, Jr., our schools have “changed far more from without, as a more demanding...society and quickening international economy placed new stresses on them and as parents, community leaders, public officials, philanthropists, and innumerable experts and blue-ribbon panels sought to reshape them. They also bear the imprint of

shifting demographics and wider cultural and technological developments” (Finn, 2008, p. ix). The nature of these changes will be described in greater depth in Section II, but it is clear that significant shifts have occurred that have fundamentally altered the ways in which students are taught, teachers are evaluated, parents are involved, schools are ranked, and systemic decisions are made.

The next important term to define is behavioral economics. This field is relatively new, emerging in the past 50 years, and incorporates elements of psychology, neuroscience, and sociology (Lavecchia, Liu, & Oreopoulos, 2014, p. 4). Essentially, behavioral economics is a response to the real-world context in which actors in traditional theoretical economic models make decisions. In traditional economics, all actors are considered rational, meaning that they weigh the benefits and costs of every decision and select options in which benefits outweigh costs, considering both the short-run and the long-run. While useful for building models, this process does not describe the way in which people make all of their decisions in their daily lives. Thus, two of the leading researchers in the field, Richard Thaler and Cass Sunstein, distinguish between “Econs” and “Humans” (Thaler & Sunstein, *Nudge: Improving Decisions About Health, Wealth, and Happiness*, 2009, p. 21). Econs represent actors in a traditional economic model, in which all decisions reflect a careful calculation of costs and benefits. Humans represent the rest of us, who frequently make decisions based on a variety of other factors, sometimes resulting in suboptimal decisions. The purpose of the field of behavioral economics is to “better understand individual decision making and to develop policies that address the shortcomings in our decision-making processes” (Lavecchia, Liu, & Oreopoulos, 2014, p. 4). Behavioral economics, therefore, is not a rejection of traditional

economics, but rather supplementary to the field, with significant potential for policy application.

The policy application potential of behavioral economics comes in the form of what Thaler and Sunstein label as “nudges.” A nudge is an intervention that influences people’s behavior towards certain predictable outcomes without restricting or mandating any options, or significantly altering costs (Lavecchia, Liu, & Oreopoulos, 2014, p. 17; Thaler & Sunstein, *Nudge: Improving Decisions About Health, Wealth, and Happiness*, 2009, p. 6). A useful example of this is to consider the experience of selecting among food options in a school cafeteria. If policymakers decided that they wanted to encourage healthy eating by banning junk food, this mandate would not qualify as a nudge because it restricts choice. Similarly, requiring students to eat fruit instead of cookies would not qualify as a nudge since it mandates a particular behavior. It also would not be a nudge if you offered students \$500 to eat vegetables instead of cookies; indeed, they still have the same set of options, but the cost structures have clearly been changed significantly. However, if the easily-accessible candy bars in the checkout line were moved to the back and replaced by apples, this would qualify as a nudge (Thaler & Sunstein, *Nudge: Improving Decisions About Health, Wealth, and Happiness*, 2009, p. 6). Nudges, fundamentally, seek to help people make better decisions for themselves and society without mandating or eliminating specific options, or drastically changing economic incentives. One way in which I will be discussing nudges is in the context of “choice architecture.”

Choice architecture is “the design of the environment in which people make choices” (Madrian, 2014, p. 19). In Section II, I will describe how past education reform

attempts altered the choice architecture of actors within the education system. Essentially, I will be referring to the framework in which decisions were made about our schools, our styles of learning, and our mechanisms for improving student outcomes. There are a variety of choice architecture tools that have been inspired by behavioral economics, ranging from changing defaults to reducing the number of options in a choice set (Madrian, 2014, p. 19). Research has shown that tools like these have the potential to create better outcomes across a range of areas in government and society, including health care, energy, and job creation (The Behavioural Insights Team, 2016, p. 3).

However, there are important reasons why I chose to focus on behavioral economics in education specifically. One of the key concepts of behavioral economics is “discounting,” which essentially means that consumption is worth more to people now than later (Thaler, *Misbehaving: The Making of Behavioral Economics*, 2015, p. 89). In other words, people are present-biased. This is especially true of young people. The famous study demonstrating this concept comes from Stanford researcher Walter Mischel and involved four- to five-year-old children being offered one Oreo cookie immediately or three when the experimenter came back into the room. Many students took one cookie immediately, although those who waited ended up with greater career success decades later (Thaler, *Misbehaving: The Making of Behavioral Economics*, 2015, pp. 100-101).

To succeed in school, students must be able to embrace delayed gratification. As Aristotle said more than 2000 years ago, “The roots of education are bitter, but the fruit is sweet” (Lavecchia, Liu, & Oreopoulos, 2014, p. 2). Students must complete homework assignments, study for tests, write papers, complete projects, and plan work schedules in order to achieve high GPAs and standardized test scores. Then, they must do it all over

again in college, and perhaps further in graduate school, in hopes of attaining a quality job. The amount of work represents a massive upfront investment, with a payoff that for some is too far on the horizon to be worth pursuing. In other words, “in order to experience the long run returns to schooling, students must make sustained investments in human capital that require exerting effort on tasks that often have relatively low returns in the near term” (Levitt, List, Neckermann, & Sadoff, 2012, p. 2).

This is where nudging come in. The field of behavioral economics has revealed a myriad of interventions that address specific impediments to education achievement. By understanding how students think and what drives their behavior, we can design policy that is less costly and more effective (Madrian, 2014, p. 3). While that is true for many fields, it particularly applies to education, where the choice architecture in which students decide whether they should study, pay attention in class, and do their homework is currently tilted in a suboptimal direction. Through nudges for students, and other actors in the education system, we can significantly improve outcomes.

The final term that should be addressed is “school choice.” An understandable misconception in the study of behavioral economics and education is the idea that school choice is a nudge. School choice systems have become increasingly popular in the past 20-30 years, allowing parents to “enroll their children in a public school other than the school they would have been assigned to based on their residence area” (Kesten, 2010, p. 1297). While it might seem that offering multiple school options could be an example of influencing choice architecture, school choice does not qualify as a nudge or serve as an illustration of behavioral economics at work. Instead of influencing people to select a certain option, school choice simply increases the number of options. Returning to the

cafeteria example, school choice would be the equivalent of adding more shelves with new foods. Students would have more options – perhaps better options – but they are not necessarily any more likely to choose a banana instead of a bag of chips.

Nevertheless, school choice is a field within the education system that is ripe for interventions inspired by behavioral insights. Currently, many school districts that offer school choice provide parents with an abundance of options. Contrary to the intuitive assumption that more choices would be beneficial, researchers in the field of behavioral economics have found that when presented with too many choices, parents become overwhelmed by the information overload and often fail to make optimal decisions. Oftentimes, by reducing and simplifying options, people are led to make better decisions. Hastings & Weinstein studied the Charlotte-Mecklenberg school district, which implemented a school choice program in 2002 and originally offered parents more than 100 pages of information on the options for their children. Then, the district distilled the information packet to three pages of hard data and tools to facilitate comparisons between the schools. After the change, more parents began participating in the program and chose better-performing schools (Madrian, 2014, p. 17).

