



# Determinants of Academic Performance

A Behavioural Science Approach

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## Introduction

*The key to understanding how humans evolved and why we are so different from other animals is to recognize that we are a cultural species. Probably over a million years ago, members of our evolutionary lineage began learning from each other in such a way that culture became cumulative. That is, hunting practices, tool-making skills, tracking know-how, and edible-plant knowledge began to improve and aggregate— by learning from others— so that one generation could build on and hone the skills and know-how gleaned from the previous generation.*

*Joseph Heinrich*

*(The Secret of Our Success: How Culture is Driving Human Evolution)*

Passing our knowledge is key to our success. Human evolution is built on our ability to re-examine and write over the failures and successes of those who preceded us. To help the new generation acquire the accumulated knowledge, we put lots of energy into developing better ways to deliver content. Parents and teachers design programs, create evaluation methods and take advantage of technology to improve the learning process. However, that is only half of the story. Successfully acquiring knowledge does not depend exclusively on the supply-side.

After reviewing more than 1,200 studies in education, John Hattie concluded that twenty to twenty five percent of the variance in learning is a function of the teacher. Twenty-five to thirty percent is explained by school, principal, house and peers. However, the single most important factor in explaining the remaining 50 percent of variance in learning is what students bring to the classroom (Hattie, 2015). Students come to the classroom with their prior knowledge and background, their beliefs, their own motivational approach, and clear physical influences that make them unique decision makers.

Public policies in education and teaching practices focus heavily on the former factors: increasing teachers' quality, improving academic content and upgrading school premises. There is no doubt that those factors have a positive influence on academic performance, yet effectiveness will rely on the final decisions made by students. Learners face many big decisions that impact their academic performance: What should I learn? What do I need to learn first? How much effort should I put into learning this? How much do I need to know about it? These and many other less dramatic, commonplace decisions shape the learning process and determine its outcome.

This paper focuses on students as decision makers, using a Behavioural Science approach. Combining elements taken from psychology, neuroscience and economics, Behavioural Science dives into the specific mechanisms activated when humans make decisions. From that standpoint, it is possible to target the determinants that push students into poor decision-making processes, improving their academic performance.

Teachers and professors may find, in these behavioural insights, very powerful and cost-effective tools to improve students' decisions and have a positive impact on their academic performance. One of the key strengths of this approach is that behavioural interventions are extremely cost effective in relation to the resources involved in revamping traditional education policies.

Educators may try to improve their students' cognitive abilities in order to improve decision-making rationale, but every decision has a context that can derail rationality. Richard Thaler and Cass Sunstein coined the term *choice architecture* to refer to the act of "organizing the context in which people make decisions". Professors can turn themselves into choice architects of their own students' decisions by understanding the non-cognitive forces that shape them and by creating contexts that help students reach the best possible outcomes.

Four major non-cognitive factors overwhelmingly affect student decision-making processes in that last mile: (a) some students focus too much on the present, (b) some rely too much on routine, (c) some

focus too much on negative identities, and (d) mistakes are more likely with too little information or too many options. (Lavecchia, Oreopoulos, & Liu, 2015)

This paper gives professors a brief introduction to Behavioural Science concepts and presents some potential education interventions built with these concepts. Beginning with a brief description of the elements of decision-making from the perspective of Behavioural Sciences, the paper then explores the characteristics of the decision-making process of adolescents and young adults in relation to their studies. Finally, using the MINDSPACE (Dolan et al, 2010) framework, behavioural strategies to target the aforementioned non-cognitive factors are offered.

## How do we make decisions?

A brief overview of Behavioural Science's approach to the human decision-making process allows us to understand how students make their decisions and helps to explain how bad decisions are made. Exploring the ways context influences student decisions will help professors to anticipate where students may derail, giving educators the chance to prevent those situations.

### Behaviour Science and human decisions

We make hundreds of decisions in our daily life. We can easily remember those which are complicated and life changing: moving to a new city, changing our job, or committing further in a relationship. Those are important decisions and we engage in a slow thinking mode to solve them. However, there are many commonplace decisions that we make almost inadvertently: we choose when to get out of bed, which outfit maximizes fashion codes restricted to forecasted weather conditions...

What kind of tools do we have that are flexible enough to fit such different decisions? How is it that sometimes we enter into a detailed and effortful process, but in other occasions effortless decisions materialize in a matter of seconds regardless of the complexity of the problem? And most importantly, how do we choose when a decision needs one or the other method?

