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Strategizing with Biases:

Engineering Choice Contexts for Better Decisions using the Mindspace Approach

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Abstract

We introduce strategists to the Mindspace framework and explore its applications in strategic contexts. This framework consists of nine effective behavioral interventions which are grounded in the public policy applications, and focuses on how changing the context can be more effective than attempts to de-bias decision-makers. Behavioral changes are likely when we follow rather than fight human nature. Better decisions can be achieved by engineering choice contexts to "engage a bias" to overcome a more damaging bias. We illustrate how to engineer strategic contexts through two case studies and outline directions and challenges when applying Mindspace to strategic decisions.

Keywords: decision biases, Mindspace, choice architecture, strategy

Introduction

Good decisions are central to effective strategizing. Yet decades of research show that managers are subject to systematic biases that can lead to costly errors.[1,2] The question is: are these biases fixable?

Conventional approaches to eliminating biases focus on *changing the mind* of the decision-maker. If people can be trained to recognize their biases, thereby gaining the ability to think more logically, carefully and to more closely approximate the fabled rational decision-maker, better outcomes are more likely.[3,4] This implies that good decisions require managers to be "de-biased", possibly through education or training.

We introduce strategists to an alternative framework for managing decision biases by *changing the contexts* – the "Mindspace" framework.[5,6] Mindspace is the mnemonic of nine contextual forces that can significantly shape our behaviors: Messengers, Incentives, Norms, Defaults, Salience, Prime, Affect, Commitment and Ego. Conventional de-biasing aims to make existing decision making strategies more accurate, whereas Mindspace helps reframe the decision so that different contextual forces can be employed to induce behavioral changes. In a nutshell, to combat a known bias, the Mindspace approach engages System 1 thinking processes while the de-biasing approach engages System 2 processes. The implication is that better decisions can be achieved by engineering choice contexts: engaging a bias in order to overcome a more damaging bias.

This new way of thinking has its roots in the seminal book "Nudge"[7] and is based on the premise that decisions are often easier to change when we "go with the grain" of human nature.[8] The same errors that cause us to stumble can also be used to help us make better choices. Grounded in the latest findings in the behavioral sciences,[1,7-10] the Mindspace framework has demonstrated its effectiveness in public policy contexts across numerous domains, including health, finance, and climate change.

In this paper, we argue that the Mindspace framework can also be fruitfully introduced and extended to strategy, because some of the most important challenges in competing, organizing, and collaborating effectively are behavioral.[11] After a brief introduction of the nine contextual forces that form the cornerstones of the framework, we introduce two real life cases to illustrate how Mindspace has been applied in strategic settings: in the first case Mindspace was used to improve implementation of a formulated strategy, while in the second case it was used to improve strategy formulation. Next, we outline some tentative applications of the Mindspace framework to a wide spectrum of strategic activities, including M&A, hiring decisions and organizational design. We hope that our paper will serve as a stepping stone and inspire Strategy researchers and practitioners to provide more theoretical as well as empirical support for the idea that strategists can improve decisions by working with, rather than against, managers' intuition.

Mindspace: Using One "Bias" to Overcome Another "Bias"

Changing the Mind versus Changing the Context

Changing the mind of the decision maker, or de-biasing, has been the primary approach to improving decisions for decades. Recent research suggests, though, that de-biasing is insufficient because it only deals with our slow, deliberate, conscious thought-processes – our System 2 thinking. Yet our fast, automatic, unconscious decision making system – System 1 thinking – is often as crucial.[12] Rapid System 1 processes provide the lens through which we understand the strategic problem (e.g., cooperating with a friend, responding to the threats of a potential enemy); focus our attention (e.g., which risks, which opportunities?) and generate the "gut intuitions" that rule out some options and push others to the top of the queue. Fast System 1 processing lays the groundwork on which slow, conscious

System 2 analysis can take place. If System 1 processing misleads us, we are more likely to make a flawed strategic choice, even before conscious deliberation begins.

Importantly, System 2 thinking often fails to correct for the problems that result from System 1 thinking because decision-makers are unaware of how System 1 influences their decisions and actions. For example, studies have found that factors that should be irrelevant from a rational perspective (such as the weather being sunny or cloudy) can significantly influence the decisions made (such as which applicants receive job offers).[13,14] Similarly, in a legal context, the time of day (and hence whether judges are hungry or tired) can dramatically affect the probability of conviction or acquittal.[15] Managers facing critical strategic decisions are likely to be similarly influenced by factors outside of their awareness. The unconscious nature of these influences makes them harder to combat.

Even when the decision-makers do recognize these processes, they do not sufficiently adjust their System 2 processing.[1] For example, consider how optimism can bias our tendency to believe that projects, whether in daily life, business or government, will be completed more quickly and cheaply than turns out to be the case.[16] One prominent de-biasing approach in forecasting is to encourage people to take an "outside view" – putting more weight on the statistics of a suitable reference class than on their own estimate of the specific case to be evaluated.[17] For example, when judging the likely success of a product launch, outsourcing deal or merger, we should ask: "how often do new products in this sector usually succeed?", "what is the typical fate of mergers?," or "how frequently do outsourcing deals of this specific type turn out to be profitable?". Yet research on optimism bias shows that even when informed of relevant and reliable statistics, people still do not fully correct their tendency to overestimate desirable outcomes (and their tendency to underestimate the undesirable ones).[18] Thus, strategies can be suboptimal even after steps are taken to de-bias managers' decisions.

Note that we are not arguing that all System 1 thinking leads to biases and inaccuracies. Some cognitive shortcuts do not sacrifice accuracy for speed because they exploit environmental regularities.[19,20] Some System 1 thinking processes are fast and frugal heuristics that have even been argued to be "better than rational"[21] in particular contexts, thus exemplifying "ecological rationality".[19] In general, we can trust our System 1 intuitions when they have developed in a stable environment with reliable feedback.[1,22] In contrast, our intuitions are likely to lead us astray in many strategic contexts that are unpredictable, noisy and are influenced by many interacting factors. In such settings, feedback is unreliable and experience can be misleading.[23] Our focus is on the challenge of improving strategic decisions when System 1 thinking is predictably flawed.[9]

For all of the reasons above, de-biasing techniques by changing minds do not necessarily work. This paper introduces strategists to an alternative framework for managing the System 1 biases by *changing the contexts* – the "Mindspace' framework. This framework was first introduced by Dolan et al., (2012)[5] to help policy makers address policy challenges across many domains, including health, finance, and climate change. This framework has attracted substantial attention, particularly after both the UK and US governments adopted Mindspace and other closely related approaches (such as nudges).[24] Many have argued that the adoption of such approaches has saved millions of dollars, thousands of lives, and has effectively addressed sustainability issues such as energy savings.[1,7,8]