The school choice example is one illustration of the types of interventions that the field of behavioral economics is inspiring in the education system today. Other nudges described in Section III of this paper have the potential to improve student outcomes at a low cost. First, however, I will dedicate a section of the paper to analyzing education reform efforts that have been made in the United States since World War II. Although these reforms were not explicitly linked to behavioral economics, some clearly involve the influencing of choice architecture. Among such reforms, I will discuss the extent to

which the programs realized their stated goals. I will also look at reforms that did not alter choice architecture and evaluate their effectiveness.

## Section II: Past Education Reform Efforts

The following analysis of past education reform efforts is not an exhaustive list. Instead, it will provide one example in each of four sections: first, a reform effort that influenced choice architecture and was successful: Race to the Top. Second, a reform effort that influenced choice architecture but was unsuccessful: a New York City conditional cash transfer program. Third, a reform effort that did not influence choice architecture but was successful: the Better Schools Program in Tennessee. Finally, a reform effort that did not influence choice architecture and was unsuccessful: No Child Left Behind.

First, I will describe the Race to the Top (RTTT) initiative, which has altered the choice architecture of state governments and has been effective in achieving its goals. RTTT, which began in 2009 shortly after President Obama took office, was a competitive grant program for states to receive education funding. According to Mead, the unique feature of RTTT is that it was the first instance in history of the U.S. Department of Education distributing a large amount of federal education funds based on the fulfillment of criteria instead of need-based formulas (McGuinn, 2016, p. 396). In order to access RTTT funds, states competed with one another and received grants only if they adopted reforms that aligned with the Obama Administration's federal goals and approaches, which were "extremely prescriptive" (McGuinn, 2016, p. 396).

The specific reforms pushed for by the Department of Education, led by Secretary Arne Duncan, were not nudges. Instead, they were policies that aligned with the Department's four main goals: "improving teacher training, evaluation and retention policies; the development of common standards and assessments; developing better data systems; and the adoption of certain school turnaround strategies" (McGuinn, 2016, p. 396). However, the nudge from RTTT was for state governments. When governors and state assemblies were crafting education policy in the past, they had less incentive to align with federal goals. They knew that their funding would only be determined by independent factors like income and English-language proficiency. However, in the face of RTTT, state governments knew that if they enacted certain reforms, they could unlock additional funds for their education systems. This appeal drove 46 states to apply for the RTTT competition (McGuinn, 2016, p. 397).

It is important to note why the RTTT funding for states is a nudge and not a bribe. First, the program was very selective. For example, in the first round, 41 states applied and only two won funding (U.S. Department of Education, 2010, p. 1). Therefore, states entered the competition recognizing that their probability of being selected as a recipient of funds was very low. However, they still chose to make the prescribed reforms, showing how RTTT influenced behavior. Furthermore, even for states that were selected as grantees, the funds that they received represented small portions of their overall budgets, and even their education budgets. For example, Kentucky was selected in the third round of the competition and received an award of \$17 million (U.S. Department of Education, 2015, p. 3). This represents less than one-tenth of 1% of Kentucky's spending

on education overall in that fiscal year, 2011 (Office of State Budget Director for the Commonwealth of Kentucky, 2012). With the low probability of winning, and the small size of prizes for winners, the RTTT program's financial incentives represented nudges, not bribes.

Even so, in their application processes, states made significant steps towards developing the types of education systems that the Obama Administration envisioned:

“In the most in-depth analysis of the impact of RTTT conducted to date, William Howell (2015: 62) found that in the wake of the competition (2009–2014) states on average enacted 68 percent of the ‘reform policies’ it encouraged while they averaged only a 10 percent adoption rate in the seven years before the competition (2001–2008). Howell concludes that ‘(the) surge of post-2009 policy activity constitutes a major accomplishment for the Obama administration. With a relatively small amount of money, little formal constitutional authority in education, and without the power to unilaterally impose his will on state governments, President Obama managed to jump-start policy processes that had languished for years in state governments across the country’” (McGuinn, 2016, pp. 398-399).

The cost of the RTTT program, which received 100% of its funding in 2009, amounted to just over one-tenth of 1% of the annual budget and less than 1% of total education spending in the United States (United States Government Publishing Office, 2011, p. 146; U.S. Department of Education, 2015, p. 1). For a low cost, and without

mandating the enactment of any policies or restricting any options, RTTT was able to catalyze significant reforms of the U.S. education system. At the heart of the RTTT philosophy was the idea of, “shifting from sanctions (sticks) to incentives (carrots) as a way of motivating state reform” (McGuinn, 2012, p. 141). Through the use of competitive grants, the Department of Education acted as choice architects, leading state governments to create more accountable education systems. Although it is too soon to fully evaluate the implications for student achievement, RTTT was successful in realizing the education reform goals that it set out to achieve. It did so, even without acknowledging it, by instituting a behavioral incentive structure.

However, the next reform effort that I will describe also qualifies as a nudge, yet was not successful. There are quite a few instances of governments implementing conditional cash transfer programs to incentivize students to attend school, achieve better grades, improve test scores, and a host of other positive outcomes. These initiatives have a mixed record. One specific program, Opportunity NYC-Family Rewards, proved to be a failure. There is research that suggests that conditional cash transfer programs can be effective within the education system. Details on such programs will be provided in Section III.

However, Opportunity NYC-Family Rewards was not one of the successful initiatives. The program was launched as a pilot in New York City in 2007, with significant funding from then-Mayor Michael Bloomberg and his Bloomberg Philanthropies organization (Riccio, Dechausay, Miller, Nuñez, Verma, & Yang, 2013, pp. ii-iii). The program ran for three years as a general antipoverty initiative. Education was not its sole focus, as some funds were accessible based on a family’s preventive

health-care actions and parents' employment. It is a rare example of a significant large-scale reform effort that was run as an experiment (made possible by private donations). Approximately 4,800 families were involved, half of whom could receive the cash awards for fulfilling the requirements of the program. The other half were assigned to a control group that could not receive any cash awards. On average, the families in the treatment group received \$8,700 over the three years that the program ran (Riccio, Dechausay, Miller, Nuñez, Verma, & Yang, 2013, p. iii).

The specific activities within education for which families could receive payments included attendance, proficiency-level scoring on standardized tests, taking specific exams, earning minimum levels of credits, passing exams, graduating high school, having a library card, and attending parent-teacher conferences (Riccio, Dechausay, Miller, Nuñez, Verma, & Yang, 2013, p. 95). The program is clearly a nudge: parents are not being threatened with punishment if their children do not attend school. Students do not face discipline for low test scores. Instead, families are offered incentives to nudge their behavior in the direction of actions that will lead to better education outcomes. The incentives are cash transfers, yet they are relatively small. For example, an attendance rate of at least 95% amounts to only \$25 per month for families. While this is not an insignificant amount, it still represents a relatively low cost, especially when considered in comparison to other education reforms like hiring more teachers in order to decrease class sizes (Riccio, Dechausay, Miller, Nuñez, Verma, & Yang, 2013, p. 95).

