

# Global Good Pre-Read: Choice Architecture

## Introduction

Every decision we make requires sorting through a myriad of cues and pieces of information. Intentional use of *choice architecture* structures the cues we receive and helps people navigate the decision-making process more efficiently and effectively. It seeks to organize the context in which humans make choices so that they can pick the option that best meets their needs.

This year's U.S. Program-Global Good session will focus in part on how choice architecture can be used to support student success in the transition from high school into postsecondary in the United States. Innovators in fields ranging from healthcare to finance have pioneered the use of choice architecture in recent years, but its application in the educational realm remains relatively new. As such, this session will draw on the principles underpinning effective choice architecture, how it has been used in non-education contexts and its emerging application in secondary and postsecondary education. In addition, we will demo a handful of promising education products that put choice architecture concepts to good use.

Two expert speakers will provide context for the session:

- Harvard professor and behavioral economics expert **Sendhil Mullainathan** will set out the core concepts of choice architecture and walk us through how the field has evolved in recent years.
- Georgia State University Vice Provost of Enrollment & Student Success **Tim Renick** will provide a practitioner's perspective on how choice architecture can be used to enhance student success at the postsecondary level.

Our discussion of choice architecture builds in part on last year's Global Good session on the use of learning analytics to improve instruction and student outcomes. Learning analytics enables educators and administrators to track student progress and identify common predictive factors indicating when a student might benefit from additional support. Choice architecture then mobilizes these insights and designs interventions that provide needed assistance while also taking into account how the human mind works and how its innate tendencies can be harnessed to produce better outcomes.

This document offers an overview of choice architecture and its various applications. It sets out the fundamental concepts underpinning the field, identifies key principles and tools employed by choice architects and explores how it has been mobilized in non-education sectors - e.g., to increase retirement savings, protect credit card holders and reduce secondary infections in hospitals. It concludes with a brief examination of how choice architecture is currently being used to improve student success as young people move from high school to college. Finally, a glossary of key terms and concepts used throughout is provided at the end of this document.

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Any person who structures a decision-making context for someone else is, in essence, a choice architect. Consider the high school counselor who shares educational pathway options with students or the graphic designer who lays out a college brochure. The doctor who offers treatment options with patients is also a choice architect, as is the human resources administrator who manages employees' health plan enrollment.

While some features of choice architecture are overt--such as when an airline website prompts you to buy travel insurance with your plane ticket--others exert their influence more subtly. Scanning a restaurant menu, you read through the options in the order laid out by the menu designer. At the grocery store, you're more likely to buy the laundry detergent stocked at eye level than the brand located near the floor. A flat plate on a door signals that it will open with a push rather than a pull.

Choice architecture can also be used for more self-serving purposes, such as when online retailers pre-check newsletter subscription boxes on order forms. These "dark patterns," as they are known in the field of user experience, use behavioral insights to trick people into particular actions that do not necessarily have the users' best interests at heart. For instance, some casinos have electronic slot machines that are programmed to display misleading "near misses" in order to encourage gamblers to play longer.

In the hands of a well-intentioned practitioner, however, choice architecture can help people act in ways that align with their best interests. For instance, by implementing checklists for surgeons and other medical staff to follow, hospitals have drastically reduced secondary infection rates. Many ATMs have been redesigned to alert you when you leave your card in the machine after withdrawing cash. Some school cafeteria managers now put salad bar items in easy reach and eye level of students in order to encourage healthier decisions.

Choice architecture can also be used to support students in the transition from high school to postsecondary education. Students are particularly vulnerable to missteps during this time given the many pressing tasks demanding their attention. Some students become overwhelmed and fail to complete key elements of the application process. Lack of familiarity with college-going and concerns about money lead many high-achieving students from low-income households to apply to less selective schools--even when they would likely be admitted at more prestigious schools that could provide substantial financial aid. Thoughtful choice architecture can help students navigate this transition more successfully by providing the information and motivation to make choices that increase their likelihood of applying to and enrolling in postsecondary.

Among the many tools at a choice architect's disposal, the most well-known is the **nudge**. Nudges are discrete, targeted interventions designed to keep people on track and improve the quality of their decisions. For example, a nudge might take the form of timely text reminders, which have proven effective in guiding students to follow through on their college plans. Other tools of choice architecture include targeted feedback; streamlining complex information; visual cues and smart defaults. These devices--used alone or in combination--can have a sizable

positive effect, particularly if the choice architect possesses a firm understanding of how people think and make decisions.

## Choice Architecture Explained

Choice architecture permeates our lives. It's intrinsic to every human-created system we encounter, whether a mountainside trail or a multi-page website. The difference between effective and ineffective choice architecture boils down to intention: Did someone consciously choose how the options were presented? Well-planned choice architecture can guide people through decisions with ease, but without intentionality it can end up leading people in circles.

The field of choice architecture emerged in large part from the collaboration of psychologists Daniel Kahneman and Amos Tversky. The two met in 1969 and embarked on a 14-year investigation of human intuition and its effects on judgment. Together Kahneman and Tversky conducted and published research that provided the early foundations of the field of choice architecture.<sup>1</sup>

One of the key concepts underpinning choice architecture is the idea that two systems govern human decision-making. As Kahneman explained in his best-selling work *Thinking Fast and Slow*, System 1--the Automatic System--operates on autopilot. It's the jackrabbit in our brains: quick, emotional, intuitive and impulsive. This is the system that compels you to check your Twitter feed even though you're on a deadline. It can detect sarcasm in someone's voice, helps you swerve to miss debris on the highway and supplies the answer to  $2 + 2 = \underline{\quad}$ .<sup>2</sup>

System 2, by contrast, is the slow, methodical and deliberate part of the brain. Also called the Reflective System, it's our rational side that weighs options and carefully considers consequences before deciding what to do. It's also the system we deploy when doing long division or digesting a dense article. If System 1 is the impulsive jackrabbit, System 2 is the methodical turtle.<sup>3</sup>

Behavioral science has shown that, despite our best intentions, the Automatic System is often in charge of our decision-making process--whether we realize it or not. For instance, Kahneman once recounted meeting with the chief investment officer of a financial services firm who had invested tens of millions of dollars in the Ford Motor Company. The impetus behind the executive's decision: He had been impressed with the Ford cars he had seen at a recent automotive show. Rather than taking the time--and expending the cognitive energy--to evaluate the stock, he went with his gut. He liked the cars and therefore liked the stock. "From what we

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<sup>1</sup> For more on the lengthy collaboration between Kahneman and Tversky, see Michael Lewis, *The Undoing Project: A Friendship That Changed Our Minds* (New York City: W. W. Norton & Company, 2016).

<sup>2</sup> Daniel Kahneman, *Thinking Fast and Slow* (New York: Farrar, Strauss and Giroux, 2011).