The Mindspace framework is a list of nine important influences on System 1, which arise from closely related brain and psychological processes (for a description of brain structures and review of the evidence, see Vlaev and Dolan 2015; Vlaev et al., 2016).[6,25] In particular, the nine Mindspace components can be distinguished by two separate mechanisms for automatic behavioral control: the impulsive mechanism and the habit mechanism. The impulsive mechanism connects specific stimuli (e.g., food, money, social ties) to

evolutionarily acquired psychological processes (e.g., belonging, attraction, comfort, disgust, fear, nurture, status, self-worth, trusting) and trigger innate automatic behaviors broadly described as "approach" and "avoidance." On the other hand, the habit mechanism is developed through processes of reinforcement learning (i.e., actions that are associated with rewards are repeated whereas those associated with punishments are avoided), depending on the specific environment an actor is in. The literature supports the assumption that the habit mechanism generates *motor habits* - motor programs or behavioral schemata that have been frequently executed in connection with contextual cues as well as *mental habits* such as heuristics (see this endnote[26] for more details). Table 1 provides a summary of the Mindspace framework and the specific psychological processes that generate each of the nine Mindspace components. The Mindspace components, by themselves, are neutral and do not necessarily lead to biases or problems. In fact, many of them are hardwired into our cognition because they are likely to be good strategies that exploit the recurrent evolutionary challenges our ancestors faced.[19] Mindspace recognizes the importance of these drivers of behavior and makes use of them to influence behavior.

[insert Table 1 about here]

For example, our craving for fat and sugar makes evolutionary sense in an environment where food is often scarce, but contributes to obesity today in societies where food is plentiful. The traditional solution to the public health problem caused by obesity is to resort to our System 2 thinking – through health education or improved nutrition labeling. Such techniques may change attitudes and knowledge, but research has shown that they do not have lasting effects on what people's eating behavior.[7] As documented in "Nudge",[7] resorting to System 1 thinking to change the context has been shown to be a more effective way of inducing behavioral changes. In one experiment, a school cafeteria was able to increase students' milk consumption, while decreasing the fat and sugar consumption, simply

by making low fat milk more *Salient*, i.e., putting milk on the front shelf while leaving the sugary drinks on the higher shelves or at the back. This example illustrates how one "good" System 1 process is engaged to combat another "bad" System 1 process (of course, "good" and "bad" here are defined purely in the specific context, here of reducing obesity).

We believe that the Mindspace framework has important implications for strategists because some of the most important challenges in competing, organizing, and collaborating effectively are behavioral.[11] Mindspace offers a novel, evidence-based tool for addressing these challenges. Below we first offer an overview of the nine interventions in Mindspace, before discussing the application of Mindspace in strategic contexts.

Messengers

A well-known behavioral tendency is the influence of those who communicate a message: the same message can be interpreted differently depending on who sends it. We give more weight to information that is communicated by credible people: those who are perceived to have greater authority, expertise, to be more prestigious or have higher status, or those who seem to be similar or somehow connected to us. Once a messenger's credibility is confirmed, we often comply with whatever they communicate unthinkingly, even when the messages sent are mistaken, foolish or immoral.[27,28]

Messengers who are perceived to be credible may indeed have better insight or access to useful information and paying attention to them is often entirely appropriate. Problems arise when the credibility of the messenger is misplaced. For example, people usually rely on experts' predictions, yet these experts often predict quite poorly in several important areas, such as election results;[29] future stock prices;[30] or whether a technology will become the next "big thing".[31] The messenger effect is maladaptive when the accuracy of experts' messages is decoupled from the apparent credibility of their messenger status.

Managers can rely on this Messenger effect to induce behavioral change. People may be skeptical of an alternative because they do not trust the people promoting it, for example, farmers in developing countries can be concerned that micro-financing schemes seem "too good to be true," suspecting that their promoters have a hidden agenda.[32] To encourage adoption, the promoters ask early adopters to help convince other farmers who are more like them, rather than targeting farmers who need financing the most. Adoption increases as a result because people are more likely to trust people who are similar to them.[32]

Incentives

Our responses to incentives are characterized by predictable mental shortcuts. For example, we often evaluate alternatives on how their outcomes compare to certain reference points (which might be the status quo or, alternatively, what we expected to happen), rather than absolute terms. In addition, losses (outcomes which are below reference points) loom larger than gains (outcomes above reference points). The resulting loss aversion (and also risk aversion) can explain many behaviors that deviate from the principles of rationality.[33] Furthermore, people's interpretation of incentives is also sensitive to contextual factors. For example, if a scenario of potential loss is more accessible in memory,[34] or if this scenario is described in a more detailed fashion,[35] loss is considered to be more probable and loss aversion is increased.

Managers can use such behavioral reactions to incentives as a more effective means of steering behavior. Consider the challenge of generating truly new ideas in organizations. Most new ideas will cause disruption, as well as having benefits: and such disruptions are coded as losses when compared with the status quo. Thus, a new idea may be undervalued and avoided even when it is advantageous in the long run.[36] Behavioral research suggests two ways in which strategists can engineer the context of decisions to reduce risk and novelty aversion: (a) reduce the frequency of evaluating the outcomes of new ideas; and (b) set the

rewards associated with gains to be at least twice as much as the penalty associated with losses.[37] Both have been demonstrated to help evaluators to combat loss aversion.[5]

Norms

We are strongly influenced by what others do, for instance, in our cultural preferences and in our technology adoption choices. Such social influences may result from informational conformity – following others' behavior may be useful and less costly than our own trial and error learning in cases where we believe others have more experience and know better than we do.[38] For example, we are more likely to try a new technology if many close friends have adopted it. In addition, there are powerful social forces which encourage us to conform: we do not want to be considered different or be singled out.[28] For example, the classic Asch conformity experiment shows that people often conform to the majority opinion even when they know it's wrong.[28] Managers can induce positive behavioral changes by exploiting this tendency to conform. For example, hotel guests are more likely to reuse their towels when given the message "75 percent of the guests who stayed in this room had reused their towels" than when given the message "help save the environment".[39] Many people who want to "save the environment" do not reuse their towels because they can be either lazy or paying little attention. The application of *Norm* here effectively induces a change that is good for both the individual and the society.