The nudge initially appeared to be successful in certain areas: it prompted some behaviors that are generally associated with improved outcomes, such as small increases in parental engagement and increased use of the public library (Riccio, Dechausay,

Miller, Nuñez, Verma, & Yang, 2013, pp. 93, 104). However, despite these increases, the Family Rewards program “had no effects on (the) students’ school progress” and when follow-up studies were conducted with the same students after another two years, the results held: “The program had no effect on the school performance of elementary and middle school students” (Riccio, Dechausay, Miller, Nuñez, Verma, & Yang, 2013, pp. 93-94).

In other words, this intervention was a failure. Behavioral economics is the foundation of the conditional cash transfer nudge, and behavioral economics can also explain why this specific nudge failed. The specific behavioral insight that is commonly cited to explain the failures of certain conditional cash transfer programs is the crowding out effect. When providing a monetary incentive such as a conditional cash transfer for education inputs or outputs, there are two effects: the “standard direct price effect, which makes the incentivized behavior more attractive, and an indirect psychological effect. In some cases, the psychological effect works in an opposite direction to the price effect and can crowd out the incentivized behavior” (Gneezy, Meier, & Rey-Biel, 2011, p. 192). For example, when financial incentives are offered for students in exchange for passing exams, the lure of the cash can prompt students to increase the amount of time they spend studying. However, the psychological effect could include the weakening of their intrinsic motivation to excel in school. As a result, once the incentives are removed, students might study less eagerly. In other words, “an incentive for a child to read more might achieve that goal in the short term, then be counterproductive as an incentive for students to enjoy reading and seek it out over their lifetimes” (Gneezy, Meier, & Rey-Biel, 2011, pp. 191-192).

This example proves that although behavioral economics can be valuable in improving education outcomes, not every nudge is effective. Furthermore, even if an intervention is effective in a specific context, the same intervention might not be effective at scale. Therefore, it is important to keep in mind throughout Section III that the use of behavioral economics in education reform is a relatively new phenomenon. While promising signs have emerged, programs like Opportunity NYC-Family Rewards prove that more research is still necessary to determine which nudges will have the greatest impact on our education system.

The third example that I will discuss is an example of an effective reform initiative that did not involve behavioral economics: the Better Schools Program in Tennessee. In the 1980s, education reform was dominated by a report called *A Nation at Risk*. The Reagan Administration conducted an evaluation of the state of our national public education system and concluded that our schools were failing so miserably that our nation was at risk. The ensuing report detailed the nature and indicators of the risk, as well as the goals for improvement. The goals were generally aimed at achieving “excellence” in education outcomes (Finn, 2008, p. 106). However, before this report was released, and reforms emanated from the recommendations within the report, significant changes were already being made in the state of Tennessee. Under Governor Lamar Alexander (who later became the U.S. Secretary of Education), a wide-ranging initiative called the “Better Schools Program” was unveiled three months prior to the publication of *A Nation at Risk*.

The Better Schools Program was a comprehensive education reform initiative. The most notable component of the reform package was the Master Teacher Program. The

goal of the Master Teacher Program was to put quality teachers in every classroom and quality administrators in every school and school district (Stedman, 1983, p. 55). Some of the strongest teacher evaluation and accountability mechanisms to date were implemented by the Master Teacher Program. Teacher advancement, in a “career ladder” style, depended on student outcomes (Association for Supervision and Curriculum Development, 1985, p. 51; Parish, 1983, p. 722). Another cornerstone initiative of the Better Schools Program was the commitment to provide more resources to identify, categorize, and then appropriately teach students with “mental handicaps” (Van Allen & Belew, 1992, p. 5). The Better Schools Program also included Project STAR, which limited class sizes to 15 students to provide direct instruction, controlled classroom settings, and stronger teacher-student relationships (Bracey, 1995, p. 89).

None of the major reforms of the Better Schools Program qualify as nudges. The accountability measures for teachers and administrators did not alter their choice architecture. Investing in students with disabilities is critical, but does not change anyone’s incentive structures. Limiting class sizes is an increasingly popular trend in education reform, but also does not qualify as a nudge for students or teachers. Moreover, the program was expensive: for example, in order to reduce class sizes, more teachers had to be hired and paid competitive salaries. To support students with disabilities, more accessible resources had to be purchased and educators with specialized backgrounds had to be hired.

However, despite the lack of incorporation of behavioral economics, the Better Schools Program was a definite success. Tennessee saw quick and significant gains in student achievement in the years immediately following the establishment of the

program. Additionally, Tennessee has continued to make large strides in the quality of their education system, climbing the state education rankings throughout the end of the 20<sup>th</sup> century and even into the 21<sup>st</sup> century (The National Assessment of Educational Progress, 2013, p. 7). The Better Schools Program shows that when significant investments are made in improving education outcomes, noteworthy progress is possible, even without behavioral economics. The contrast with nudging, however, is that the Better Schools Program was difficult to pass in the face of political opposition, an administrative challenge, and a costly expenditure. Nudging, on the other hand, is less politically toxic, easier to administer, and significantly cheaper.

Furthermore, many other education reform efforts that have been attempted without behavioral economics have been far less successful. No Child Left Behind (NCLB), the landmark education reform law of the 21<sup>st</sup> century, fits into this category. Signed into law in 2002, NCLB “required states to create academic standards, annually test children in reading and math in grades three through eight (and once in high school) and hold districts and schools accountable for the results” (McGuinn, From No Child Left behind to the Every Student Succeeds Act: Federalism and the Education Legacy of the Obama Administration, 2016, p. 392). By relying on national standardized tests, it would be possible to have “objective, apples-to-apples comparison of students across classrooms and schools” (Duckworth, Quinn, & Tsukayama, 2012, p. 439).

NCLB included federal “mandates” for states that were unprecedented in their “scope, specificity, and ambition” (McGuinn, From No Child Left behind to the Every Student Succeeds Act: Federalism and the Education Legacy of the Obama Administration, 2016, p. 393). Clearly, NCLB represented the opposite of a nudge: it was

a mandate that created heavy pressure on states to quickly reform and, in some places completely overhaul, their education systems. The entire objective of the education system shifted, with the most important outcome being standardized test scores.

There are many well-documented objections to America's increasing reliance on standardized testing, including the major claim that education is being repurposed for achieving certain scores on the exams at the expense of facilitating true learning (Ravitch, 2011, pp. 15-16). However, some of the concerns about the reliance on standardized testing that was catalyzed by NCLB are inspired by behavioral economics.

First, there is a fear that "in the absence of immediate incentives, many students put forth low effort on the standardized tests" (Levitt, List, Neckermann, & Sadoff, 2012, p. 6). Without grades depending on their performance, students' concentration levels frequently wane over the duration of the long exams. However, because of NCLB, this creates a crucial contrast: "standardized assessment tests are often high-stakes for teachers and principals (e.g., as determinants of school resources), but low-stakes for the individual students choosing to exert effort on the test" (Levitt, List, Neckermann, & Sadoff, 2012, p. 6). Fundamentally, this is an incentive problem: educators have strong incentives for students to excel, while students have almost no incentives at all. Yet when students' standardized test performance has significant consequences – which it did in the NCLB era – the situation is ripe for misrepresentations of students' capacities.