<sup>3</sup> Kahneman, *Thinking Fast and Slow*.

know about stock picking,” says Kahneman, “it is reasonable to assume he did not know what he was doing.”<sup>4</sup>

Concentrated thinking requires a lot of mental attention and energy, and System 2 tires easily. So System 1 takes over, prompting spontaneous or emotional choices that may not serve our needs. This helps explain why a high school senior ends up choosing a college based on campus amenities or convenient location rather than fully weighing considerations such as academic rigor and overall fit. In the face of complex choices and information, we fall back on System 1.<sup>5</sup>

Thoughtful choice architecture can bridge the gap when System 2 falters. It can also harness System 1’s impulsivity to direct people toward better decisions. In their best-selling study *Nudge: Improving Decisions About Health, Wealth and Happiness*, Richard Thaler and Cass Sunstein show how a host of tools--from streamlining information to setting defaults--can be used to create better contexts for decision making. To be truly effective, the authors argue, use of these tools must be grounded in a clear understanding of how people think and behave.<sup>6</sup>

## Tools of Choice Architecture

Choice architects can choose an array of key principles and tools to support better decision making. These elements, often used in combination, compensate for people’s shortcomings when it comes to paying attention, identifying important information and following through on plans.

<b>Key elements of choice architecture</b>	
<b>Expect error</b>	Designing processes that account for human fallibility makes it easier for users to recover from mistakes.
<b>Meet people where they are</b>	Incorporating interventions into platforms and places where users already go makes it more likely that interventions will reach their target audience.
<b>Simplify information</b>	Simplifying information and reducing complexity allows users to access critical details easily while also reducing cognitive load.
<b>Make processes easier to navigate</b>	Streamlining complicated processes and improving navigability make it more likely that users will complete a given task or set of tasks.

<sup>4</sup> Kahneman, *Thinking Fast and Slow*.

<sup>5</sup> Kahneman, *Thinking Fast and Slow*.

<sup>6</sup> Richard Thaler and Cass Sunstein, *Nudge: Improving Decisions About Health, Wealth, and Happiness* (New Haven: Yale University Press, 2008).

<b>Help people make concrete plans</b>	Helping people create concrete plans with discrete, manageable tasks increases the likelihood of follow-through.
<b>Offer feedback*</b>	Providing feedback allows users to understand where they are in a process and whether there are actions they need to take.
<b>Establish smart default settings*</b>	Thoughtful defaults harness people's tendency toward inertia in ways that support better outcomes (as defined by the choice architect).
<b>Deploy visual cues*</b>	Color coding, icons and other visual cues help focus users' attention where it's needed most.
<b>Support follow-through*</b>	Reminder text messages and other prompts can help keep users on track toward their goals.

\* Denotes a nudge: discrete, targeted interventions that choice architects can use to proactively support effective decision making. Nudges provide users needed information, reminders, etc. so that they can make choices best aligned with their interests.

**Expect Error**

Humans make mistakes, and choice architects plan with this tendency in mind. “A well-designed system expects its users to err and is as forgiving as possible,” write Thaler and Sunstein.<sup>7</sup> Examples of products and processes designed to anticipate user error abound. For instance, your email program asks if you’ve forgotten your attachment before sending. Your car beeps when you neglect to fasten your seatbelt and your gas cap is probably attached to the tank, so that you don’t drive away with the cap on the roof of the car. By designing for how people actually behave rather than the ideal situation, choice architects can help mitigate the negative consequences of a misstep.

**Meet People Where They Are**

Proactive outreach is a critical component of effective choice architecture. By meeting people where they are, in places they already frequent, choice architects can reduce the amount of work people must do to gather information and take action. For example, in one study researchers mailed letters to two groups of Medicare recipients about switching to lower-cost prescription drug plans. One group received personalized information in a simple table format that compared their current plan to other options. This approach let them easily see the potential savings they might gain from changing plans. The control group, by contrast, received letters directing them to a website where they could find more information. Ultimately, 28 percent of seniors who received the customized letters switched to lower-cost drug plans, while only 17

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<sup>7</sup> Richard H. Thaler, Cass R. Sunstein, and John P. Balz, “Choice Architecture” (2010). Available at <https://ssrn.com/abstract=1583509> (accessed Dec. 5, 2016).

percent of those advised to visit the website made any change, despite the fact that doing so was in their best financial interest. By proactively delivering customized, relevant content through a medium often used by the target audience, meeting people where they are increases the effectiveness and reach of behavioral science-informed interventions.<sup>8</sup>

### **Simplify Information**

Humans are more likely to become overwhelmed when complexity increases. The greater the number and type of choices we encounter, the more difficult it becomes to make a good decision. It's as if our brains are computer operating systems bogged down by too many programs and applications running at once. Simplifying information reduces these stresses by making it easier for people to understand their options and choose wisely. University of Virginia professor Ben Castleman argues that simplified and well-presented information “can reduce the cognitive attention [people] have to allocate and increase the likelihood that they make active and informed decisions.”<sup>9</sup>

### **Make Processes Easy to Navigate**

User experience (UX) design lets intentional choice architects create more easily navigated processes. TurboTax, for instance, helps people complete their taxes with a user-friendly interface that breaks the process into manageable steps. The program guides users through each question one at a time, with live chat assistance available if needed. This attention to the user journey makes for a process that is easier to navigate and, by extension, more likely to be completed.

### **Help People Make Concrete Plans**

Developing a specific plan of action has been shown to alleviate the effects of two common cognitive challenges: *present bias* and the *planning fallacy*. Present bias leads people to “overvalue immediate benefits at the expense of future ones.” This tendency, common to everyone, “is why it is hard to save, to go to the gym, or to do your taxes early.”<sup>10</sup> The planning fallacy, meanwhile, leads us to chronically underestimate the time it will take to complete a task. Choice architecture can counter these tendencies by helping people create concrete plans with discrete, manageable tasks. For instance, mobile app Eat This Much simplifies eating better by generating weekly meal plans and grocery lists based on user preferences. Easy-to-follow recipes indicate required prep time and cook time so that users can plan more effectively. Similarly, a trainer might help a client counteract present bias by helping her create a weekly workout schedule with details on the various exercises she'll complete each time. With clear action plans in place, people are much more likely to do what is necessary to achieve their goals.

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<sup>8</sup> Ben Castleman, *The 160-Character Solution: How Text Messaging and Other Behavioral Strategies Can Improve Education* (Baltimore: Johns Hopkins University Press, 2015), 30-31.

<sup>9</sup> Castleman, *The 160-Character Solution*, 24.

<sup>10</sup> Sendhil Mullainathan and Eldar Shafir, *Scarcity: Why Having Too Little Means So Much* (New York: Picador, 2013), 114.