Defaults

We often "go with the flow" by defaulting to pre-set options and these *Defaults* can have a powerful impact on behavior even without necessarily restricting choice. For example, when the default is to automatically enroll employees in their pension plan, about three-quarters tend to retain both the default contribution rate and the default asset allocation. Also, introducing a participation default can increase participation rates among new employees by more than 50%.[40] Such powerful effects of defaults on behavior have been observed in a

wide range of settings including organ donation decisions, choice of car insurance plan, car option purchases, consent to receive e-mail marketing, employees' contributions to health care flexible-spending accounts, and vaccination and HIV testing for patients and healthcare workers.[41,42]

Defaults are particularly important for inducing behavioral changes because people often default to no choice at all for some important decisions, such as enrollment in retirement and health care plans or organ donation. While an optimal option may be difficult to judge, the worst option may sometimes be no choice at all. Replacing the "no choice" default with an advantageous default option can improve the welfare of the decision-makers and society.[41,42] The next section provides an introduction of how engineering defaults can help to improve strategy implementation.

Salience

Our attention is drawn to what is novel and seems relevant to us, yet Salience does not always signal importance. For example, people were asked to estimate the year that the Taj Mahal was built after writing down the last three digits of their phone number, adding a preceding "1" to their 3 digits, and indicating if the resulting four-digit number was smaller or greater than their estimate of the year for the Taj Mahal's construction. The results showed that the estimated years for the construction of the Taj Mahal were significantly higher if participants happened to have a higher four-digit number provided by their phone number plus the preceding "1". A piece of information (in this case three digits from a phone number) without any logical connection to the estimation task nevertheless can work as an effective anchor when people have little knowledge about the task.[3] Furthermore, despite clear experimental evidence to the contrary, people typically deny the influence of these salient, contextual factors in their decisions.[14] For this reason, they cannot correct for the salient information because System 2 is not aware of how System 1 works.

Managers can also exploit *Salience* to manage the attention of others. In the school cafeteria example we mentioned before, healthy drinks are chosen more (desired outcomes) when they are placed in the front shelves (i.e., made more *Salient* to the kids).

Prime

We are influenced by thousands of sub-conscious cues each day. These *Primes* can be words (e.g., one feels more powerful and confident if being asked to describe an experience in which s/he has power over others); sights (e.g., larger food containers lead people to eat more); smells (e.g., the scent of an all-purpose cleaner makes people more likely to keep their table clean); or even weather (e.g., cloudy weather makes evaluators focus more on the hard evidence, such as candidates' track records, than on soft evidence such as interviews). But we are not aware of how our preferences and decisions are shaped by these *Primes*. This suggests that many plans may not be implemented successfully because those who are implementing it can deviate from the plan due to irrelevant, unpredictable contextual stimuli. Our actions may seem unpredictable, and often non-rational, given that many everyday stimuli are random and unrelated to the decision at hand.

Knowledge about priming can help strategists influence others, or at least avoid being taken advantage of by others. For example, research shows that the color of the cover of business proposals can significantly and systematically influence evaluation outcomes,[43] with blue enhancing acceptance rates while red reducing it. If you want others to think about something more analytically, it may help to present the question in more blurred or less easy-to-read fonts because reduced reading fluency is associated with increased attention.[44]

Affect

Our emotional associations can powerfully shape our decisions and actions. Emotion-based decisions are not necessarily maladaptive. Many important tasks do not have attainable optimal solutions, and often a key question is when to stop searching for better solutions and

settle for a solution that is "good enough".[45] Emotions can work as a stopping rule for searching. For example, falling in love can be an effective stopping rule for searching for a soul mate – once a "good enough" partner appears, the emotions related to love kick in, thereby ending the search and strengthening commitment to the loved one. Note that purely cognitive stopping rules such as satisficing do not necessarily predict commitment. There is the danger that a "satisficer" will attempt to change partner as soon as a slightly more attractive one appears.

Emotions can also lead to problems arising from overreactions that can go on to affect others. For example, business cycles can occur, even without any significant changes in the economic fundamentals. Instead, the business cycles may be (over-)reactions triggered by the cascades of optimism (leading to the booms of the market) and fear (leading to the busts), and these emotions are further channeled by networks and reinforced by social influences.[46] Understanding and exploiting *Emotion* can help to combat other more damaging biases. For example, the practice of washing hands with soap after using toilets (or before eating) did not become popular in Ghana until a TV advertisement (based on a series of field experiments by behavioral scientists) provoked the emotion of disgust linked to not washing hands. Resorting to System 2 thinking, i.e., elaborating the benefit of using soap, was not useful in promoting this health behavior, but System 1 thinking, i.e., *Affect*, increased the use of soap by 41% through the motivation of avoiding the (negative) emotion of disgust.[47]

Commitment

We seek to be consistent with our public promises, and we reciprocate beneficial acts by others. The *Commitment* effect is another lever with which to design the context of decisions for favorable outcomes. For instance, public commitment reduces procrastination by increasing the cost of failure (e.g., through reputational damage). Smokers who are publicly committed to quitting are more likely to succeed than those who commit privately.[48]

Importantly, a desirable behavior can persist long after the commitment-violation cost is gone, suggesting that public promises can be an effective short-term way to induce long-term behavioral changes.

The commitment effect has important implications for combating the problem of cooperation in contexts where each individual may benefit from acting selfishly (e.g., the prisoner's dilemma, the tragedy of the commons), because we are hard-wired with a desire for fairness and reciprocity. Moreover, we are willing to punish unfair behaviors even when it is costly to do so and we feel compelled to reciprocate a good turn. This implies that publicly declaring goodwill to counterparty at the start of collaboration is likely to enhance the relationship. We will discuss in the next section how one can engineer with *Commitment* to attain other desired outcomes such as obtaining innovative ideas.

Ego

We act in ways that make us feel better about ourselves. For example, we make self-serving attributions in order to maintain a positive self-image, attributing our successes to our own ability and effort, but ascribing our failures to unforeseen circumstances, other people, and plain bad luck. This is particularly problematic when evaluating exceptional performances as exceptional successes tend to happen in exceptional circumstances. These outliers owe more to the situation and less to the people who happen to be in the right place and at the right time.[49,50] People tend to attribute otherwise and those lucky executives with boosted egos can lead organizations astray, e.g., by being overconfident or taking excessive risk in subsequent decisions such as mergers and acquisitions.[51]

One approach to combat *Ego* is to engage in counterfactual thinking. Ask yourself: how likely is it that the success will happen even without your contribution? The answer is less important than asking the question itself. By considering how things could have happened differently, or could have happened without you, it is likely to attenuate the self-

serving attribution biases. An example in practice is organizations engineering the context by including counterfactual questions in performance reviews.

Changing the Mind or Changing the Context?