These kinds of questions have been part of a growing body of research known as *Behavioural Sciences*. Its main purpose is to understand how people really make decisions, and by doing that, delivering an articulated alternative to the traditional *homo-economicus*-always-rational model. (DellaVigna, 2009)

### The two-system theory

Students may be able to easily spot that deciding whether they should look for assistance in preparing an exam, or study on their own is an important decision. However, their brains offer them two ways to make up their mind: either a slow effortful decision-process or a fast track. Let's take a look at both of them.

Daniel Kahneman was awarded with the Nobel Prize in Economics in the year 2002, "*for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty*". In the best seller *Thinking, Fast and Slow* (Kahneman, 2011), Kahneman portrayed our decision-making process as a two-actor play. *System 1*, which is intuitive, effortless, and operates without our control, interacts with *System 2*, which is effortful, logical and linked to what we usually know as intelligence. Those two systems interact in any decision we make and may not "agree" on what is the best way to go.

When trying to decide the best way to prepare an exam, a student may engage in a System 2 process, following a slow and detailed analysis of how much he knows about the subject, how far he can go on his own and how much effort he will put in that. Alternatively, he may simply do what his best friend is doing, a typical System 1 shortcut that relates to social norms.

Slow System 2 follows the rules of logic and cognition, and fast System 1 is characterized by non-cognitive processes ruled by *heuristics*. Heuristics are automatic responses that humans have to reduce complex tasks to simple judgment problems enabling us to make quick decisions. In *Judgment under Uncertainty: Heuristics and Biases* (Tversky & Kahneman, 1974), the scholars describe these automatism as "*highly economical and usually effective*". Heuristics do come at a cost, as they may "*lead to systematic and predictable errors*" and in certain conditions, bias our decisions.

In some cases, following the heuristics in our System 1 causes us to act against our well-being; we may end up acting in an "irrational" way by following the choices of those around us who have many similarities to ourselves, such as school peers. It is likely that if there is a way for us to get more information and engage with a System 2 process, we may reach better decisions.

### **Nudges**

Heuristics should not be seen as something bad or good per-se. Problems arise when they are improperly activated by the context. System 1 heuristics may be very useful as it pulls from rules that help us evaluate using stereotypes and infers probabilities even with information of very poor quality. For example, if many spiders are poisonous and I am not able to clearly distinguish what kind of spider I am looking at, a warning alert coming from my System 1 will help me avoid this spider, poisonous or not.

Richard Thaler, winner of the Nobel Prize in economics in the year 2017, together with Cass Sunstein, saw the possibility of improving decisions by designing decision contexts that activate heuristics in a helpful way. They used the term “choice architecture” to refer to this activity. In their book “*Nudge: Improving Decisions about Health, Wealth, and Happiness*” they presented concrete ways in which decisions can be improved using this idea. (Thaler & Sunstein, 2008)

Education can benefit from this active design of context. Many seemingly small interventions targeting behavioural forces have a big impact in improving the academic performance of students. In the rest of this paper some of them will be presented, but first it is important to discuss some specifics of decisions that students make regarding education.

### Decision-making process in education

Many of our most important decisions regarding education are made at early ages and with high interference of adult influencers. Students rely on the advice of parents and professors and are exposed to lots of stimuli pushing them to do things in specific ways. Regardless of these learned behaviours, when left to their own devices adolescents decode context cues in non-standard ways with non-rational outcomes.

### Young adults and adolescents as decision makers

Throughout life, our decision-making skills evolve. Not only are we more capable of understanding complex information, but we can also relate current situations to our past experiences. We develop and learn tools that help us to deal with difficult decisions. This evolution not only refers to the cognitive level (System 2), but also affects our non-cognitive machinery (System 1).

Evolution does not necessarily mean improvement, however. Some heuristics that worsen our decisions seem to be more present in adults than in young people. As adults, we present a regular preference that makes us more risk seeking when we are in the loss region than when we are in gains. This pattern of behaviour makes us value something more just because we have it, pushing us to be irrationally attached to things that we own, even if they can be traded for something that is more valuable or useful for us.

In contrast, pre-schoolers seem to treat gains and losses in the same way, implying that children may be more “rational” than adults. (Reyna & Ellis, 1994) Reasoning in adults seem to be more heavily mediated by memories of qualitative characteristics, suggesting that biases as “loss aversion” may be more prominent as we enter adulthood.