The second issue with the NCLB-prompted reliance on standardized testing is that the tests do not adequately evaluate one of the most important indicators of academic ability and potential: self-control. Two of the most commonly studied predictors of academic performance are intelligence and self-control (Duckworth, Quinn, &

Tsukayama, 2012, p. 440). Intelligence is the “ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought” (Neisser et al., 1996, p. 77). On the other hand, “Self-control refers to the voluntary regulation of attention, emotion, and behavior in the service of personally valued goals and standards” (Duckworth, Quinn, & Tsukayama, 2012, p. 440).

Duckworth, Quinn, and Tsukayama’s research found that standardized test scores “reflect dimensions of student competence related more to intelligence than to self-control,” while report card grades are a better measure of self-control than intelligence (Duckworth, Quinn, & Tsukayama, 2012, p. 451). However, as research from Geiser, Santelices, Bowen, Chingos, and McPherson proves, high school GPA serves as a better predictor than SAT test scores of the likelihood of academic success in college (measured by cumulative college GPA), even without controlling for high school quality or rigor of local grading standards (Duckworth, Quinn, & Tsukayama, 2012, pp. 451-452).

According to Bowen,

“The superior incremental predictive validity of report card grades relative to these widely used standardized achievement tests suggests that grades measure a student’s ability to ‘get it done’ in a more powerful way than do SAT scores...grades reveal much more than mastery of content...Getting good grades in high school, however demanding (or not) the high school, is evidence that a student consistently met a certain standard of performance. It is hardly surprising that doing well on a single standardized achievement test is less likely to predict

the myriad qualities a student needs to ‘cross the finish line’ and graduate from college” (Duckworth, Quinn, & Tsukayama, 2012, pp. 451-452).

One of the benefits of analyzing NCLB is that the legislation included a stipulation that the National Assessment of Educational Progress (NAEP) would serve as the consistent means of evaluation to determine the effectiveness of the reform law (Strauss, 2015). Therefore, the data on student performance over time are reliable and easily comparable. The results clearly indicate that NCLB was unsuccessful: the rate of progress for students was faster in the decade before NCLB took effect than in the years since. Despite NCLB equity goals, important score gaps – such as divisions by race, primary language, and disability – were no narrower, and often wider, than they were in 1998 and even 1990. SAT scores declined from 2006 to 2014 for every demographic group besides Asians, and PISA scores declined across the board from 2002 to 2013 (National Assessment of Educational Progress, 2013; Strauss, 2015).

In conclusion, NCLB represents an ineffective education reform policy that is not inspired by behavioral economics. In fact, it is in large part because NCLB violates key behavioral insights about incentive structures and predictors of success that the policy has failed. It also demonstrates an important contrast with nudging: whereas large-scale education reform initiatives that fail have major consequences (including financial and political costs), a failed nudge is much easier to recover from, given its lower cost and smaller scale. In Section III, I will move on from the larger education reform efforts that have been made in the past to focus on promising research on nudges that can be used in the future to improve student outcomes.

### Section III

In an era of political polarization, it has become increasingly difficult for major reform initiatives to be undertaken by the federal government. Partisanship is even impeding legislative activity at the state and local levels, blocking progress on important issues like education. In this context, nudges can be especially appealing. They are empirically-backed, low-cost interventions that can have significant impacts on student performance. While many of these nudges are for students specifically, others apply to parents and teachers. First, I will describe nudges for students that have been proven to improve outcomes.

Nudges for students can begin as early as pre-K and primary education. The first such nudge is engaging young students in collaborative work to promote task persistence. Behavioral economists have been fascinated by what causes people to work harder and longer. In a traditional economics model, students – even very young ones – would spend just as much time on an individual task if they are alone compared to being with another person. However, basic social instincts tell us otherwise, and experiments have proven that people, particularly young people, are more motivated to remain persistent when working with others.

In one such experiment, children were tasked with completing a challenging puzzle. All children worked on the puzzle alone. However, while children in the randomly selected control group were told that they were working separately from another child, children in the treatment group were led to believe that they were working on the puzzle with another child. The children in the treatment group “persisted 46%

longer and reported liking the puzzle more than children led to believe that they were working separately from the other child” (Butler & Walton, 2013, p. 957). Even the perception of collaboration leads to better outcomes for young students. Therefore, when teachers at the pre-K and primary education levels provide students with tasks to complete, they should consider pairing students to capture the benefits of group work.

The second category of nudges for young students is the offer of non-financial rewards. Researchers have found that the younger students are, the greater their response will be to non-financial incentives (Levitt, List, Neckermann, & Sadoff, 2012, p. 6). One example of non-financial incentives is the offer of certificates of completion for attending academic enrichment programs. This approach, as evidenced in research from Springer, Rosenquist, and Swain, was found to have large effects on increasing attendance in the enrichment programs. By comparison, another treatment group in the study was offered financial attendance incentives, and no effects were shown. For younger children, “Non-monetary incentives might appeal to students in ways that monetary ones do not” (Lavecchia, Liu, & Oreopoulos, 2014, p. 34). When considering why NYC Opportunity-Family Rewards failed, one of the possible explanations is that the extrinsic reward crowded out intrinsic motivation. However, there is a clear and important difference in the case of the certificate of completion example: this nudge involves the use of non-financial incentives, compared to the offer of cash rewards in New York City. The non-financial nature of the reward could weaken the potential crowding-out effect that was seen in the conditional cash transfer.

Similarly to promoting collaborative work, offering non-financial incentives like certificates is a nearly cost-free intervention, inspired by behavioral economics, and

proven to positively impact the performance of young students. Pre-K and primary schools should embrace both of these nudges as they seek to prepare their students for the upper levels of education.

The next set of student nudges to analyze is interventions for high school students. The most-researched nudges for high school students are mindset interventions. These nudges can be employed even before high school begins. In fact, as research from Allensworth and Easton shows, the transition to high school is crucial because students who fail to complete 9<sup>th</sup> grade core courses graduate at dramatically lower rates and have much poorer life prospects. Therefore, “improving the transition to high school is an important policy objective (Walton, Dweck, & Greene, 2016, p. 376). To accomplish this objective, growth mindset interventions can be established. The “growth mindset” concept, and interventions designed to instill it, were developed by Carol Dweck and describe an individual’s belief in their ability to increase their intelligence:

“The growth mindset intervention counteracts the fixed mindset (also called an entity theory of intelligence), which is the belief that intelligence is a fixed entity that cannot be changed with experience and learning. The intervention teaches scientific facts about the malleability of the brain, to show how intelligence can be developed...The growth mindset intervention aims to increase students’ desires to take on challenges and to enhance their persistence, by forestalling attributions that academic struggles and setbacks mean one is ‘not smart’” (Walton, Dweck, & Greene, 2016, p. 375).