Mindspace, with its nine tools to induce behavioral changes by resorting to our System 1 thinking, offers a toolbox that is complementary to conventional approaches. While many examples we have discussed suggest that changing the context is more effective than changing the mind, we argue that the use of Mindspace framework does not preclude the use of other solutions. Effective "choice architects" do not, and should not, limit their behavioral intervention tools to Mindspace or nudges. In combating obesity, policy-makers have also incentivized the producers and distributors through subsidies and pro-rating taxes, which are conventional solutions aimed at changing minds. These measures indirectly "nudge" consumers because the healthy options are now cheaper and easier to obtain than unhealthy ones. As one of our co-authors testifies (who has acted as an advisor to the UK Behavioural Insights Team, popularly known as the "Nudge Unit"), actual policies are often a mix of influencing both System 1 and System 2 thinking, depending on the context and the field experimental results. Next, we introduce two real life cases to illustrate how Mindscape could work beyond public policy contexts.

Case Illustrations

To what extent can Mindspace be extended to strategic contexts? The way Mindspace is used in the public sector suggests that it may be particularly useful for ensuring swift and effective implementation when desirable objectives and strategies are known. The challenge is to make changes happen. Below we first introduce a case of how an application of Mindspace, i.e., changing defaults, can improve the implementation of a formulated strategy and discuss implications for strategists. Next, we illustrate how Mindspace may be useful in

strategy formulation. We have highlighted the relevant and corresponding interventions in Mindspace in capitalized italics.

Choose Less to Save More in Healthcare Organizations

Strategists and top executives in the field of Healthcare face a challenge: the trajectory of healthcare spending in many advanced economies may be unsustainable.[52] Healthcare expenditure is predicted to reach levels that will threaten the future financial sustainability of organizations and countries alike and will require trade-offs with other areas of public expenditure.[53] In the US, recent estimates reveal that around one third of health care spending is due to unnecessary waste.[54] Given these findings, a clear strategic goal for health care organizations is how to control total health care costs while improving, or at least maintaining, the quality of care.

Managers in health care organizations are aware of the scale of the challenge, but many of them still rely on traditional reforms which control either the demand side (e.g., introducing more paper work when receiving patients) or the supply side (e.g., cutting staff hours). These conventional approaches do not seem to be effective for achieving the strategic goal – their effects either do not last or are damaging to staff morale.[55]

One recent investigation suggests that a promising alternative is to reform an overlooked supply side process in healthcare organizations.[55] While existing approaches to organizational reform assume that actors in healthcare systems will always behave rationally,[56] new behavioral methods such as Mindspace pay closer attention to how people actually behave and the results suggest that health care staff, including doctors, do not always behave in a way consistent with the strategic goal of reducing resource waste.[55] Below we introduce two examples of how using *Defaults* from the Mindspace framework, helps to effectively address this challenge.

One clinical practice known to impact negatively on the sustainability of health services is doctors' unwillingness to prescribe generic drugs, despite their cost-effectiveness. Most healthcare options have some kind of default, whether intended or not, and the choice of default will have a powerful effect on healthcare quality and outcomes. Default settings are often chosen on the basis of natural or historical order or convenience, rather than to increase the likelihood of beneficial strategic outcomes. Furthermore, changing defaults is often free or costs little. A recent field experiment reveals that changing defaults can induce changes in doctors' behaviors and contribute to health care systems' strategic goals.[42] In this study, the default for two general internal medicine clinics based at the University of Pennsylvania were changed from the status quo (i.e., displaying both brand and generic medications) to a new system in which only generics are displayed with an option to opt out. Rather than issuing guidelines that could easily be ignored, the electronic prescribing systems were redesigned to ensure that generics are the default choice.[57] At the same time, two family clinics operating within the same area continued to use the status quo prescription setting. This field experiment covered three medications: β-blockers, statins, and proton-pump inhibitors. The internal medicine providers significantly increased generic drug prescribing compared with the family medicine providers for all three medications combined and this case demonstrates how the use of default options can reduce waste and improve the value of patient care.

Another study conducted in Chicago reported dramatic improvements in an intensive care setting when a default was set to make daily breaks in sedation (interruption of sedative-drug infusions) automatic for patients receiving mechanical ventilation, unless otherwise indicated by a physician.[58] Such breaks allow neurological examinations and tests to assess alterations in mental status, which, if performed regularly, may accelerate recovery, while continuous infusions of sedative drugs is likely to impede efforts to perform such examinations. As a result of this new default setting, the median duration of mechanical

ventilation was 4.9 days in the intervention group, as compared with 7.3 days in the control group, and the median length of stay in the intensive care unit was 6.4 days as compared with 9.9 days, respectively. Given the high costs of caring for critically ill patients, it is immediately apparent how this low cost intervention has significantly reduced the cost of care, both directly (including costs of hospital stay and sedative drugs) and indirectly, through costs related to complications of mechanical ventilation (such as ventilator-associated pneumonia and barotrauma). This case shows how changing defaults can not only save lives, but can also make healthcare more economically sustainable.

Discussion. The two healthcare cases discussed above illustrate how changing defaults motivates people to behave in a way consistent with the strategic goal of reducing resource waste. These examples also highlight how Mindspace can improve strategy implementation given a formulated strategic goal. A problem was diagnosed in the health care context: too much waste that damaged the sustainability of the system. A strategic goal was formulated to reduce cost while maintaining at least the same level of quality, but the question remained as to how to best execute this strategic goal and induce behavioral change. After running several sets of field experiments, managers applied changing the *Defaults* from the Mindspace framework to reflect best practice.

Note that even in this case where the right decision seems to be uncontroversial, it is difficult to induce behavioral changes before Mindspace is utilized. The "default" way to execute the strategic goal was not applying Mindspace, but traditional approaches such as cutting staff hours. Field experiments were conducted and demonstrated the effectiveness of the unconventional approach, i.e., by changing the context. The experimental evidence then helped to overcome the old "default" of applying traditional approaches.

This case also illustrates how a technology (i.e., electronic prescribing systems) can help implement Mindspace, and to "nudge" doctors successfully. A related example is

"Captology", a platform developed by Stanford Persuasive Technology Lab, to motivate, enable and trigger people to do things differently. The application of Captology is consistent with Mindspace - a choice architect needs to understand the context, including actors' motivation, ability and behavioural triggers, to maximize the changes in behaviours. Integrating technology to facilitate the changes is a promising route for strategists to consider, as our case illustrates.

How could changing defaults help strategists in non-healthcare related industries? One important challenge in organizations is resource allocation to ensure sufficient exploration of novel alternatives. Firms are likely to underinvest for the future if they default to directing resources towards existing activities and away from exploring new and potentially more profitable activities: in short, the default is to continue to exploit, even when it would be better to explore instead.[59] The question is: how to induce behavioral changes to ensure a healthy level of explorations?