Although adults see many adolescent decisions as mistakes, in many situations adolescent decision-making can be boiled down to different normatives, resulting in different preferences. Some studies suggest that during adolescence we go through some cognitive developments that directly affect our risk preferences in a way that helps us transition from the comfort of our parents’ home to an independent life. (Boyer, 2006) If that is the case, adolescent risk-taking conduct does not correlate with an inability to estimate the probability of negative outcomes. Those flawed decisions that adults see in adolescents may not be caused by less cognitive abilities, or worse information.

### Determinants of academic outcomes

Many different aspects determine the successful acquisition of knowledge by learners. Education achievements can be seen as an outcome of student’s personal story and personality inventory interacting with the constraints and stimuli given by his household and school. In a more formal approach, Roland Fryer proposed that the Education Production Function for an individual  $i$ , can be defined as follows:

$$Y_i = f(E_i, S_i, H_i, M_i, P) \quad (1)$$

Where:  $Y_i$ : academic achievement of individual  $i$ ,  $E_i$ : student  $i$ ’s childhood experience,  $S_i$ : student  $i$ ’s school inputs,  $H_i$ : student  $i$ ’s household inputs,  $M_i$ : student  $i$ ’s “social skills” as grit, resilience and aspects that psychologists refer as “Big 5”,  $P$ : vector of prices (Fryer, 2016). The student’s “social skills” are also referred as “soft skills” or “non-cognitive skills”.

In a 2012 study from the University of Chicago, a detailed analysis of non-cognitive factors was provided (Farrington et al., 2012). They identify five general categories for them:

- academic behaviour: those regularly associated with being a “good student”: going to class, doing homework or studying,
- academic perseverance: a set of psychological concepts that relates to resilience and self-control in order to maintain the focus despite some distractions or obstacles,

- academic mindset: the degree to which a student feels part of the academic community and shares some basic beliefs related to it (*"if I study enough I can succeed in getting knowledge that is valuable for me"*),
- learning strategies: those tactics employed to aid in the cognitive work of thinking (study skills, self-regulating techniques), and social skills: those needed to build constructive bonds with other members of the community.

According to these models, academic performance will emerge from the interaction between external influences and personal models. They explain the decisions and behaviours of students combining psychological and economical insights. Psychology explains them by identifying trait inventory and past experiences. Economics look at them as the result of the expected return of each path.

Focusing on the context surrounding a decision opens a new range of tools for the improvement of student decisions, which will be explored in the next section. Adults can be more helpful to adolescents if they pay more attention to the decision process and its determinants and less to the outcome of the decision.

## Nudges in the classroom

Nudge interventions became popular at the end of the last decade. To help policymakers, and anyone who is willing to find ways to apply behavioural theory insights, in late 2010 a group of five academics from the Institute for Government in UK produced a guide to implementing them. The report was entitled MINDSPACE: Influencing behaviour through public policy. (Dolan, et al, 2010)

The MINDSPACE model offers a useful guide to see the students' decision-making process. It works as a mnemonic guide to remind the elements of the context that condition most of our decisions. The acronym comes from the following concepts explained in the report:

- ✓ **M:** Messenger – Subjects are not neutral towards who gives the prompt
- ✓ **I:** Incentives – Structure of incentives condition highly how we act, although not necessarily in the supposed way
- ✓ **N:** Norms – We are social individuals highly attentive to what norms say (either prescriptive and proscriptive, social or imposed)
- ✓ **D:** Defaults – We tend to follow whatever is presented to us in the form of an option already taken.
- ✓ **S:** Saliency – We are permeable to facts that are salient and new to us, regardless of the real importance they have in our decision.
- ✓ **P:** Priming – Humans tend to be influenced by cues that unconsciously activate positive or negative states of mind, which may not be related to our current decision.
- ✓ **A:** Affect – Our emotions intervene in our decisions.
- ✓ **C:** Commitments – We tend to commit ourselves with plans we make or are made for us, in order to be consistent with our choices.
- ✓ **E:** Ego – We act in ways that make us feel better about ourselves.

### Messenger

#### *Claim*

*Professors can improve the impact of their teaching when they pick the proper messenger.*

When making decisions, we rely heavily on what others say. Students are no exception, in particular regarding their peers and “anti-peers”. Stereotypes are very important during adolescence, and several studies showed how much they can influence their decisions.