When students believe in a growth mindset instead of a fixed mindset, they are more likely to persist in the face of difficulties. The exercise that Dweck and her fellow researchers designed to instill a growth mindset in rising high school freshmen was a program that taught students about the malleability of the brain and then had them write reflections on their findings to reinforce the main concepts. After just two sessions of the exercise, all students had more positive learning-oriented attitudes and beliefs, and the grades of the lowest-performing students rose (Walton, Dweck, & Greene, 2016, p. 388). The program is an extremely low-cost nudge that can be implemented at scale because it was designed to be administered as an online program. By encouraging students to remain resilient, statistically significant improvements in GPAs can be made for large quantities of diverse student populations (Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015, p. 785). High schools would benefit from offering this program to incoming freshmen as a means of mentally preparing the students for the rigors of secondary education.

Once the students enter high school, there are a variety of other “mindset intervention” nudges that can improve outcomes. For example, establishing a “purpose for learning” has been proven to be effective with students in the ninth through twelfth grades. A purpose for learning is “a goal that is motivated both by an opportunity to benefit the self and by the potential to have some effect on or connection to the world beyond the self” and incorporated within this definition is a “focus on the motive or rationale for the goal (e.g., ‘helping people’ rather than on content of a goal (e.g., ‘being an engineer’))” (Yeager, et al., 2014, p. 560).

In the past, mindset interventions have been designed to link pro-social, self-transcendent motives to behavioral persistence on tasks outside of education. According to research from Grant, Grant & Hoffman, and Feiler, when telemarketers were asked to contextualize their work by thinking about helping poor children instead of benefitting themselves, they raised more money, and when medical professions were told to wash their hands to keep others healthy, they were more likely to do so (Yeager, et al., 2014, pp. 560-561). Yeager studied similar mentalities in high school students, determining if activities like studying, solving math problems, and going to college were done for self-oriented or self-transcendent motives. He found that a “self-transcendent purpose for learning...predicted more grit and more academic self-control and showed a modest correlation with a greater number of boring math problems solved in the face of tempting media (Yeager, et al., 2014, p. 565).

Yeager also designed a mindset intervention, attempting to reframe students' thinking to be driven by a purpose beyond the self for classes in science, technology, engineering, and mathematics (STEM). After following up with the students who underwent the intervention, he found that their grades in STEM subjects improved (Yeager, et al., 2014, p. 569). Yeager's research displays the potential effectiveness of a mindset intervention that nudges students to think about higher-level purposes for the daily requirements that come with the territory of high school classes. With particular applications for STEM subjects – which are growing in their popularity and perceived importance – this nudge would be valuable for high schools to adopt in order to improve student outcomes.

Another example of a nudge for high school students is a values-affirmation mindset intervention. This type of intervention is specifically geared towards minority students who might feel a lack of belonging in school, based on negative stereotypes. By strengthening personal values and experiencing a sense of solidarity with others who have experienced the same issues in the past, the notion that students are more than negative stereotypes is reinforced (Aguilar, Walton, & Wieman, 2014, p. 47).

To this effect, a mindset-intervention nudge was created for students in an introductory high school physics class in which the results of a survey of successful graduates of the same course are shared. “The survey indicates that most students initially worry about whether they belong in physics, but over time they come to feel at home” (Aguilar, Walton, & Wieman, 2014, p. 46). Students were then given opportunities to reflect on the information. The intervention can be conducted in a single class period or as part of a homework assignment. The result of the intervention was that the achievement gaps in physics classes between male and female students, as well as between majority and minority students, were substantially closed (Aguilar, Walton, & Wieman, 2014, p. 46). The potential to use similar interventions for other classes and other levels of schooling exists as well, and will likely be studied further as the field grows. In the mean time, this specific values-affirmation nudge has strong potential to create better outcomes for female and minority students. Combined with the growth mindset intervention, this program shows that the high school level is a setting in which nudges can be valuable contributors to improved student performance.

Yet the level at which the most nudges have been tested is higher education. Like the high school level, some of these interventions begin even before the start of college

classes. In fact, one intervention pertains specifically to the college search process. According to Hoxby and Turner, high-achieving students from low-income backgrounds tend to “disproportionately apply to less selective colleges, despite being able to get into better schools” (Lavecchia, Liu, & Oreopoulos, 2014, p. 12). Several factors can explain this phenomenon, but all stem from the reality that students who fit in this category typically lack personal exposure to highly selective colleges. Therefore, they are led to believe that such a level is inaccessible to them. To combat this perception, a group of 39,000 students across the United States were randomly selected into a treatment or control group. The treatment group received a package of information about selective schools, and instructions and encouragement to apply to such schools, while the control group did not receive the information.

The results of the intervention were encouraging: the treatment group students applied to more colleges, and they were 40 percentage points more likely to apply to a selective college and 5 percentage points more likely to enroll in a selective college. Furthermore, the students who chose to enroll in the selective colleges persisted in the more rigorous academic settings at the same rates as their peers in less-selective schools, “suggesting that the high-achieving, low-income students who were induced to apply to and enroll in more selective colleges by the intervention were not underprepared” (Lavecchia, Liu, & Oreopoulos, 2014, p. 44).

This intervention has clearly been effective: for the cost of simply sending a package of information, students can be nudged towards applying to more selective colleges at which they can succeed and be better prepared to have successful careers. Once again, in a traditional economic model with perfect information, the students would

already be aware of the benefits of applying to more selective schools. Sending a package of information like the one described in this example would be futile. However, as the results of this intervention prove, students do not have perfect information. They need nudges to guide them in the direction of pursuing more challenging paths that will better prepare them for their futures. In other words, nudges can fill the void between where economic models predict that people will be, and where they truly are.

Another nudge that attempts to expand students' college search process came from a change in the format of the ACT college entrance exam in the Fall of 1997. Before that point, anytime a student took the ACT, they could send their scores to three schools for free. Any additional score report would cost \$6 to be sent. As a result, nearly 80 percent of ACT takers sent exactly three reports (Lavecchia, Liu, & Oreopoulos, 2014, p. 58). Pallais' research found that after increasing the number of free reports from three to four, more than 70 percent of students sent exactly four reports (Lavecchia, Liu, & Oreopoulos, 2014, p. 58).

The shift in the number of score reports that the overwhelming majority of students send from three to four reveals the power of defaults. Given the significance of selecting a college, a \$6 fee to send an additional score should not be prohibitive. The change in the number of reports that most students send was not driven by the fourth score report suddenly becoming affordable. Rather, it reflects students' responsiveness to defaults. The impact of default options is one of the key concepts in behavioral economics. The default option is "the outcome that happens if agents do nothing" (Madrian, 2014, p. 11). In the case of ACT score reporting, the number of free reports

that can be sent on an exam is acting as a default, since the vast majority of students send exactly that number.