## **Offer Feedback**

A savvy choice architect knows that the best way to enhance human performance is to provide feedback. Thaler, Sunstein and Balz offer the example of a digital camera, which provides instant visual feedback every time you take a shot. That information lets you compose a stronger image than you might be able to with a traditional film camera--all without having to develop the film to see the results. A number of industries make use of feedback in product design. For example, cars now come loaded with feedback devices, including alarms that warn of a low gas tank or a malfunctioning engine. Feedback lets people know whether or not they are on track and can serve as a well-timed nudge in the right direction.<sup>11</sup>

## **Establish Smart Default Settings**

When confronted with a decision, people often choose the path of least resistance and maintain the status quo. Rather than fight against this tendency, intentional default settings harness the power of inertia to support better decision-making and promote better outcomes. For example, studies have shown that the number of employees enrolled in 401(k) plans increases significantly when people have to opt out rather than opt in. Opting out requires an additional step, which decreases the likelihood that employees will decline to participate. Similarly, states have increased the number of organ donors by requiring driver's license holders to opt out. Thoughtfully designed defaults nudge people toward positive outcomes while still allowing them to make their own decision.<sup>12</sup>

## **Deploy Visual Cues**

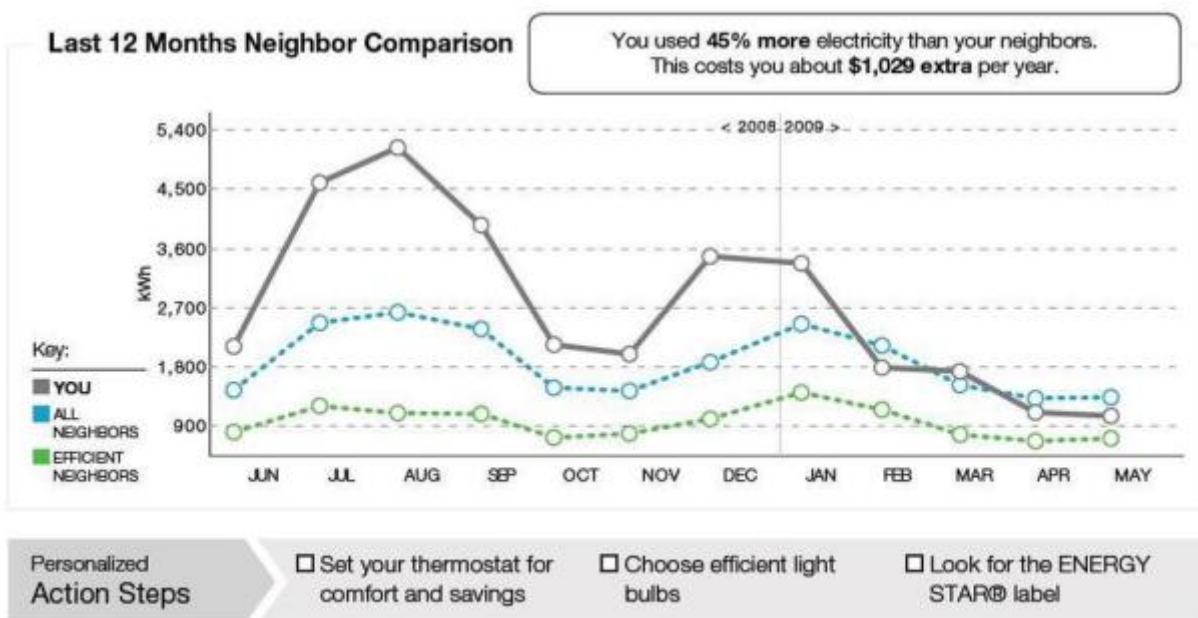
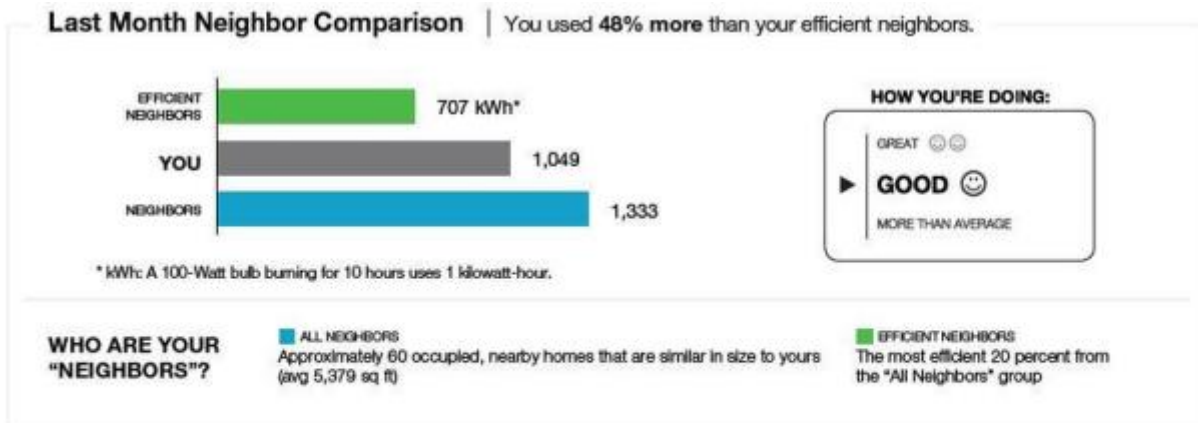
Clear visual cues attract attention and highlight information that might otherwise be overlooked. For instance, Opower--a cloud-based customer engagement platform for the energy industry--issues customer reports that use emoji to show homeowners how their energy use compares to that of their neighbors. A smiley face signals a job well done; a frowning face tells customers that they are consuming more energy than their neighbors. In presenting information about neighbors' energy use, Opower also mobilized the power of social pressure to encourage consumers to reflect on their energy consumption. Opower estimates that this intervention saved roughly eight Terawatt hours of energy, totaling \$1 billion in utility costs. Thoughtful use of color, visual representations of information and other graphic elements draw the eye and help nudge people toward better decisions.<sup>13</sup>

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<sup>11</sup> Thaler et al, "Choice Architecture."

<sup>12</sup> Castleman, *The 160-Character Solution*, 47.

<sup>13</sup> Robert Hahn and Robert Metcalfe, "The Impact of Behavioral Science Experiments on Energy Policy," (June 29, 2016); Opower, "As of today, Opower's clients have saved their customers \$1 billion on their energy bills," Opower blog, May 21, 2015. Available at <https://blog.opower.com/2015/05/billion-dollar-impact/> (accessed Dec. 1, 2016).



This Opower utility bill makes use of a variety of visual cues that direct the reader's attention to the most critical information.

Source: CNET, "Home Energy Displays Show You the Juice." Available at <https://www.cnet.com/pictures/home-energy-displays-show-you-the-juice-photos/8/>.

### Support Follow-Through

Reminder text messages and other prompts can encourage people to follow through on their plans. The best cues connect future goals to in-the-moment choices and nudge people toward decisions in line with those intentions. Prompts can also create a sense of urgency in order to increase the likelihood of action. For example, a number of universities--including the University of Virginia and the University of Pittsburgh--have used text message reminders about financial aid deadlines to nudge students to prioritize completing the form by the due date. By bringing important information to light and spurring people to take action on critical tasks, follow-through prompts can help people stay on top of multi-step processes and make progress toward their goals.



## Choice Architecture in Action

Choice architecture offers proven applications in a wide range of fields. By intentionally structuring people's decisions, it has measurably improved outcomes and in some cases saved lives.

### White House Social and Behavioral Sciences Team

Fewer than half of U.S. military service members take advantage of the federal government's retirement savings plan, the Thrift Savings Program (TSP). As a result, they miss out on important benefits designed to help them save for the future. Concerned by persistently low levels of participation, the White House's Social and Behavioral Sciences Team (SBST) partnered with the Department of Defense to test whether behavioral interventions could help boost military participation rates in the TSP program.

The effort began by **supporting follow-through** - with an email reminding military members about the TSP program and encouraging them to sign up. This intentionally designed nudge nearly doubled the rate of enrollment and ultimately led to more than \$1 million in new retirement savings over the course of a single month.