#### *Evidence*

In a study done in Madagascar, the effect of alternative ways to deliver information about returns in education was tested. Students' average test scores coming from poor households were more influenced by the information delivered by a more proximate messenger (Nguyen, 2008.) Providing new information was able to change decisions regarding studying, but this effect was heavily mediated by the messenger.

#### *Why it works/How to use*

Proximity and authority are two major drivers to find the proper messenger, but those variables are very sensitive to each group. An “authority” for certain group of teenagers, can be easily seen as a “fool” for others. It is not an easy task to find the proper messenger for students. Adolescents and young adults are strict in picking the correct ones. It may be easier to first identify who would *not* be a good messenger. One, that regardless the quality of the message, could not deliver a positive influence in its targeted audience.

### Incentives

#### *Claim*

*Student performance responds to monetary and non-monetary incentives.*

Much work has been done on incentives for studying. Part of the discussion is focused on the fact that external incentives can undermine “internal motivation”. Evidence is mixed in this field, but in certain contexts with the proper setting, incentives can be crucial elements in habit formation. Lavecchia et al

(2016) offer a review of 28 different interventions that use incentives to help students deal with an excessive focus on the present.

#### *Evidence*

In a large study that involved more than 7.000 schools and high schools in the US, eight key conclusions were given regarding the effect of incentives on student performance: (Levitt, List, Neckermann, & Sadoff, 2012)

1. *Large and immediate monetary incentives lead to improvements in test scores. Small monetary incentives do not.*
2. *Non-financial incentives also impact performance.*
3. *Incentives framed as gains and losses have a similar impact.*
4. *Rewards provided with a delay have no impact on student performance.*
5. *Younger students respond more to incentives, especially non-financial incentives.*
6. *Math scores respond much more strongly than reading scores.*
7. *Boys are more responsive than girls.*
8. *The introduction of rewards does not crowd out future effort.*

#### *Why it works/How to use it*

Incentives owe their power to the effect they have in altering the balance between effort and reward. That is a particularly challenging balance when regarding education decisions. By presenting an immediate gain, students can see the outcome of their effort without waiting. Such cases are evidenced in the fact that rewards have a positive impact, but only if they are immediate.

However, this effect has its limits. Although monetary incentives seem to do the trick, the genre and type of course mediate the effect. But most interestingly, non-financial incentives can have the same impact as money. Behavioural economics literature gathered evidence of this effect in many different contexts. Heyman and Ariely, using a smart experiment design relating to work conditions, proved that while in “money markets” effort is correlated with the size of the reward, in “social markets” they are not. (Heyman & Ariely, 2004)

The potential of “non-monetary” rewards in education is high regardless of its “size”. Even more when presented in company of some “gamification” they can be an unbeatable tool. Collecting fancy stickers for completed interim tasks that can be traded for diplomas may work in some students as an incentive for their academic performance.

#### *Norms*

##### *Claim*

*Students care about what peers are doing and professors can promote academic behaviour by helping them to identify beneficial social norms.*

Social norms have a strong influence in human behaviours. Giving information on the energy consumption of neighbours proved to be a very powerful way to reduce electricity bills. Once you can compare yourself with some peers you are able to change your beliefs and your concrete behaviours.

##### *Evidence*

Interventions trying to expand the set of norms that young people take for granted can be a very effective way to influence behaviours. An interesting example in this field is to stimulate the belief that intelligence is malleable and that students are not “smart” or “dumb” because of their genetics, their family, or their “hood”. Lavecchia et al (2016) present different experiments done in this field that in the end target social norms by questioning them with an alternate set.

##### *Why it works/How to use it*

However, which are the social norms we follow in adolescence? During adolescence, we focus simultaneously in both acquiring and challenging social norms. Questions such as “*what kind of person*

*am I?” or “what are others like me doing?”* churn in adolescent minds, urging for an answer. Moreover, while being young it is particularly hard to picture oneself as the *“kind of person that I will/want to be”*, and to imagine the *“others to whom I will compare myself in the future”*. Helping students to evaluate the conflicts between the norms ruling today and tomorrow can free them from negative herd behaviours. Teaching students the reasons why intelligence is something that can be developed, letting their peers share how they overcame difficulties that can be mistakenly seen as something unavoidable, and implementing techniques that help in contrasting mental construal with alternate paradigms, have proven to be successful.