Selecting a default is a “particular type of framing effect, where a choice between two options A and B is affected by designating either A or B as a default option. The option designated as the default has a large advantage in such choices, even for decisions that have considerable significance” (Kahneman, 2003, p. 1459). Once again, this contradicts a basic assumption from traditional economic models. In a traditional model, as long as transaction costs are small (which a \$6 score report is), defaults should have minimal impact on decisions: “agents will opt out of any default that is not consistent with their preferences” (Madrian, 2014, p. 11). However, in practice, this is often not the case, even in consequential decisions such as whether employees will enroll in savings plans. “In the United States, savings plan participation rates are substantially higher when the default is automatic enrollment in the savings plan (i.e., individuals must opt out if they prefer not to save) than they are when individuals must take action to participate in the savings plan” (Madrian, 2014, p. 12).

When it comes to critical decisions about personal finances, or college selection, it would seem that people would take their time to carefully consider their options. However, research suggests that they are heavily swayed by the default. If three ACT score reports are free, most students will send exactly three. If the default is changed to four, most students will send exactly four. If we want to encourage students to expand their college horizons and consider a greater number of options, then increasing the default number of schools to which students can send their standardized testing scores without a fee would be an effective nudge.

Once students select their college, another challenge is making sure that they make it to their first day of classes. According to research from Castleman and Page, “roughly 20 to 30 percent of college-accepted high school graduates in urban districts fail to matriculate in college in the fall” every year (Executive Office of the President National Science and Technology Council, 2015, p. 9). This phenomenon is known as the “summer melt” and stems from students failing to complete tasks such as filling out course-enrollment and financial aid forms and taking placement tests (Executive Office of the President National Science and Technology Council, 2015, p. 9). Given the relative ease of these tasks and the lack of time required to complete them, this seems like a problem that could be addressed at a relatively low cost, and indeed it is.

The White House Social and Behavioral Sciences Team (SBST) launched a project designed to reduce summer melt and increase college-enrollment rates. They created a series of text messages that reminded students of the pre-matriculation tasks that they needed to complete over the summer and sent them to a treatment group of students. The texting intervention proved effective, boosting college enrollment by 3.1 percentage points (from 64.9 percent to 68.0 percent). The impact of the texts was particularly large for the lowest-income students, who saw a 5.7 percentage point increase in college enrollment (from 66.4 percent to 72.1 percent...), amounting to 8.6 percent more low-income students successfully enrolling in college” (Executive Office of the President National Science and Technology Council, 2015, p. 10). Although the increases seem small, scaling this intervention could result in a significant quantity of students enrolling in college who otherwise would be victims of the summer melt. This text-messaging program is a popular example of effective nudging: the costs of sending

these messages are low, students face no mandates or restrictions, and yet they are clearly being influenced to take actions that will prove beneficial to them in the long-run.

The final pre-college nudge that I will discuss is a mindset intervention used for incoming college freshmen. This specific nudge is known as a “lay theory intervention.” Rising freshmen are taught that “challenges in the transition to college are common and improvable and, thus, that early struggles need not portend a permanent lack of belonging or potential” (Walton, Dweck, & Duckworth, 2016, p. 1). A single-session online program was developed to teach the lay theory to a treatment group of incoming college students randomly selected from three institutions. The nudge was successful: the grades of students from low-income backgrounds who completed the online program had higher cumulative first-year GPAs, which reduced the socioeconomic achievement gap at the three colleges by 31-40% (Walton, Dweck, & Duckworth, 2016, p. 1). Like the mindset interventions for high school students, this nudge – given its online administration – is a low-cost, scalable method proven to lead to better outcomes for students. All colleges, and particularly ones attempting to close income-based achievement gaps, should consider implementing lay theory interventions for rising freshmen.

Once students enter college, mindset interventions can still be valuable. For example, at McGill University, at-risk students were randomly selected for assignments to one of two groups: the control group was simply asked to complete a personality test, while the treatment group completed an online program in which they defined long-term goals and planned immediate steps to achieve them. The latter option, a nudge, resulted in higher GPAs (by half a point) by the end of the semester for the students in the treatment group (Lavecchia, Liu, & Oreopoulos, 2014, p. 30). By nudging students to

think about long-term goals, the researchers were able to counteract the forces of discounting described in the introduction of this paper. By influencing college students' choice architecture, this nudge helps to place the immediate academic challenges that students face in the context of the long-term benefits of a college degree.

Another nudge for college students that has been studied is the use of financial incentives. Although the New York City conditional-cash-transfer program described in Section II was a failure, I mentioned in that section that other financial incentive programs have been proven to be successful. One example is West Virginia's PROMISE scholarship, which is a merit-based scholarship that provides a tuition waiver to students who meet specific GPA and course load benchmarks. "Students who receive the scholarship are more than 6 percentage points more likely to receive at least a 3.0 GPA through college (46 versus 40 percent) and are 7 percentage points more likely to graduate within 4 years than students who just missed out on receiving the award (33 versus 26 percent)" (Lavecchia, Liu, & Oreopoulos, 2014, p. 32). By comparing students who received the scholarship with those who just missed the cutoff, researchers are able to analyze the performance of students with nearly identical capabilities. The difference in the results suggests that the PROMISE scholarship is effectively influencing its recipients to perform better and graduate on time.

The question here is not whether the PROMISE scholarship works: students who receive the scholarship earn better grades and are more likely to graduate than similar students who do not receive the scholarship. The real question is whether this program qualifies as a nudge. Referring back to the originally established definition, one of the important features of a nudge is that it influences behavior without "significantly altering

costs.” I described a hypothetical situation in which an individual is offered \$500 to eat vegetables instead of cookies. Most people who otherwise would eat cookies would probably consume the vegetables – showing that the incentive effectively altered their choice architecture – but clearly the financial incentives were being drastically changed. In other words, this is not a nudge, but really a bribe. Could the PROMISE program be a similar incentive, which only keeps students in school because it pays substantial portions of their tuition? There are certainly reasons to suggest that the PROMISE program would not qualify as a nudge, and indeed its categorization is borderline. However, experts in the field of behavioral economics and education, like Adam Lavecchia, Heidi Liu, and Philip Oreopoulos, define PROMISE as a nudge. Judith Scott-Clayton agrees, writing that the impacts of the program,

“ are strongly concentrated around the specific annual achievement thresholds for PROMISE renewal, particularly the course load requirements. For example, at the end of the freshman year, PROMISE recipients were nearly 25 percentage points more likely to have earned 30 or more credits, the threshold for PROMISE renewal. Tellingly, the annual impacts are roughly constant in the freshman through junior years, but virtually disappear in the fourth year while students are still receiving PROMISE funds but no longer have the opportunity to renew. I conclude that a traditional grant with no strings attached would not produce the same pattern of effects” (Scott-Clayton, 2011, p. 618).

An argument for why the PROMISE scholarship is not a nudge is because the quantity of money that a student can receive represents a large portion of their budget – large enough to significantly alter their costs. Again, this evidence shows that the PROMISE program is not an inarguable nudge. However, it should be noted that a cost advantage of the PROMISE program is that it is not any more expensive than other merit-based scholarships that universities provide to students. The PROMISE scholarship represents an innovative and potentially more effective way in which colleges could offer merit-based aid: with strings attached, such that students need to fulfill certain requirements to keep their scholarship. In doing so, the schools will be incentivizing students to get better grades and graduate on time, both of which are positive outcomes for all actors involved.