Next, the SBST piloted a redesigned TSP enrollment form that **simplified information** and made the enrollment process **easier to navigate**. After the redesign, TSP enrollment rates rose more than eight percent.<sup>14</sup>

**II. CHOOSE THE AMOUNT OF YOUR CONTRIBUTIONS**

Your choice will cancel all previous elections:

YES. I choose to enroll and save

NO. I choose not to enroll and save (Put 0's in 7-14)

I'm already enrolled (Leaves 7-14 blank)

To start or change the amount of your contributions, enter in Items 7-10 the percentage of your pay each pay period that you want as traditional (pre-tax) contributions. Enter in Items 11-14 the percentage of your pay each pay period that you want as Roth (after-tax) contributions. **Note:** You **must** elect to contribute at least 1% of basic pay (or its equivalent) to be eligible to contribute from your other types of pay (see instructions). **Remember:** A blank line next to a type of contribution equals 0% contributed.

Traditional (Pre-Tax) Contributions All Services			Roth (After-Tax) Contributions All Services		
Basic Pay	7.	_____ .0%	11.	_____ .0%	
Incentive Pay	8.	_____ .0%	12.	_____ .0%	
Special Pay	9.	_____ .0%	13.	_____ .0%	
Bonus Pay	10.	_____ .0%	14.	_____ .0%	

*The box on the left side of the form requires military personnel to choose whether to participate in a savings plan. The yes / no options subtly reinforce that choosing no means a missed opportunity to save.*

### Consumer Financial Protection Bureau

On any given day, there are more than 500 million credit cards in use in the United States and credit card debt among Americans stands at roughly \$700 billion. But two-thirds of cardholders report that they don't fully understand how their cards work. Credit card companies often use a more nefarious type of choice architecture when designing customer statements, burying key information about interest rates, fees, billing and payments in pages of fine print. This

<sup>14</sup> National Science and Technology Council, "Social and Behavioral Science Team Annual Report" (September 2016), 3-4.

presentation of information benefits the companies, which profit when cardholders underestimate the cost of compounding interest, missed payment fees and other factors.

According to the Consumer Financial Protection Bureau (CFPB), confusion over credit card terms contributes to many consumer complaints. In response, the CFPB piloted a dramatically streamlined credit card agreement designed to help people sort through complex financial information quickly and easily. The revised agreement **simplified information** and presented need-to-know details in a clear, easy-to-read format. It also uses **visual cues** such as color blocks and numbered sequences to make the information **easier to navigate**.<sup>15</sup>

## Welcome to ABC Bank.

You'll find the terms of your credit card here.  
It's a contract that starts as soon as you sign or use the card.

For each underlined word or phrase, the definition in the Consumer Financial Protection Bureau Definition of Credit Card Terms is part of your contract.

These definitions are available at [www.cfpb.gov](http://www.cfpb.gov) or [www.abcbank.com](http://www.abcbank.com). Or call 1-800-xxx-xxxx for a free printed copy.

### 1. Costs

You may use your card for purchases, cash advances, or balance transfers. Each type of charge will have its own balance. Each balance may have a separate interest rate.

#### What are the charges?

Interest rate for [period] on <u>purchases</u>	X% <u>APR</u> → Interest rate after [period] on <u>purchases</u>	X% <u>APR</u>
Interest rate on <u>balance transfers</u>	X% <u>APR</u> + <u>Balance transfer fee</u> (per transaction)	X%
Interest rate on <u>cash advances</u>	X% <u>APR</u> + <u>Cash advance fee</u> (per transaction)	X%
Penalty interest rate	X% <u>APR</u> <u>Late payment fee</u>	\$X/\$Y
<u>Returned payment fee</u>	\$X	<u>Rush card fee</u> \$X
<u>Replacement card fee</u>	\$X	<u>Foreign currency transaction fee</u> X%

Your APRs are variable, except [excluded rates]. They increase or decrease with the prime rate. From the [day] of each billing period, we apply APRs based on the prime rate published x business days before the end of that period. To determine your APRs we add to the prime rate: x percentage points for purchases after [period], x percentage points for balance transfers, x percentage points for cash advances, and x percentage points for the penalty interest rate.

*CFPB's streamlined credit card agreement form simplifies complex information and provides visual cues that steer the reader's attention to critical details.*

The CFPB's revised form contained just 1,100 words, a considerable improvement on the 5,000 words found in a typical credit card agreement. "With a short, simple, easy-to-understand credit

<sup>15</sup> Consumer Financial Protection Bureau, "CFPB Aims to Simplify Credit Card Agreements" (Dec. 7, 2011). Available at <http://www.consumerfinance.gov/about-us/newsroom/consumer-financial-protection-bureau-aims-to-simplify-credit-card-agreements/> (accessed Dec. 5, 2016); Consumer Financial Protection Bureau, "Know Before You Owe: Credit Cards." Available at <http://www.consumerfinance.gov/credit-cards/knowbeforeyouowe/> (accessed Dec. 5, 2016).

card agreement,” asserted former CFPB deputy director Raj Date, “consumers can clearly see the terms of the deal and make the decisions that are right for them.”<sup>16</sup>

### **Life-Saving Checklists**

In *The Checklist Manifesto: How to Get Things Right*, surgeon and public health researcher Atul Gawande advocates for a simple but powerful tool of choice architecture: the checklist. Checklists can help people **navigate complicated processes** by mapping out key tasks to be accomplished. Gawande argues that the level of detail and complexity that surgeons, pilots, CEOs and other professionals face each day in the workplace makes it difficult for even the most highly trained specialist to avoid making a mistake at least once in a while. Checklists address this challenge by helping people manage complexity, which in turn makes human error less likely.<sup>17</sup>

Gawande’s study was inspired by the efforts of Peter Pronovost, a critical-care specialist at Johns Hopkins Hospital. Pronovost instituted a 5-point checklist for starting intravenous lines that reduced ICU patients’ likelihood of contracting a secondary infection. After instituting the checklist, the hospital’s 10-day infection rate dropped from 11 percent to zero. In the 15 months that followed, Pronovost’s checklist prevented 43 infections, spared eight lives and saved \$2 million. Impressed by these results, Gawande and his surgical team created a safe surgery checklist that they have since shared with healthcare providers throughout the world.<sup>18</sup> A broad range of other fields use checklists as well in order to reduce cognitive burden and help ensure that critical tasks are completed.

### **Choice Architecture and the Transition to Postsecondary School**

Thoughtful choice architecture can help students navigate the complicated transition from high school to college just as it helps people navigate decisions in other arenas. At a time when a single misstep may trigger far-reaching negative consequences, well-designed choice architecture can measurably benefit students and their families.

Any time of significant transition can trigger a sense of disorientation. Fortunately, it is in these moments that behavioral interventions can be most effective, according to University of Virginia professor Ben Castleman. In his study *The 160 Character Solution: How Text Messaging and Other Behavioral Strategies Can Improve Education*, Castleman urges greater attention to these

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<sup>16</sup> Consumer Financial Protection Bureau, “CFPB Aims to Simplify Credit Card Agreements,” (December 7, 2011). Available at <http://www.consumerfinance.gov/about-us/newsroom/consumer-financial-protection-bureau-aims-to-simplify> (accessed Nov. 28, 2016).