#### Defaults

##### *Claim*

*Manipulating what happens when students do not choose may help them to follow a beneficial path.* Human beings are lazy, and we tend to like decisions that are taken for us. (Kahneman, 2011) Adolescents and young adults do not escape this rule. We tend to follow pre-set options. Decision paralysis stems from less structured settings that demand from them more active options.

Throughout our life we stick to routines and many good choices heavily rely on them. When routines fail, our good sense fades. Routines help reduce anxiety and free mental resources to put in essential tasks, and students benefit a lot from that. Routines include many tiny default options that heavily impact our decisions and should be carefully watched, and if possible designed, by parents and professors.

##### *Evidence*

Many successful behavioural interventions targeted routines to maintain good academic habits by using text messages, reminders, or apps that help in keeping students attentive. Some very interesting results have also been achieved by adding defaults and changing preferred options. In a 2009 paper, Bettinger and colleagues added tax professional help for families to apply for the Free Application for Federal Student Aid that returns an estimation of their eligibility for government aid. They found that after that intervention, aid application ratios improved, as well as college enrolment the following year and the overall amount of financial aid awarded (Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2009).

##### *Why it works/How to use it*

We misjudge the importance of seemingly small or irrelevant barriers. More simple and structured decision environments can help in improving academic decisions, and a careful study of the “defaults” in the context that students face may remove hidden obstacles.

#### **Saliency**

##### *Claim*

*Professors can increase the impact of their teachings if they emphasize the surprise factor and manipulate attention to things that matter most.*

According to Daniel Kahneman (2011), our attention is directed to one portion of the environment for some seemingly arbitrary motive, and the information contained there is integrated in the decision-making with disproportionate weight. Sometimes we are lucky enough to focus on relevant things, but sometimes not. Our attention has the ability to be captured both by salient events in a stimulus driven way or by our voluntary control. Novel and unanticipated things produce a particular neural reaction that captures our attention.

##### *Evidence*

Techniques of salience manipulation can be extremely effective. In a study on mental contrasting combined with implementation intentions, students exhibited a significant improvement in completion of practice questions. (Duckworth, Grant, Loew, Oettingen, & Gollwitzer, 2011) Mental contrasting, mental elaboration of the desired future in contrast to the present reality, and implementation

intentions describing concrete courses of action to engage when goals are at risk (MCII) are self-regulatory techniques.

Following MCII technique, in the experiment, students were asked to write down two positive outcomes associated with completing practice tests in a workbook, and two obstacles that reality would present to them. Subsequently, they were asked to elaborate on each of the elements (outcomes and obstacles) after imagining them “as vividly as possible”. Then they were asked to complete some if-then plans (“if [obstacle], then [solution]”). The intervention was done during the summer, targeting preparation exercises for SAT exams. It took 30 minutes and caused an improvement of 60% in the workbook completion rate even at a time of the year when students have many other alternatives for their time. Bringing saliency to things already known by students (their goals and possible strategies against obstacles) activated proper behaviours to help them achieve results.

#### *Why it works/How to use*

Adolescent and young adult minds are particularly open to learning and are extremely responsive to novelty. Bringing salience to present benefits, potential obstacles and positive identities can help in the equation.

The essence of this behavioural force relies on how we perceive reality. Manipulation to help students focus in on the relevant things can affect their behaviour if a subsequent plan is made available. Techniques such as MCII that help students in building an implementation plan make it more available at the moment obstacles appear and help to overcome it.

### **Priming**

#### *Claim*

*Students receive multiple stimuli that act in a subconscious level and condition decisions.*

The concept refers to the extent to which perceived physical characteristics of the environment influence our decision making. In *The SALIENT checklist* Dolan and co-authors present an easy to remember acronym for the key elements grouped in this dimension. (Dolan, Foy, & Smith, 2016) The mnemonic *SALIENT* stands for *Sound, Air, Light, Image, Ergonomics, and Tint*.

#### *Evidence*

We cannot avoid listening to things and our attention is directed to them (*Sound*). Temperature and air flow make us behave in particular ways (*Air*). In several studies, evidence pointed to the fact that when eating, if we smell the scent of an all-purpose cleaner we unconsciously clean more frequently our table. The source, brightness and colour of the *Light* make us be more inclined to certain habits; while light has been related to more ethical behaviours (Chiou & Cheng, 2013), darkness seem to incline us to be more creative (Steidle & Werth, 2013). *Imagery* and *ergonomics* are also proven to have an impact on our mood and decision making. Finally, colours can have a powerful priming effect. Although research is not particularly robust in this field, it seems that while red increases performance in detailed-oriented activities, blue has a similar impact but in creative tasks.