The final set of nudges for students that I will describe is concentrated on improving repayments of student loans. This is another area in which the White House SBST has been active. In one project, the SBST sent email reminders to student loan borrowers who had missed their first payment, designed to “help borrowers who were new to repayment and for whom missed payments may have been inadvertent” (Executive Office of the President National Science and Technology Council, 2015, p. 10). After just one week, the reminder email led to a 29.6 percent increase in the fraction of borrowers making a payment, indicating that “low-cost email notices and reminders can be an effective tool for promoting payment among some borrowers who fall behind (Executive Office of the President National Science and Technology Council, 2015, p. 10). Given the low cost and effective alterations of choice architecture, interventions such as this email reminder are classic nudges.

Another nudge in this category relates to income-driven repayment (IDR) plans to pay back student loans. IDR plans link the monthly loan payments that borrowers must make to their incomes, which can be helpful for borrowers who are struggling with debt. However, for these plans to be effective, “borrowers need to know IDR plans exist, understand the associated options and tradeoffs, and determine whether these plans are a good fit for them” (Executive Office of the President National Science and Technology Council, 2015, p. 11). Therefore, the SBST sent out emails to a large sample borrowers who had fallen behind on loan payments, dividing the group into a treatment group that received information about IDR plans and how to sign up for them and a control group that continued to receive payment notices without the additional information. Ultimately, IDR application rates were four times higher among borrowers who received the emails than those who had not (Executive Office of the President National Science and Technology Council, 2015, p. 11).

Both of these programs, rigorously tested through randomized-controlled trials by the White House SBST, represent effective mechanisms for helping students pay off their loans. They are quintessential nudges: low-cost interventions that influence choice architecture by providing information. All of the nudges described heretofore in this section are designed for students and are proven to improve education outcomes. However, there are other actors in the education system who can also be nudged to improve student performance.

The next set of nudges that I will describe is designed for parents. The type of home that a student grows up in has a significant impact on their prospects for success in school and in life. Researchers such as Crosnoe; Englund, Luckner, Whaley, & Egeland;

Epstein & Sanders; Hill et al.; and Suizzo & Soon have found that “parental involvement is associated with a wide range of school-related outcomes for low- and high-achieving children across demographic factors (e.g., race, gender, age, and socioeconomic status)” (Cooper, Crosnoe, Suizzo, & Pituch, 2010, p. 862). For example, Hill and Crosnoe & Cooper found that particularly in the early years of schooling, “children with highly involved parents have better developed prereading and mathematical skills” (Cooper, Crosnoe, Suizzo, & Pituch, 2010, p. 862). When Gorard et al. conducted a comprehensive review of evidence linking attainment to attitudes and aspirations, they concluded that “only parental involvement in education offered any promise as a causal contributor to attainment” (See & Gorard, 2015, p. 253). According to research from Sacerdote, children quasi-randomly assigned via adoption to highly educated parents are 16 percent more likely to complete four years of college (Fryer, Levitt, & List, 2015, p. 1).

While it is evident that effective parental involvement contributes to students’ success, it is less clear that policymakers can do anything to prompt better outcomes in this arena. It is extremely difficult to legislate parenting. However, behavioral economists are increasingly finding that the situation is ripe for nudging. Two kinds of nudges that I will discuss are financial incentives and text-message interventions. The first category, financial incentives, can be divided into conditional- and labeled-cash transfers. Unlike financial incentives for students, which have a mixed record of effectiveness, these cash transfers, intended to increase parental involvement in their children’s education, have been generally successful.

The conditional-cash transfer (CCT) program launched in Chicago Heights in the 2011-2012 school year and paid parents for proof of their children’s homework

completion, their children's performance on benchmark assessments, and their attendance at Parent Academy sessions, in which they learned best practices for supplementing the education that their children were receiving in school (Fryer, Levitt, & List, 2015, p. 2). For the Hispanic and white students whose parents received the cash transfers in the study, there were large and statistically significant improvements in both cognitive and non-cognitive domains (Fryer, Levitt, & List, 2015, p. 3). The results of this CCT nudge show the potential for such interventions to inspire parental involvement, which can lead to better outcomes for students.

However, one of the criticisms of CCTs is that they are expensive to administer, beyond the cost of the transfer itself. In order for the program to run effectively, public officials must closely monitor the fulfillment of the benchmarks that must be met for parents to receive the cash. An alternative approach that has emerged is the labeled-cash transfer (LCT). Unlike the CCT, in which the cash is not transferred until the requirements have been met, an LCT involves an upfront transfer of cash that is designated for a specific purpose. One LCT program that was introduced as an "education support program" gave small cash transfers to the fathers of schoolchildren. For the students in the treatment group, there were "large gains in school participation" because the program "increased parents' belief that education was a worthwhile investment," while the cost of the program was substantially lower than a typical CCT in education (Benhassine, Devoto, Duflo, Dupas, & Pouliquen, 2013, p. 1). Although the research on LCTs in education is limited, these results show promise for the use of "education support transfers" to lead to better student outcomes. Furthermore, unconditional cash transfers have recently begun to gain a reputation for being highly

effective in boosting the quality of life for the poor, providing an added benefit to an education LCT (Cunha, 2014, p. 2).

Financial incentives for parents that are designed to improve the education outcomes of their children appear to have the potential to be effective. However, there is another type of nudge for parents that has also been proven to make a significant impact – and at a much lower cost: text-message interventions. Like the text messages sent to students, this intervention for parents exemplifies the concept of nudging: low-cost influences that can be easily ignored, yet lead people to take actions that will be beneficial, in this case by improving student outcomes.

The use of behavioral economics in education with parents through text messaging can begin as early as the first years of a child’s life. These years are crucially important, and differences that emerge at a young age can manifest themselves in persistent achievement gaps in the future. For example, Hart and Risley found that by the age of four, children from poor families will hear about 30 million fewer words than children from higher-income backgrounds (York & Loeb, 2014, p. 1). This “word gap” is associated with disparate education outcomes later in life, causing for many education equality advocates to call for measures to close the gap. However, once again, it is difficult to legislate parenting. Text-message nudges can be an important part of the solution.

In the *READY4K!* program in California, the parents of preschoolers receive three text messages per week with information about enhancing early literacy skills for their children. The researchers found that the intervention led to parents becoming more engaged with their children’s teachers and “increased the frequency with which parents

told stories, pointed out two words that begin with the same sound, pointed out two words that rhyme, recited nursery rhymes, looked at pictures in a book, showed the different parts of a book, and played games or worked on puzzles with their children” (York & Loeb, 2014, p. 3). As a result, the students of these parents had higher levels of alphabet knowledge. Furthermore, the gains from the text messages were especially large for black and Hispanic students, helping to close the word gap and subsequent achievement gap. All of these accomplishments came at a low cost: less than one dollar per family per year was spent on the text messages, and given the nature of the program, there would be almost no cost to scale (York & Loeb, 2014, p. 3).