<sup>17</sup> Atul Gawande, *The Checklist Manifesto: How to Get Things Right* (New York City: Henry Holt and Company, 2009).

<sup>18</sup> For more on Pronovost’s work, see Peter Pronovost and Eric Vohr, *Safe Patients, Smart Hospitals: How One Doctor’s Checklist Can Help Us Change Health Care from the Inside Out* (New York City: Plume, 2011).

critical junctures in students' educational trajectories, when the stakes are especially high and the costs of poor decision-making even higher.<sup>19</sup>

In the United States, elementary school, middle school, and typically most of high school are compulsory.<sup>20</sup> The K-12 pathway is clearly laid out and families face a limited number of options at each juncture. As a result, there's typically little doubt that students will continue their education along the prescribed pathway.

But the transition from high school to postsecondary education poses a much more complex challenge. Statistically the greatest number of students leave the educational system after high school graduation. High school seniors face unknown territory as they take their first steps into young adulthood. In the course of a few short months, they must complete their college entrance exams, decide where to apply and complete applications for schools and federal financial aid. Then, a short time later, they must choose which institution to attend, determine how to pay for school and begin the process of enrollment and registration. For students who are first in their family to attend college, this time can be even more fraught because they must navigate this process without the benefit of family members' past experience.

The complexity of the college application process places a heavy cognitive burden on students, demanding substantial mental energy and attention. Students must take college entrance exams, secure letters of recommendation, draft personal statements and writing samples, and have their transcripts sent to the appropriate schools. Unfortunately, their still-developing brains are poorly suited to cope with this burden. In several studies, neuroscientists have found that the "executive control" center of the student's brain--the part that regulates decision-making and reasoned judgement--isn't fully developed by late adolescence. "The parts of adolescents' brains which reply to immediate stimuli are firing on all cylinders," explains Castleman, "while the regions required for careful deliberation, thorough reasoning and judgment are just coming off the assembly line."<sup>21</sup>

The overwhelmed young person attempting to navigate the transition from high school to college is vulnerable to what behavioral economists Sendhil Mullainathan and Eldar Shafir refer to a scarcity mindset. In their book *Scarcity: Why Having Too Little Means So Much*, Mullainathan and Shafir found that people often develop tunnel vision when pushed to the cognitive limit by competing priorities and high-pressure decisions. The resulting present bias leads people to prioritize immediate needs over long-term considerations and makes complex choices even more difficult. The scarcity mindset can lead people to make poorly informed decisions or delay making long-term plans entirely--even when they know it is not in their best

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<sup>19</sup> Castleman, *The 160 Character Solution*.

<sup>20</sup> In the United States, students must attend school until age 16 - 18, depending on the state. National Center for Education Statistics, "Table 5.1. Compulsory school attendance laws, minimum and maximum age limits for required free education, by state: 2015." Available at [https://nces.ed.gov/programs/statereform/tab5\\_1.asp](https://nces.ed.gov/programs/statereform/tab5_1.asp) (accessed Dec. 6, 2016).

<sup>21</sup> Castleman, *The 160-Character Solution*, 24.

interest.<sup>22</sup> In this case, the result can be failing to apply for essential financial aid or undermatching (i.e., highly qualified students enrolling in less selective institutions).

The scarcity mindset disproportionately affects lower-income households, where the pressures of getting by day-to-day consume a great deal of cognitive capacity. Family responsibilities, after school jobs, and other factors can further restrict a student's cognitive bandwidth. As a result, the high school to college transition represents an even greater challenge for low-income and/or first generation college-going students.

## **Applications of Choice Architecture in the Transition from High School to Postsecondary**

No one entity structures the process of moving students from high school to college. ACT and the College Board administer college admissions exams. The federal government handles the FAFSA application process, while the College Board's CSS PROFILE application lets students access non-federal aid that some schools offer. Each school has its own admissions criteria and each decides how much financial aid to offer students each year. Although almost 700 schools now accept the Common Application, they each have their own deadlines and may require supplemental materials in addition to the application. The lack of coordination among these and other processes is a recipe for poor student outcomes.

Intentional choice architecture can help remedy this situation by simplifying information, meeting students where they are, making processes easier to navigate and providing nudges to support follow-through. The examples that follow highlight how different organizations are using choice architecture to help students stay on track through the application process and into the next stage of their academic career.

### **Saving for College**

All too often, students from low-income families mistakenly believe that they will not be able to afford college. Many are unaware of financial aid options, scholarship opportunities and other supports that could make a college degree an achievable goal. In addition, students lack familiarity with the process of applying to schools, which makes it even less likely that they will navigate the process successfully.

San Francisco startup **Raise.me** aims to remedy these information shortfalls by helping students understand the college application and financial aid process well before their senior year. As early as ninth grade, participating high school students can earn "micro-scholarships" that can be used at 180 colleges and universities across the country. For example, a student can bank \$100 for completing an advanced placement course or \$250 for visiting a college

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<sup>22</sup> Mullainathan and Shafir, *Scarcity*.

campus. Each participating college sets its own award criteria, with some institutions actively seeking out lower-income students by offering micro-scholarships for caring for a sibling or holding a job. Each micro-scholarship earned acts as a nudge to stay on track in school, while the money students earn through the program helps dispel concerns about the cost of college. Through careful application of a number of choice architecture principles--including **simplifying information, making processes easier to navigate** and providing nudges to **encourage follow-through**--Raise.me connects students' present-day decisions to their future goals and helps them to apply to college.<sup>23</sup>

### **Reducing Undermatching**

High-achieving, low-income high school seniors are likely to undermatch, meaning that they apply to postsecondary institutions that are less selective than their merits qualify them to attend. Only 34 percent of high-achieving low-income students attend a selective school, compared with 78 percent of their academic peers from upper-income background.<sup>24</sup>

Researchers Carolyn Hoxby and Sarah Turner point to a lack of information as a key source of this problem. High-achieving low-income students are less likely to be aware of opportunities available to them at more selective schools. These students often do not attend school with a cohort of other high achievers and tend to be geographically isolated from higher-income peers at better resourced schools. Their high school counselors may lack the time and expertise to guide them through the process of identifying and applying to selective colleges. Visits by college admissions staff are rarer and students seldom encounter individuals who attended more selective institutions. As a result, many of these students lower their sights and apply to less selective schools that often have less financial aid available than more prestigious institutions. In so doing, they miss out on the benefits that more selective schools can confer, including stronger professional and alumni networks and higher lifetime earnings.

In an effort to redress this disparity, Hoxby and Turner designed an RCT intervention predicated on thoughtful choice architecture. They partnered with the College Board to identify low-income students scoring in the top 10 percent of SAT exam takers nationwide and sent customized information packets to more than 39,000 of these students. The packets contained details about schools likely to accept them based on their SAT scores, including information on institutional quality, cost and the student's potential financial aid package. To help students get a complete picture of their options, Hoxby and Turner provided similar information on in-state community colleges and four-year schools. The packets also included an application fee waiver to reduce the likelihood that upfront costs would deter students from applying. The control group received no intervention.

Hoxby and Turner's RCT had a positive impact on student decisions. High achievers who received the customized information were more likely to apply for and attend colleges with higher graduation rates, more robust academic offerings, greater resources, more financial aid and better-prepared peers. The freshman academic performance of those who received the

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<sup>23</sup> Natasha Singer, "Got an A in Algebra? That's Worth \$120," *New York Times*, February 20, 2016.