A successful policy nudge scheme, Save More Tomorrow,[60] may provide inspiration for strategists in addressing the challenge of balancing exploration and exploitation. The scheme designs a default in which employees pre-commit to higher future contributions after receiving a pay rise and this default option will remain in place unless the employees opt out. This is an effective nudge, indeed one of the most successful policy nudges,[7] because a common default is not to change the saving level, which will likely lead to under-saving for retirement. In addition, the scheme sets the growth of the contribution after pay rise to be smaller than the growth of the income and the change is likely unnoticed because the employees' take-home income is not reduced (which combats loss aversion).

In a similar vein, firms can implement an Invest More Tomorrow scheme that sets a default of reinvesting a pre-set percentage of the profit generated from the existing options in novel alternatives. Take for example 3M's "15% time," a program that allows employees to

use a portion of their paid time to pursue their own projects. Successful implementation of such schemes requires that the purpose of these defaults be well communicated — and the scheme may be more readily accepted if the rate of investment ramps up slowly over time. If the reinvestment is not paced in this way, people can challenge the motives of setting these defaults because their losses may be immediate (e.g., managers in charge of existing projects have less resources to reinvest), while their benefits are ambiguous and in the future (e.g., there is no guaranteed gains for the investment for novel projects).

In sum, these cases of changing defaults illustrate how Mindspace can be useful for the implementation of a clearly formulated strategy (e.g., to reduce waste). In practice, it can be difficult to distinguish between strategy implementation and formulation, with both being necessary parts of an iterative learning process in which feedback from testing and trial implementation is used to inform and update the formulated strategies. Strategists need to implement a formulated strategy to learn how effective a new option is in particular contexts. Furthermore, if the implementation is effective, it is relatively straightforward to attribute the outcome to the formulated strategy. In contrast, if the implementation is flawed and results in failure, it is not immediately clear whether the outcome is attributable to the formulated strategy or its flawed implementation. In this sense, improved implementation made possible by Mindspace can enhance learning.[61] As the examples illustrate, the effectiveness of the Mindspace application was not obvious from the outset and it was only when early results demonstrated that Mindspace was superior to the status quo did strategists adopt the Mindspace approach.

Innovate More by Searching Less in Venture Capital

A common challenge to strategists in venture capital is to identify the next big thing: which product is going to be the most popular; which technology is going to dominate; which start-up is going to have the first breakthrough. How to make smart bets on these high-risk,

high-return alternatives is crucially important yet is fraught with the potential for suboptimal bets. For example, we prefer to interact with people that are similar to us. We understand them better, interact with them more frequently, and like them better. This natural tendency is sometimes called homophily – birds of a feature flock together.[62] People outside of one's cliques are likely to be dissimilar to us and are thus more likely to be misunderstood and/or disliked. Homophily bias implies that some technologies or firms can be overvalued/ undervalued if they are/are not within the evaluator's clique.

Overcoming the homophily bias is therefore a crucial challenge for venture capitalists whose job is to identify big hits, or disruptive innovations. These ideas are likely to come from people who are more peripheral in the network,[63] and be ignored by incumbents or those central in the network biased by homophily. Identifying these peripheral players with truly undervalued ideas can promise huge returns for those who can effectively strategize and overcome the homophily bias.

These successful venture capitalists are the "brokers" in social networks.[64] They channel and recombine the information from multiple cliques that otherwise would not have been in contact and play a crucial role in realizing the potential of these opportunities. The question is whether and how their valuable social network positions can successfully be sought ex ante. After all, many of these brokers are graduates of elite schools like Stanford and have superior connections due to their family background. The "broker positions" that enable them to overcome the homophily bias cannot be easily replicated. How can one overcome the homophily bias without simply happening to be in the right place at the right time?

Draper Fisher Jurvetson (DFJ), a US venture capital firm, offers an example of how to engineer the context to attenuate the homophily bias and thereby increase the likelihood of

identifying the next big thing.[65] Their strategy, which has led to high-profile successes such as Hotmail, Baidu, Skype and Twitter, has two unconventional features.

First, instead of "searching for a needle in a hay stack", DFJ engineers the context in order to attract ideas. To overcome homophily they aim to maximize their exposure to different ideas and people. Here is what DFJ did: once a promising field emerges (such as nanotechnology in early 2000), DFJ publicizes themselves as a leading investor in this field through high-profile activities such as extensive blogging, media appearances and speaker engagements. That is, instead of de-biasing its partners from homophily (i.e., seeking deals from similar others), DFJ goes with the grain of System 1 thinking by making itself a *Salient* and *Committed* investor in this emerging field with high uncertainty to attract attention. Note that this approach is the opposite to the conventional, secretive approach of most other venture capitalists. DFJ overcomes the homophily bias by opening up, exposing themselves to a large volume of business proposals from the widest possible range of sources, including those out of reach of even the most connected network brokers. As DFJ partner Steve Jurvetson put it: "We want to become a powerful magnet so the needles find us".

Second, attracting a large volume of ideas poses challenges for evaluating them. The large volume of proposals firstly implies that the variance among them is likely to be high, which is actually good for DFJ because the goal is to get a few upside "home-runs" and exposing the firm to maximum variance is consistent with this goal. Note that this approach runs counter to our natural tendency to avoid not only losses but also uncertainty (*Incentive*). With a clearly defined and well-communicated goal, DFJ overcomes uncertainty aversion and embraces variance. The second implication of a large volume of proposals is that the average quality of the proposal is likely to be lower than that selected by the conventional, more focused approach. This means that DFJ has to filter out many more proposals in the early stage.

To avoid falsely rejecting radical but promising proposals, DFJ applies two evaluation heuristics. The first heuristic is that DFJ tries to learn from the large volume of proposals, believing that a technology breakthrough is more likely to happen in an area where many people are working on the same thing. DFJ's "magnet" approach enables them to hone in on more promising areas from the large volume of proposals they attract. While hiring many qualified evaluators to go through each submitted business proposal submitted is costly, this enhances the likelihood that DFJ identifies the next big *trend* and the eventual winning start-up within the trend.