#### *Why it works/How to use it*

Through different experiments, a relationship was established between what we perceive through our senses and our states of mind and behaviours. Light and ergonomics can improve the academic environment. Many interventions in priming in education focus on how to nudge students into a proper academic mindset.

Evidence is clear in showing that academic mindset can be influenced by context interventions. (Yeager & Walton, 2011) However, an empirical approach should be used to understand if interventions based on priming have a lasting effect. In some specific situations, educators can influence in positive ways academic performance using these techniques.

### **Affect**

#### *Claim*

*When we are young we frequently experience strong emotional responses to the environment that can contribute in positive ways to education.*

We cannot have thoughts without emotions. They heavily influence our decision-making. In studies related to the *Somatic Marker Hypothesis*, presented by the neurologist Antonio Damasio, evidence points to the fact that emotions are key to rational decision-making. According to his model, during our life we mark situations with positive or negative feelings. When we face a situation that resembles one of our past, our emotions start an incentive or an alarm that triggers our decision. (Bechara & Damasio, 2005)

#### *Evidence*

Stereotype Threat refers to the condition by which members identified with one group that experienced poor performance in a task, relate it with a negative stereotype and tend to follow sub-optimal decisions regarding their personal improvement. A survey in the 2015 World Development Report (World Bank, 2015) presented the results of an interesting study in India where students were asked to solve puzzles. Although puzzle solving skills are not related to the caste belonging, when caste identity was revealed, boys of low-caste performed worse. Making caste salient brought identities that had consequences on performance. Research links this situation to emotional process interfering cognitive processes in particular under Stereotype Threat. (Mangels, Good, Whiteman, Maniscalco, & Dweck, 2012) The authors show that in those cases, negative feedback after failure elicit emotional responses that predicts both disengagement and interference with subsequent learning.

#### *Why it works/How to use it*

Along the decision-making process, we experience plenty of emotions. Sometimes we are able to suppress those we label as “not reasonable”. During adolescence, emotions seem to be highly sensitive to environmental cues and we are less capable of suppressing them. However, there are some developmental benefits that may arise from such a sensitivity to the environment: (a) greater sensitivity to incentives may help young adults to leave the safety of their homes in search for new partners and resources, and (b) greater sensitivity to danger may help them to survive without the vigilant eye of the mother. (Casey, 2015) <sup>1</sup>

Hypersensitivity to environmental cues that trigger potent emotions open an opportunity to educators in designing environments that elicit emotions related to long-term goals, (Farrington et al., 2012) and refrain those emotions that damage education decisions. (Mangels et al., 2012) However, the specifics of such environments are not easily identifiable and require a test, learn and adapt approach. (Haynes & Goldacre, 2012)

### **Commitments**

#### *Claim*

*Students may close the intention-behaviour gap with the proper activation of commitment devices.*

Our brain does not deal well with chaos and luck. We have a compulsion to fit a narrative that sets cause-effect relation to phenomena that surrounds us, in particular relating to our own action. We strive to find the motives behind our acts to the point that we both adjust our behaviour to them, and we model our narratives to contain them. This characteristic ends up chaining our future behaviour to our past intentions or beliefs.

#### *Evidence*

In a study published in 2011, a team of researchers followed a group of students for three years after an intervention targeting transition to college. The experiment was designed to help attributing adversity during the first year to college-adjustment situations instead of fixed characteristics applied to them, or

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<sup>1</sup> Casey (2015) argues that this change in risk preferences and self-control mechanisms, that may not be reasonable under an adult normative, is important in evolutionary terms in the transition from individuals from child to adulthood translating into new and expanding possibilities.

their ethnic groups. To do so they used the “saying-is-believing effect”: people tend to endorse messages they deliver. Students were asked to write an essay and deliver a video message to future generations arguing that hard times as freshmen were temporary and they can be overcome. (Walton & Cohen, 2011) The essay and the message elicited commitment feelings in students who presented them, an increased sense of belonging and general well-being and improved academic performance in the following years. These effects were more intense in African-American students. The authors concluded that subjective construal is malleable as many events are ambiguous and fit alternative interpretations, thus opening a field for these type of interventions as ways to improve student well-being and academic performance.