<sup>24</sup> Castleman, *The 160-Character Solution*, 50.

intervention matched that of the control group, despite the fact that those in the control group ended up attending less competitive colleges.<sup>25</sup>

This choice architecture intervention **met students where they were** and provided **simplified information** and **follow-through support** to raise awareness of postsecondary opportunities. Equipped with relevant information, students were able to make decisions that more closely aligned with their best interests.

### **Advising via Text**

Many high school students aspire to earn a college degree but without consistent guidance and support, they often fail to realize this goal. As Castleman notes, “A vague recognition of the benefits of college--especially when those benefits accrue many years in the future--is often not sufficient to catalyze independent action to complete application-related tasks.”<sup>26</sup> These tasks demand sophisticated organizational and planning skills that may not exist in the growing adolescent brain. Outside support can help mitigate these challenges, but all too often schools have high counselor-to-student ratios that make it difficult for students to get the college planning help they need.

Boston-based **AdmitHub** aims to address this advising gap with its text-based chatbot named Oli.<sup>27</sup> Using artificial intelligence and machine learning, Oli guides students through each step of the college application process. Students drive the conversation, but Oli provides well-timed behavioral nudges and reassuring messages to encourage follow-through. In tune with millennial expectations, Oli requires no app, no login, no password and no payment and is available 24/7. By engaging teens via text--a preferred means of communication for many in this age group--the chatbot delivers timely information that to support students’ journey towards to college.

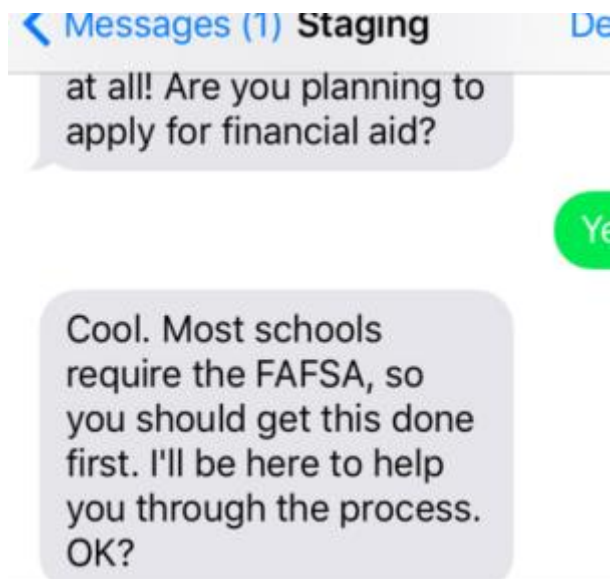
When students need personalized assistance, Oli puts them in touch with relevant college staff who can field their questions. The bot reduces the amount of time admissions staff devote to responding to repetitive questions about deadlines and logistics, freeing them to turn their attention to more complicated student requests.

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<sup>25</sup> Hoxby, Caroline and Sarah Turner. “Expanding College Opportunities for High-Achieving, Low Income Students.” Stanford, CA: Stanford Institute for Economic Policy Research, 2013. Available at <http://eml.berkeley.edu/~saez/course131/Hoxby-Turner13.pdf> (accessed Dec. 1, 2016).

<sup>26</sup> Castleman, *The 160-Character Solution*, 25.

<sup>27</sup> Not to be confused with Carnegie Mellon University’s Open Learning Initiative (OLI).



AdmitHub has launched customized admissions chatbots to shepherd new students through the enrollment process. The first of its university-specific projects was Georgia State University's "Pounce" bot. **Pounce** supplements GSU's innovative, data-driven approach to boosting student enrollment, retention and success rates by providing a way to actively engage incoming freshmen. AdmitHub reports that 71 percent of admitted students exchanged texts with Pounce during its first few months, getting on-demand answers to questions about the registration process, campus building locations and other subjects. Students rated the chatbot highly, with one commenting, "I liked how convenient it was. I didn't have to look through my emails. I just went to my text."<sup>28</sup>

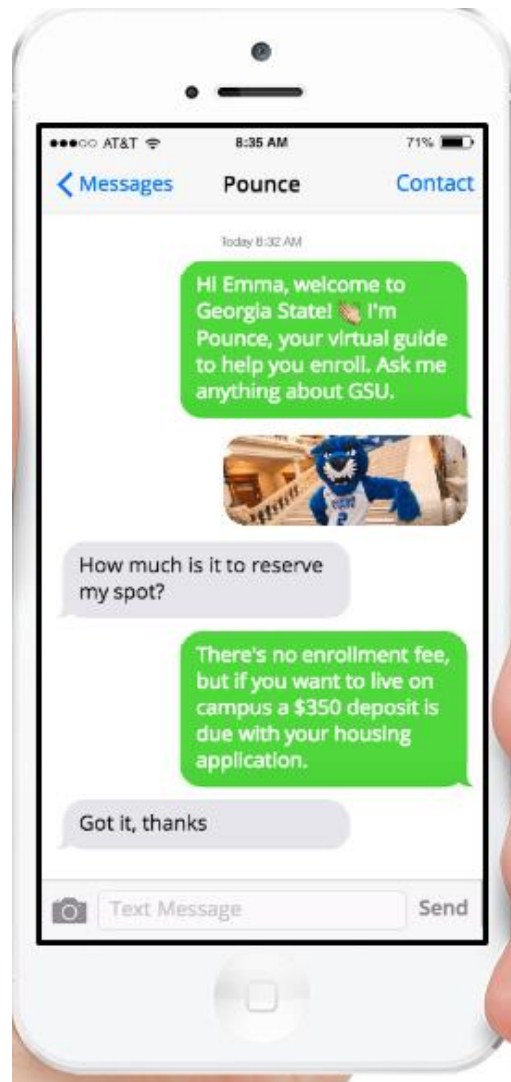
Of the 50,000-plus student messages received by Pounce in a single month, fewer than one percent required follow-up by GSU staff. Scott Burke, the GSU assistant vice president for undergraduate admissions, said that the early results of the Pounce initiative "exceeded my wildest expectations" in helping the university achieve its enrollment goals.<sup>29</sup> The GSU pilot, which focused on incoming freshmen, was a key factor in a one-year 22% reduction in summer melt (students who are admitted but fail to enroll) among Georgia State's incoming students. As of November 2016, four more institutions have announced plans for their own chatbots and GSU is launching a project to deploy the system to support students once enrolled.

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<sup>28</sup> Kirk Daulerio, "Engaging Students with Chatbots: A Rising Tide," AdmitHub blog, November 10, 2016. Available at <http://blog.admithub.com/engaging-students-with-chatbots-a-rising-tide> (accessed November 28, 2016).

<sup>29</sup> Dan Peterson, "AdmitHub Launches First College Chatbot with Georgia State," AdmitHub blog (May 17, 2016). Available at <http://blog.admithub.com/admithub-launches-first-college-chatbot-with-georgia-state> (accessed Nov. 28, 2016).





Oli and Pounce help students find their way through the complex array of tasks involved in starting college. The chatbots' text message reminders provide targeted nudges that meet teens where they are by using their preferred mode of communication.