The second heuristic is that DFJ invests in a start-up as long as at least one partner feels very strongly about the idea and avoids unanimity in investment decisions. Importantly, since this heuristic combats three components of the Mindspace framework (namely, *Norm*, *Affect* and *Ego,* e.g., we feel happier when others agree with us), it is set as *Default* for all investment decisions in DFJ. Because it is very costly to implement the "magnet strategy" and the "learning from large volume strategy", DFJ has to make sure they invest in the most radical ideas with potentially exceptional returns to justify the additional investment. By definition, radical ideas are against conventional wisdom and are likely to be discounted. If all partners agree on the potential of an idea, this idea is perhaps not radical enough. Research on group think[66] also suggests that discussions and consensus among partners may also lead to more risk-averse decisions, inconsistent with DFJ's goal. Moreover, competition will be more intense when commercializing such ideas because other venture capitalists may also see it coming. Instead of de-biasing their risk aversion and competition neglect using System 2 techniques, DFJ partners resort to *Default* to engage their System 1 thinking. DFJ believes that "the basis for investment decisions is not compromise but strong beliefs by individual partners".[65]

To conclude, in order to beat the incumbent venture capitalists in Silicon Valley, DFJ plays a contrarian strategy. When others act as brokers and link elites from different cliques to enhance the average quality of business proposals, DFJ acts as a magnet to attract a large volume of ideas to generate the maximum variance. When others operate secretly to protect their connections and insights, DFJ opens up and learns of the next big trend using the wisdom of the crowd. When others make investment decisions based on consensus, DFJ agrees on the basis of disagreement.

Implementing a contrarian strategy is risky. DFJ offers an example of *strategizing with biases*. They know their evaluations are likely to be biased due to homophily, risk aversion and competitor neglect. Instead of attempting directly to de-bias their decisions, they engineered the decision contexts to engage the several effects of Mindspace that can overcome the known biases that can hurt their goal.

Discussion. The DFJ case illustrates how a strategy in line with the Mindspace approach can not only benefit strategy implementation but can also be useful in managing more complicated strategic tasks such as search and innovation. This approach cannot guarantee that DFJ identifies the next "homerun" start-up, but it did help DFJ decrease the likelihood of betting on inferior options. More broadly, the Mindspace approach identifies the suboptimal decisions that can hurt both strategy implementation and formulation. Given the goal of DFJ, the suboptimal processes include our System 1 tendencies to imitate the most successful, to judge the more typical/similar more favorably, and to decide by consensus. By engaging other System 1 thinking forces, Mindspace helps to exclude the predictably suboptimal processes and enhances the chance that strategists can make a better decision.

DFJ's atypical decision process which avoids consensus is effective given their goal in the context of venture capital. They focus on the extremes rather than average quality. A related case was presented in a recent article published in this journal.[67] The game developer

Valve also "opened up" by hiring many atypical programmers to join their company; Valve implements a policy of "anything goes", i.e., allowing programmers to devote 100% of their time to a project of their choice. Valve then "learned from the crowd" by setting up a rule of three: the company allocates further resources and support to a project if the project owner manages to convince at least two colleagues to join this project (and to give up their own). In contrast to DFJ, Valve values consensus in the form of social proof. One important difference between DFJ and Valve is their goals – Valve cares about the average quality of their products where DFJ only cares about the extremes. Another key difference is that Valve needs to channel substantial resources into creating a new game, whereas DFJ are more focused on "picking winners" among existing ideas. This explains their different ways of strategizing with consensus – it depends on the context and the goal.

The cases of DFJ and Valve suggest that the application of Mindspace can be integrated into the design of organizations. The strategies of "anything goes" in the case of Valve and "deciding against consensus" in the case of DFJ are consistent with the design of a polyarchy in which an alternative is approved as long as one of the members supports it (even when all other members oppose it).[68] In both cases firms learn from the crowd: DFJ utilized volume in order to identify the next big trend, while Valve used social proof to identify and select projects of superior quality. These examples are also reminiscent of the well-known observation in organization theory that firms can increase exploration by introducing turnover and the ignorance of the newly hired may trigger learning by existing members that breaks the old equilibrium.[59] Why rely on ignorant new members instead of increasing the rate of exploration by existing members? One reason is that it is very difficult to convince individuals to explore novel alternatives. Instead of "de-biasing" individuals (making them explore more), the environment is changed (by introducing turnover) in such a way that behavior is indirectly changed.

Applying Mindspace in Strategic Contexts

In the previous section, we illustrated how Mindspace has been applied in two real life cases. The first case focuses on improving strategy implementation by setting defaults, given a formulated strategic goal. The second case illustrates how Mindspace can help with more complicated strategic activities such as competition, search and innovation. We believe that the Mindspace framework can also positively contribute to a wide range of other strategic tasks.

Consider a key corporate level strategy to change the scope of a firm: mergers and acquisitions (M&A). Studies have estimated the failure rate of M&A to be between 70% and 90%.[69] Failure is partly the result of overpaying: the winning bid is likely to be higher than the actual value of the target firms, a type of "winner's curse".[70] Higher bids are most likely to fail. The reason may be *Ego*: larger deals are often prompted by CEOs' desire for greater power, status, and bonuses rather than rigorous evaluations of synergies.[71]

How can bidding firms avoid making mistakes? Prior research has suggested ways in which executives involved in M&A deals can be de-biased,[72] but Mindspace offers an alternative approach. For example, firms can pre-*Commit* to two *Defaults* for all M&A deals: (a) at least three similar deals that failed should be presented; (b) every manager has to present a "pre-mortem"[73] by first imagining that the deal has failed and then working backward to determine what potentially could lead to the failure. These techniques can break groupthink (*Norm*) and remind people about the possible losses (*Incentive*) and attenuate the emotion associated with the fear of losing to competitors (*Affect*).

Consider strategic decision-making processes in typical business meetings more broadly. The *Messenger* effect suggests that companies should be careful not to overweight messages from people perceived to be more powerful and credible. To attenuate this bias,

firms can make the reports anonymous or ask the same person to present all of the reports in a meeting, thus forcing the receivers to focus on the quality of the message. People could also present the report of a randomly selected colleague, ideally without revealing its author. High status authors would be motivated to improve the quality of their reports because their content, rather than messenger, would now be crucial. Introducing some randomness in the decision-making process can thus enhance the quality of strategy-making because it can counteract our biases.[50,51] More obviously, anonymous voting on business decisions would reduce the power of *Norms*, because people would feel more able to express their own opinion without violating the expectations of the group, or of particularly powerful individuals.

The application of Mindspace can also be useful in competitive contexts. One example is identifying undervalued resources (such as superior talent) in order to outperform competitors. The *Salience* effect is a particularly powerful bias that may reduce performance. For example, a stereotype such as "graduates from elite universities are superior employees" is a salient cue for identifying talented workers. But even if the salient cue is valid to some degree, highly talented people with other backgrounds will systematically be overlooked. This stereotype bias is self-reinforcing when the cue is widely applied because there will be fewer available samples to correct for the bias. This suggests that opportunities may exist for a firm that actively hires people who do not fit the stereotype.