The *READY4K!* text-messaging initiative represents an effective and efficient nudge with proven benefits. It is not the only text-messaging intervention for parents that has been proven to work. Another experiment was designed to address the information friction that frequently exists with parents whose children withhold or falsify updates on their academic performance. To provide parents’ with up-to-date information on the academic developments of their children, text messages (as well as emails and phone calls) were sent with detailed lists of missing assignments and grade reports. When parents were more informed, they became more involved and their children performed better. “Parents in the treatment group contacted the school 83% more often than the control group and parent-teacher conference attendance increased by 53%” (Bergman, 2015, pp. 1-2). The effects for students were impressive: assignment completion increased by 25 percent and the likelihood of unsatisfactory work habits and cooperation decreased by 24 percent and 25 percent, respectively. The number of classes missed by students decreased by 28 percent. Most importantly, high school students’ GPAs

increased by .19 standard deviations, an approximately equivalent gain to the effect of expensive reforms such as introducing high-quality charter schools (Bergman, 2015, p. 2).

The student report text messages show the potential power of nudging in education: for virtually no cost at all and without any real backlash, a program was introduced that had the same effects for a student as sending him or her to a high-quality charter school. Of course, charter schools cost significant amounts of money and represent a politically toxic issue. Through nudges like this text-messaging intervention, those costs and risks can be avoided, with the same benefits received.

One final type of text-messaging nudge for parents is between teachers and parents. In one experiment with 6<sup>th</sup> and 9<sup>th</sup> grade students, “teacher-family communication increased the odds that students completed their homework by 40%, decreased instances in which teachers had to redirect students’ attention to the task at hand by 25%, and increased class participation rates by 15%” (Kraft & Dougherty, 2013, p. 1). This type of text-messaging intervention is another example of a low-cost, easily-administered nudge that is having significant impacts on student outcomes. It should be embraced by all K-12 schools as a simple method that will lead to better results. If more schools embrace the role of technology in fostering better connections with parents, then home situations will be more suitable to promote learning. Given the research linking parental involvement and family atmosphere with education outcomes, these nudges seem like an important step to improving our education system.

The last category of interventions that I will discuss is nudges for teachers. Quality teachers are an imperative for a school to be successful in helping students to

learn and preparing them for their futures. It is a public priority to ensure that there is a quality teacher in every classroom. However, achieving this goal might require large financial investments – as significant increases in teacher pay would be necessary to attract better talent – and has also proved challenging politically, as teachers’ unions frequently attempt to block measures that would threaten to remove current teachers from their positions, even if their students have consistently underperformed. Once again, nudges represent a potential alternative, offering lower-cost solutions that are more politically feasible.

One such nudge is concentrated on reducing teacher absenteeism. Currently, one in four American teachers misses ten or more school days every school year (Sparks, 2016). Students whose teachers miss ten or more days have lower math achievement and less engagement in school (Miller, Murnane, & Willett, 2008, p. 181). It should be noted that this statistic is referring to days of class missed beyond the allotted number of sick days. One nudge to ameliorate this situation is to tie teacher pay to the number of days that teachers spend in the classroom (instead of a fixed monthly amount). Again, it should be noted teachers still receive sick days. When Duflo et al. attempted such an arrangement in a 2012 study, they found a “21–percentage point decrease in teacher absenteeism with the incentive scheme compared to the fixed salary. In addition, higher teacher attendance also translated into improved test scores” (Madrian, 2014, p. 37).

While teachers’ unions have reasonable objections to tying teacher pay to student test scores, it would be difficult for them to make a public case against a measure to ensure teachers are in the classroom. Also, teacher pay would not need to increase in this program – making it essentially cost-neutral. In fact, because absent teachers would

receive less money than teachers with perfect attendance, there would even be savings from this program. As the evidence suggests, the impact is large, both in fulfilling the immediate goal of reducing teacher absenteeism and the ultimate goal of improving student outcomes. However, similarly to the aforementioned PROMISE scholarship, it could be argued that this program is not truly a nudge, but rather a form of discipline that significantly alters cost structures. Teachers could potentially lose relatively large portions of their monthly salaries. However, behavioral economists still categorize this payment system as a nudge because it is easy to administer and a far less expensive way to improve teacher performance than firing teachers and hiring new replacements. Like PROMISE, it seems to be an uncertain characterization, but clearly has positive results.

One other method of nudging teachers using financial incentives is to embrace the concept of loss aversion. Loss aversion, introduced by Kahneman, is a central principle of behavioral economics, reflecting people's tendency to be twice as sensitive to losses as they are to gains of an equal magnitude (Madrian, 2014, p. 27). Recognizing this reality, researchers decided to test if loss aversion could be harnessed to nudge teachers to perform better, judged by improvements in their students' test scores. The experiment involved randomly selecting three groups of teachers: a control group, which received a static salary; a "gain" treatment group, which received traditional bonuses at the end of the year linked to student achievement; and a "loss" treatment group, in which teachers were given a lump sum payment at the beginning of the school year with instructions that they would have to return some or all of it if their students did not meet performance targets. For both of the treatment groups, teachers whose students had the same level of

performance would receive the same final amount of money (Fryer, Levitt, & List, 2015, p. 3).

At the end of the year, the financial incentives framed as gains had no impact at all on student performance compared to the control group. However, students whose teachers were in the “loss” group showed large and statistically significant gains in their math scores (Fryer, Levitt, & List, 2015, p. 3). The results of this experiment confirm behavioral insights on loss aversion: equivalent amounts of money, depending on their framing as losses or gains, have divergent results on student outcomes. By understanding behavioral economics concepts like loss aversion, nudges can be implemented for teachers to improve the performance of their students.

As Section III shows, nudges can also be used for students at every level of schooling, as well as their parents. Embracing these interventions can lead to improvements in inputs throughout the education system, such as attendance, task persistence, and growth mindsets, which can lead to better outputs, including improved test scores, higher GPAs, and increased likelihoods of going to college. For all of these positive outcomes, the cost of implementing the nudge reforms is low.

## Conclusion

Although our education system is in need of comprehensive overhaul, which will prove complicated and costly, nudges represent a high-impact, low-cost path for reform that can be made immediately and have been proven to improve student outcomes. These nudges are inspired by the rising field of behavioral economics, which has already played

a role in education reform initiatives since World War II, whether explicitly or not. By embracing the potential of influencing choice architecture for actors in the education system, progress can be made in fixing America's public schools. Every school in the United States would benefit from establishing task forces to study the existing literature on nudges. Then, they should take steps to implement the most appropriate nudges for their specific school.

Behavioral economics can be used to incentivize people to choose blueberries instead of bonbons, and the field can also be used to reform our education system. Given the challenges associated with comprehensive reform that have heretofore proven to be nearly insurmountable, nudges represent a more politically practical and economically efficient option for improving outcomes.

No matter where people position themselves along the political spectrum, everyone agrees that the obligation to provide children with access to quality education is a worthy goal. Every time that we fail to take action to fix our schools, or pass legislation that has a net negative impact, we squander the potential of yet another generation. We cannot afford to continue to wait for a magic bullet. We know that interventions inspired by behavioral economics can make a difference, and it is time to embrace the power of nudges to help our students fulfill their potential.

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