### **Making Financial Aid Packages Understandable**

The net cost of attending a particular college can be difficult for students and families to determine. Educational institutions provide information on tuition, fees and financial aid packages in a wide range of formats, some of which are easier to understand than others. The Financial Aid Shopping Sheet reduces this unnecessary complexity by making the net cost of attendance visible at a glance. Created through a partnership between the CFPB and the U.S. Department of Education, the sheet outlines the full price of attending a particular school for one year, including tuition fees, housing, meals, books and supplies, transportation and other costs as well as scholarships, loans and other aid for which they qualify, details on work-study options and suggested borrowing amounts. In addition, it provides a quick read on institutional quality, with graphics displaying the school's graduation, loan default and student borrowing rates.

More than 2,900 U.S. institutions now use the shopping sheet to deliver financial information to prospective students and their families. By **simplifying information** and making **use of visual cues**, the Financial Aid Shopping Sheet makes possible an apples-to-apples comparison of different institutions so that students choose the school that best meets their needs.

MM / DD / YYYY

**University of the United States (UUS)**  
Student Name, Identifier

[Download](#)

**Costs in the 2014-15 year**

**Estimated Cost of Attendance** \$X,XXX / yr

Tuition and fees	\$ X,XXX
Housing and meals	X,XXX
Books and supplies	X,XXX
Transportation	X,XXX
Other education costs	X,XXX

**Graduation Rate**

Percentage of full-time students who graduate within 6 years

XXX%

Low
Median
High

**Grants and scholarships to pay for college**

**Total Grants and Scholarships** ("Gift" Aid; no repayment needed) \$X,XXX / yr

Grants and scholarships from your school	\$ X,XXX
Federal Pell Grant	X,XXX
Grants from your state	X,XXX
Other scholarships you can use	X,XXX

**Loan Default Rate**

Percentage of borrowers entering repayment and defaulting on their loan

XXX%

This Institution

XXX%

National

**What will you pay for college**

**Net Costs** \$X,XXX / yr

(Cost of attendance minus total grants and scholarships)

**Median Borrowing**

Students who borrow at UUS typically take out \$X,XXX in Federal loans for their undergraduate study. The Federal loan payment over 10 years for this amount is approximately \$X,XXX per month. Your borrowing may be different.

\$

**Options to pay net costs**

**Work options**

Work-Study (Federal, state, or institutional) \_\_\_\_\_ \$ X,XXX

**Loan Options\***

Federal Perkins Loan	\$ X,XXX
Federal Direct Subsidized Loan	X,XXX
Federal Direct Unsubsidized Loan	X,XXX

\*Recommended amounts shown here. You may be eligible for a different amount. Contact your financial aid office.

**Repaying your loans**

To learn about loan repayment choices and work out your Federal Loan monthly payment, go to: <http://studentaid.ed.gov/repay-loans/understand/plans>

**Other options**

**Family Contribution** \$X,XXX / yr

(As calculated by the institution using information reported on the FAFSA or to your institution.)

- Payment plan offered by the institution
- Military and/or National Service benefits
- Parent or Graduate PLUS Loans
- Non-Federal private education loan

**For more information and next steps:**

**University of the United States (UUS) Financial Aid Office**

123 Main Street  
Anytown, ST 12345  
Telephone: (123) 456-7890  
E-mail: financialaid@uus.edu

*The Financial Aid Shopping Sheet, now in use by more than 2,900 institutions nationwide, clarifies the cost of college attendance.*

## Combatting Summer Melt

Financial hurdles and other obstacles lead a sizable number of recent high school graduates to abandon their college-going intentions before they even set foot on campus. This challenge, known as summer melt, affects thousands of students each year. Researcher Ben Castleman found that 20 percent of college-bound high school graduates in Boston failed to enroll in the fall. In Fort Worth, Texas, that number rose to more than 40 percent.

A variety of factors make summer melt more likely to occur. For many low-income students, summer is a busy time of major responsibilities. Many hold down jobs while shouldering family obligations such as care for younger siblings and translating for non-English-speaking parents. These duties tax the cognitive bandwidth of even the most conscientious students. As a result, complex tasks such as evaluating financial aid packages, completing loan applications, finalizing enrollment forms and taking academic placement tests become that much more difficult to complete. The scarcity mindset takes over and students begin to succumb to summer melt.

To combat summer melt, Castleman designed an intervention using a series of text messages to act as “behavioral multivitamins.”<sup>30</sup> Weekly reminders customized with information about the student’s intended college prompted participants to finalize financial aid awards, register for freshman orientation and tackle other key tasks. The text messages included URLs so that students could address critical to-do items immediately. As Castleman reports in *The 160-Character Solution*, this intervention “consistently [led] to increased enrollment among students” mostly likely to suffer from summer melt.<sup>31</sup>

The summer melt text message intervention cost less than \$10 per student and provided a sizable return on investment for students and schools alike. It made college enrollment easier for students to navigate by **simplifying information**, and **helping them to make concrete plans** by highlighting deadlines and outlining sequential steps. In addition, the targeted texts functioned as nudges that kept students from fall victim to summer melt.

### **Using Predictive Analytics to Power Choice Architecture**

Atlanta’s GSU is home to more than 33,000 students. In 2003, its graduation rate stood at 32 percent and its underserved populations fared even worse. African American students graduated at a rate of 29 percent and Latino students had a mere 22 percent graduation rate. In addition, graduation rates among Pell students (a common proxy for lower income) lagged far behind those of their non-Pell classmates.

To remedy this situation, GSU embraced the widespread use of predictive analytics and has made remarkable progress in boosting its academic success over the past 13 years. As of 2015, GSU’s graduation rate had risen to 54 percent, with underserved students making even greater gains. The graduation rate climbed to 54 percent for Latino students and 57 percent for African American undergraduates, rates slightly higher than those of white students. Pell-eligible students at GSU now graduate at rates equal to those of non-Pell students. In short, GSU has erased its achievement gaps.

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<sup>30</sup> Castleman, *The 160-Character Solution*, 79.

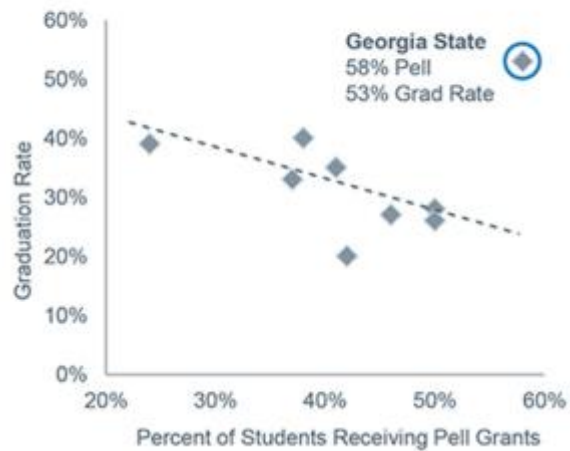
<sup>31</sup> Castleman, *The 160-Character Solution*, 25.

### Moving the Dial on Graduation Outcomes



### Outperforming Peers With Low-Income Students

Graduation and Pell Rates of Urban Research Universities



Georgia State's adoption of a student advising system that makes use of choice architecture elements improved student outcomes and erased the achievement gap.