For example, the elite law firms in the UK are over-represented by graduates from Oxbridge. One possible reason is that Oxbridge degrees are so salient that CVs with this cue are more likely to be considered further in the hiring processes. Nevertheless, if it is widely used across major law firms, this salient cue can become sub-optimal. There will be many graduates from other schools who may be better than some Oxbridge graduates but law firms cannot uncover these "false negatives" unless they hire people that do not fit the stereotype.

A leading law firm - Clifford Chance – has tried to address this problem. Clifford Chance adopted a "CV blind" policy to counter the Oxbridge recruitment bias. By engineering the hiring context this way, the firm has managed to find many "hidden gems" in the underexploited pool of graduates from non-elite universities that their competitors were not considering.

The example of hiring against stereotype also highlights an enduring challenge for strategists: a tension between *Ego/Norms* and the maximization of profit. To enhance one's ego, one often has to conform to the existing *Norms* and to act in a similar way to others. This is likely, for example, to lead one being viewed positively by colleagues and stakeholders in the short term. Yet conformity with current *Norms* often reduces the likelihood of gaining competitive advantage, which requires thinking and acting differently, deviating from the *Norms*, doing something unexpected or even crazy in the eyes of the majority, being misunderstood even by close affiliates. In other words, competitive advantage is about winning big by doing something unconventional and going against the crowd.

To overcome the power of *Ego* and *Norms*, one can change the social context by isolating oneself to reduce exposure to social pressure. The basic argument in favor of isolation was best articulated by the American geneticist Sewall Wright, who posited that species adapt slowly in a large connected community.[74] Adaptation is more rapid when the species is divided into small subgroups (e.g., on neighboring but separated islands) with restricted interbreeding across groups. This isolation maintains genetic diversity and broadens the search for adaptive solutions. In product innovation, the idea of isolation has been applied to the design of R&D units into "ambidextrous" yet separate divisions that are governed by different rules, norms, and incentives. These units are often so-called "skunk works", which are both geographically and culturally distinct from the larger organization to prevent the paradigms of the larger organization quashing the R&D division's heterodox ideas.[75] For

instance, the mythical "Apple Car" is said to be under development in a top-secret facility, minutes away from the Apple's California headquarters. It is reported that employees involved in the project are asked to turn their official company badges around when entering the building so they will not be seen by members of the public. Creating and preserving such isolation may be strategically critical for harnessing thinking that is truly "outside of the box".

As another example, consider strategic mistakes such as overcapacity and excess entry. In the fiber optic cable industry, firms have sustained large losses when failing to take into account the expansion plans of their competitors and as a result laid more cable than the industry demand can justify.[76] Entrepreneurs similarly typically fail to realize that many others will enter.[77] These mistakes are the result of competitor neglect, and research in the de-biasing framework has suggested various remedies to avoid competitor neglect: from simply reminding managers to think about their competitors, to going through a checklist before making big decisions, to taking an outside view or playing war games.[78]

Recent studies suggest, however, that such a de-biasing approach may not be effective because competitor neglect does not necessarily arise from managers' lack of attention to competitors. Instead, the problem may result from an information asymmetry - managers have less information about competitors than about their own business.[76,79] Since firms have less information about their competitors than about themselves, firms are likely to underestimate competitors' opportunities and strengths, leading to an *overestimation* of their superiority relative to their competitors. This mechanism suggests why prompting managers to "first, consider the competition" is likely to be at best partially effective, because the problem is not managers *neglect* competition, but they *misjudge* the competition due to information asymmetry. [79]

Can the Mindspace framework help to address competitor neglect in strategic contexts? We propose the following to engage System 1 thinking processes to make

information about competitors more *Salient*. For big strategic decisions such as whether to enter a new market, firms should set a *Default* by elaborating three scenarios in which a particular competitor could win against you and seven scenarios about how you could win against that competitor. The exercise of constructing detailed scenarios is consistent with prior work on de-biasing competitor neglect[78] – it forces managers to put themselves in the shoes of their competitors. The *Salience* of the competitors decreases the information asymmetry between firms and their competitors and attenuates potential overestimation of their own firm. Moreover, our approach uses research on *Priming* to trigger a subconscious process that may complement the de-biasing approach: being asked to generate *more* reasons for a viewpoint can often make it *less* convincing.[80] Specifically, we ask for fewer scenarios in which competitors win because coming up with a few scenarios is easy, whereas coming up with many is more difficult and time consuming. Based on past research, we expect that after such an exercise a manager is likely to think: "I easily came up with three scenarios in which my competitors won, and probably there are lots more – perhaps they are better than I thought. But I struggled to come up with seven scenarios when I won, and some of those were pretty implausible – so perhaps I am not as good as I thought." A combination of the de-biasing approach with the *Priming* effect may attenuate competitor neglect and the "better than average" bias.

In addition, strategists could employ the *Incentives* effects in the following way: (a) stressing (*framing*) the potential losses from overcapacity thus triggering *loss-aversion*; (b) asking strategists to estimate the odds for overcapacity, which should trigger *overweighting small probabilities* especially if the estimated odds is small; (c) present the immediate losses (and corresponding odds) which should feel exceptionally aversive due to *present bias*, while the long term gains will be discounted; (d) *mental accounting* could also be used to discourage overcapacity by creating separate budgets for small short-term ("venture") and

large long-term ("expansion") entry. Spending from the latter is unlikely because the accounts are largely non-fungible and marginal propensity to spend out of each account is different; (e) *Ego* can also be involved by asking managers to bet, using real money, on which competitors is likely to win. By being forced to bet their own money, managers are likely to consider more objective reasons whether their choice is a wise one.

In sum, Mindspace can help improve strategic decisions in at least three ways. First, Mindspace can improve implementation given a formulated strategy. A well-formulated strategy can fail because its implementations are subject numerous biases. Our first case study on setting defaults illustrates how Mindspace can help to improve the implementation of a formulated strategy. Second, for more complicated strategic activities such as competition, search and innovation, Mindspace may not directly help to identify the "right" decision, but it can help to eliminate behaviorally naïve decisions. While an optimal decision is often context dependent and almost impossible to know before implementation, there are clearly suboptimal decisions - and Mindspace can help to exclude these. Our second case study illustrates how DFJ overcame biases such as homophily and risk aversion by employing several forces in the Mindspace framework. Third, Mindspace provides another option for alternative strategic thinking that can provide the necessary uniqueness required to differentiate from the competitors. This can help to outsmart the less informed competitors, which is critical in both competitive and corporate strategy. Mindspace can also be integrated into organizational design, to ensure that gains from better decisions are systematically captured.

Nudge resistance?

The Mindspace approach is developed for policy makers and has been demonstrated to be effective for helping people to make better decisions in public policy contexts.[5] However, skeptics worry that this approach involves an unacceptable level of paternalism.