*Why it works/How to use it*

Professors can help their students by eliciting commitment feelings either in relation to concrete tasks or to positive states of mind. As noted, if students are asked to set a plan to overcome a potential future obstacle, the probability of success increases, (Duckworth et al., 2011) and if they deliver a positive message, a feeling of commitment will move them to act in accordance to it. On the other hand, if our memories of past attitudes are more salient, it will be harder for us to change them.

**Ego**

*Claim*

*In their quest for their identity, students make decisions that build specific images of them. That is an effortful activity that depletes their will-power.*

We build a positive image of ourselves and subsequently we act in ways that we think we can maintain. We do things to see ourselves as more similar to those we like, and we are ambiguously averse so we tend to like consistency in people.

Maintaining our image requires a high dose of control. However, that control is expensive in terms of cognitive resources and our will-power fades when we are tired.

*Evidence*

We face problems of self-control when facing a table with healthy and tasty food if we previously engaged in a depleting task that demanded self-control (i.e. memorizing 7 numbers). In a study focusing on behavioural spill-overs, such dynamics were identified. The cost of maintaining a desired attitude can be so high that ignites other undesired behaviours generating a negative overall effect. (Dolan & Galizzi, 2015)

*Why it works/How to use it*

This is a powerful force that shapes our behaviour. Making students say publicly what they plan to do, or reminding them about commitments they have done can be a useful tool to help them stick to their plan. However, the effortful task of building a specific personal image is tiresome and may backfire.

Exercising the control to be the desired person may be as expensive in that students may feel they can “indulge” themselves in other aspects. The size and nature of those gratifications can derail the project of becoming a better student.

Behavioural sciences bring new tools to help improving academic performance of adolescents and young adults. The MINDSPACE framework helps in providing a route to deploy a comprehensive plan for them.

### Concluding remarks and further reading

This paper reviewed the decision-making of adolescents and young adults in relation to their studies. The human decision-making process is much more complex than what rationality would predict and we usually end up doing things that are not in our best interest.

Using the Behavioural Science toolset to target those decision errors, professors can become choice architects of students' decisions, helping them to achieve their academic goals. The MINDSPACE guide offers a systematic revision of the many "non-cognitive" forces that influence the decision-making process. Concrete application of examples provided in this paper could benefit a wide range of education sectors.

The relevance of the field attracted the attention of a wide group of researchers that are bringing sound theoretical background and effective tools to complement the traditional mechanisms. Three documents are recommended to gain a wider view on the field:

- *"Teaching adolescents to become learners: The role of non-cognitive factors in shaping school performance"* provides a very useful model capturing the main non-cognitive factors influencing student performance and describe their interaction. (Farrington et al., 2012)
- *"Behavioral Economics of Education: Progress and Possibilities"* makes a comprehensive revision of interventions in widely different contexts with various methodologies. (Lavecchia et al., 2016)
- *"The Behavioralist Goes to School : Leveraging Behavioral Economics to Improve Educational Performance The Behavioralist Goes to School : Leveraging Behavioral Economics to Improve Educational Performance."* presents a wide study involving more than 7,000 US schools about incentives in education. (Levitt et al., 2012)

By actively designing proper contexts, educators can target the useful automatisms and stop the damaging ones, promoting positive behaviours.

Professors can leverage the efforts they put into developing talent and widening cognitive abilities of students using behavioural tools.

### About Gabriel Inchausti, the author

Gabriel Inchausti graduated in Economics from the University of the Republic (Uruguay), has professional specialization in corporate finance and strategy, and is currently pursuing a Master's Degree in Behavioural Sciences at the LSE. He is a professor and lecturer in topics related to Behavioural Economics in Uruguay and Brazil, and is an active researcher in the field. His research focus is in the area of Education and time preferences. On the professional side, he was Executive Officer for a major South American beef group and General Manager in an important media group in Uruguay. Currently he is chairman of the board in a South American software company.

My approach to the behavioural science of education blends my experience as a corporate manager and my academic background in social sciences. As any decision maker, students and educators sometimes make mistakes and many times we see them related to lack of information or a poor rationale. However, research shows that some of those errors are situational responses to signals embedded in the context. By decoding the relationship between those signals and the behaviours they elicit, we acknowledge our role as architects of helpful contexts.

Behavioural science approach provides professors and principals with tools and ideas that let them shape student's context of decisions. Using the extensive literature available and promoting a strict evidence based decision making process, is possible to inform better tailored local policies.

**The purpose of my paper is to present these ideas in a practical way to those that assume the generational mandate of passing our knowledge to the next.**

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