Source: EAB, "How Georgia State University used data-driven interventions to add \$3M in tuition revenue" (Feb. 15, 2015).

In implementing this new approach, GSU used 10 years' worth of data on past and current student achievement to identify a wide range of key indicators and barriers to student success. In 2012, it launched its Graduation and Progression System (GPS), which closely tracks student progress by monitoring over 800 factors related to their success. These range from a low grade in a pre-requisite course to enrollment in a class that doesn't count toward the student's major. GPS nudges advisors to contact students proactively so that they can address potential problems before they become unmanageable. In just one academic year, GPS alerts resulted in more than 51,000 one-on-one meetings between students and advisors and the university has seen a five-point increase in freshman fall-to-spring retention and a 5.2 percentage point increase in four-year graduation rates since launching the system.

GSU also used choice architecture to improve the process of selecting courses and majors. Instead of choosing from 90 different majors and 3,000 courses, GSU **established smart default settings** and now asks incoming freshmen to select one of seven meta majors--STEM, business, arts and humanities, policy, health, education and social sciences. Incoming students can explore the meta-majors through a personalized online portal even before arriving on campus. Once the student makes her decision, the course enrollment system pre-populates her schedule for the year with a set of default courses relevant to the meta-major that also fulfill graduation requirements. This redesigned process reduced the number of students changing their majors by 32% over a two-year period. Due in part to these changes, the average time to degree for GSU graduates has declined by more than half a semester per student, saving the graduating class of 2016 approximately \$15 million in tuition and fees when compared to the

class of 2013. In addition, it has decreased the number of undersubscribed courses, allowing the university to increase efficiency and deploy resources more effectively.

GSU's thoughtful use of choice architecture helped increase the effectiveness of student onboarding and advising. The school's holistic approach to supporting student success helps students map out a concrete plan for their studies while also making the college experience easier to navigate.<sup>32</sup>

## Conclusion

Choice architecture brings the insights of behavioral economics to bear on the process of making a decision. At its best, it provides structure to support effective decision making in complicated situations, including the transition from high school to postsecondary. It offers a way to mitigate the effects of System 1 thinking, the planning fallacy, present bias and other innate behaviors that are common to all. It accounts for human fallibility by helping people navigate complex processes and make and follow through on plans. It provides mechanisms to nudge people toward smarter choices.

Those working in the field of education would do well to consider how interventions developed for other sectors might inform better choice architecture in an academic setting. Adapting existing use cases for different industries is an expedient route to innovation that makes the most of lessons learned along the way. Its applications are numerous and will only continue to grow as choice architects deepen their knowledge and expand their toolkit of interventions.

During the Global Good session, we will delve further into the ideas and examples presented here. We will look at the evolution of the field, explore key concepts and walk through products that use choice architecture to smooth students' transition to college. We hope that the expert speakers and product demos during the session will spur discussion around ways that choice architecture principles could be used to support student success.

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<sup>32</sup> Complete College Georgia, "Georgia State University 2015--Block Schedules-Meta-Majors/Learning Communities" (January 2016). Available at <http://www.completegeorgia.org/georgia-state-university-2015-block-schedules-meta-majorslearning-communities>.

## Product demos

The following is a list of some of the products that we will demo as part of the session:

[AdmitHub](#) works with colleges and universities to create customizable chatbots that use two-way text communication to connect students to information, deadline notifications, and support resources.

[CampusESP](#) is a web-based platform for parents of college students. It aims to "nudge the nudger" with reminders about key deadlines, tuition due dates, and other critical tasks. Parents can also pay tuition and track student course progress, financial aid status, and GPA.

[CampusLogic](#) helps schools make their financial aid award process easier and more understandable for students and parents. Its [AwardLetter](#) product helps schools design digital financial aid award letters that are easy to read, including visual cues to highlight critical info, definitions of key terms, and nudges to discourage excessive borrowing. Its [StudentForms](#) product lets schools put their financial aid application process online.

[Civitas](#) offers [Degree Map](#), a web-based degree-planning app that uses a school's degree audit system data to help students map out their postsecondary careers. Also lets students explore career pathways using Burning Glass data to determine skills needed, demand, and other key factors. Its [Schedule Planner](#) product is an online schedule builder that optimizes student course schedule options based on course needs and student time demands.

[College Source u.direct](#) is a web-based degree-planning app powered by degree audit system data that lets students create interactive maps of their postsecondary careers.

[EduNav](#) is a cloud-based system that uses degree audit data to create optimized real-time degree and schedule plans. Schools can choose to let students register directly through the EduNav system.

[Ellucian Degree Works](#) is a degree planning system that pulls from degree audit data to help students craft realistic plans to their degrees. It includes public-facing option so that prospective transfer students can see how their credits might articulate at the receiving school.

[GradGuru](#) is a mobile app that delivers targeted push notifications, reminders, and evidence-based nudges to support student planning and decision making.

[InsideTrack](#) offers [uCoach](#), a student engagement and coaching mobile app and web platform that integrates with the school's CRM, SIS, and LMS. It provides students support from their first day through to graduation. Automated nudges--delivered by text, email, and push notification--remind students of deadlines and events. Students can also message their coaches through the app or website.

# Glossary

## **Analytics**

Using large datasets to surface insights about a particular subject. Two commonly employed types of analytics are:

- *Learning analytics*: Analyzing student data in order to optimize and personalize educational experiences.
- *Predictive analytics*: Extracting insights from past and present datasets in order to predict future outcomes. Predictive analytics often serve as the “engine” powering choice architecture elements.

## **Choice architecture**

The intentional design of a decision that provides needed assistance while also taking into account how the human mind works and how its innate tendencies can be harnessed to produce better outcomes.

## **Cognitive load**

The level of mental activity required to power a person’s working memory. Greater choice complexity negatively affects cognitive load by placing a greater burden on the individual.

## **Dark patterns**

Self-serving choice architecture that uses behavioral insights to trick people into particular actions that do not necessarily have their best interests at heart.

## **Nudge**

A discrete, targeted intervention that choice architects can use to proactively support effective decision making. Nudges provide users needed information, reminders, etc. so that they can make choices best aligned with their interests.

## **Planning fallacy**

Human tendency to chronically underestimate how long a task will take to complete.

## **Present bias**

Human tendency to focus on the immediate term to the detriment of future outcomes.

## **Prompt**

Cues that connect future goals to in-the-moment choices and create a sense of urgency in order to increase the likelihood of action. Text message notifications, alerts, and other prompts can help people stay on top of multi-step processes and make progress toward their goals.

## **Scarcity mindset**

A frame of mind that stems from the struggle to make do with limited resources (e.g., time, money, cognitive bandwidth). This mindset reinforces present bias and makes it difficult to

navigate competing priorities and complex decisions. The likelihood of having a scarcity mindset grows as one's cognitive load increases.

**Smart default**

An intentionally designed default setting that aims to harness people's tendency toward inertia in ways that support better outcomes (as defined by the choice architect).

**System 1**

The brain's quick, emotional and impulsive side, also known as the Automatic System.

**System 2**

The brain's slow, methodical and deliberate side, also called the Reflective System.

**UX design**

User experience (UX) design aims to improve how a user interacts with a given product or process.

**Visual cue**

Color coding, icons, and other design elements that focus the viewer's attention.