There is an on-going debate on this issue in the policy arena, which has important

implications for implementing the Mindspace approach in strategic contexts. For example,

managers may resist nudges as they are supposed to make decisions rather than to follow pre-

determined options; indeed, managers may act against the nudges if they are aware that their

decision context is engineered. Moreover, if the "nudgees" feel that they are being exploited

by the nudgers, the nudges (and subsequent interventions) are more likely to backfire. Trust

may be destroyed and suspicion of future nudges will increase. Nudgers can instead gain trust

through transparently communicating that: (a) the nudgees, as human beings, are likely to be

fallible, make suboptimal decisions, and be influenced by System 1 forces; (b) suboptimal

decisions hurt performances; (c) performance can improve if nudges are implemented. The

more complicated the strategic activities Mindspace is applied to, the stronger the evidence

must be in order to support the proposed nudges; (d) the effects of nudges will be subjected to

ongoing evaluation and modifications to guard against potential negative effects.

Conclusion

The Mindspace framework focuses on engineering the decision contexts to improve

decisions and choices in order to provide better outcomes. We argue that strategists need to

pay attention to both "cognitive limitations" and the "structures of the environment", two

blades of the same pair of scissors (following Herbert Simon's analogy).[81] While traditional

de-biasing works on 'cognitive limitations', the Mindspace framework operates on the

environment. Better decisions can be achieved by engineering the environment to engage a

"good bias" to overcome a more damaging "bad bias". This new framework does not offer

easy solutions, since applying it requires strategists to have a profound understanding of the

strategic and human context. Neither does it provide definitive, evidence-based prescriptions

to strategists as its application to strategy is still in its infancy. However, we believe that it

does offer a promising, alternative toolbox to address key strategic challenges associated with competition, search, and innovation. It is our hope that Strategy researchers and practitioners alike will be inspired to provide more theoretical as well as empirical support to the idea that strategists can improve decisions by working with, rather than, against managers' intuition.

Table

Table 1

The MINDSPACE framework for behavior change (adapted from Dolan et al., 2012 and Vlaev et al., 2016)

MINDSPACE cue	Behavior	Psychological processes (and brain mechanisms)	Key references, particularly from the public policy contexts
Messenger	We are heavily influenced by who communicates information to us	Attraction (impulsive); Trusting (impulsive)	Durantini, M., Albarracın, D., Mitchell, A., Earl, A., Gillette, J. (2006). Conceptualizing the influence of social agents of behavior change: A meta-analysis of the effectiveness of HIV-prevention interventionists for different groups. Psychological Bulletin, 132, 212–248. Cialdini, R. B. (2007). Influence: The psychology of persuasion. New York: Harper Business.
Incentives	Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses and mental accounts	Greed (impulsive); Fear (impulsive)	Volpp, K. G., Asch, D. A., Galvin, R., & Loewenstein, G. (2011). Redesigning employee health incentives: lessons from behavioral economics. New England Journal of Medicine, 365, 388-390. Kahneman, D. (2011). Thinking, fast and slow. New York: Farrar, Straus and Giroux.
Norms	We are strongly influenced by what others do	Belonging (impulsive); Motor (habit)	Burger, J., & Shelton, M. (2011). Changing everyday health behaviors through descriptive norm manipulations. Social Influence, 6, 69-77. Cialdini, R. (2003). Crafting normative messages to protect the environment. Current Directions in Psychological Science, 12, 105-109.
Defaults	We 'go with the flow' of pre-set options	Fear (impulsive); Comfort (impulsive)	Madrian, B. C., & Shea, D. F. (2001). The power of suggestion: Inertia in 401(k) participation and savings behavior. Quarterly Journal of Economics, 116, 1149-1187.
Salience	Our attention is drawn to what is novel and seems relevant to us	Mental (habit)	Kahneman, D., & Thaler, R. (2006). Utility Maximisation and Experienced Utility. Journal of Economic Perspectives, 20, 221-234.
Priming	Our acts are often influenced by sub-conscious cues	Motor (habit)	Bargh, J.A., & Chartrand, T.L. (1999). The unbearable automaticity of being. American Psychologist, 54, 462–479.
Affect	Our emotional associations can powerfully shape our actions	Disgust (impulsive); Fear (impulsive); Attraction (impulsive)	Karlan, D., Bertrand, M., Mullainathan, S., Shafir, E., & Zinman, J. (2010). What's advertising content worth? Evidence from a consumer credit marketing field experiment. Quarterly Journal of Economics, 125, 263–305. Slovic, P., Finucane, M., Peters, E., & McGregor, D. G. (2002). The affect heuristic. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), Heuristics and biases: The psychology

MINDSPACE cue	Behavior	Psychological processes (and brain mechanisms)	Key references, particularly from the public policy contexts
			of intuitive judgement (pp. 397–420). Cambridge University Press, New York.
Commitments	We seek to be consistent with our public promises, and reciprocate acts	Status (impulsive); Motor (habit)	Bosch-Capblanch, X., Abba, K., Prictor, M., & Garner, P. (2007). Contracts between patients and healthcare practitioners for improving patients' adherence to treatment, prevention and health promotion activities. Cochrane Database Systematic Reviews, CD004808. Martin, S. J., Bassi, S., & Dunbar-Rees, R. (2011). Commitments, norms and custard creams – a social influence approach to reducing did not attends (DNAs). Journal of the Royal Society of Medicine, 105, 101–104.
Ego	We act in ways that make us feel better about ourselves	Status (impulsive); self-worth (impulsive)	Haley, K. J., & Fessler, D. M. T. (2005). Nobody's watching? Subtle cues affect generosity in an anonymous economic game. Evolution and Human Behavior, 26, 245–256. Ouellette, J.A., Hessling, R., Gibbons, F.X., Reis-Bergan, M.J., & Gerrard, M. (2005). Using images to increase exercise behavior: Prototypes vs. possible selves. Personality and Social Psychology Bulletin, 31, 610–620.

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24. The UK government set up the Behavioural Insights Team, known as the "Nudge Unit" in 2010 and it has enabled more effective policy implementations in various areas. For example, advised by the Nudge Unit, Court Service saves £30 million a year by sending people personalised text messages to persuade them to pay their fines promptly. The US government also set up the Social and Behavioral Sciences Team in 2014 and the Obama administration issued an executive order on 15th September

2015 directing executive agencies and departments to find ways to use behavioral science to change the way people behave to make government function more effectively and efficiently; There is much overlap but subtle differences between the Mindspace approach and the nudge approach (see endnote number 7, Dolan et al., 2012: 273-274). For the readers of this journal, we focus on the similarities between the two approaches and use the two terms interchangeably. .

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