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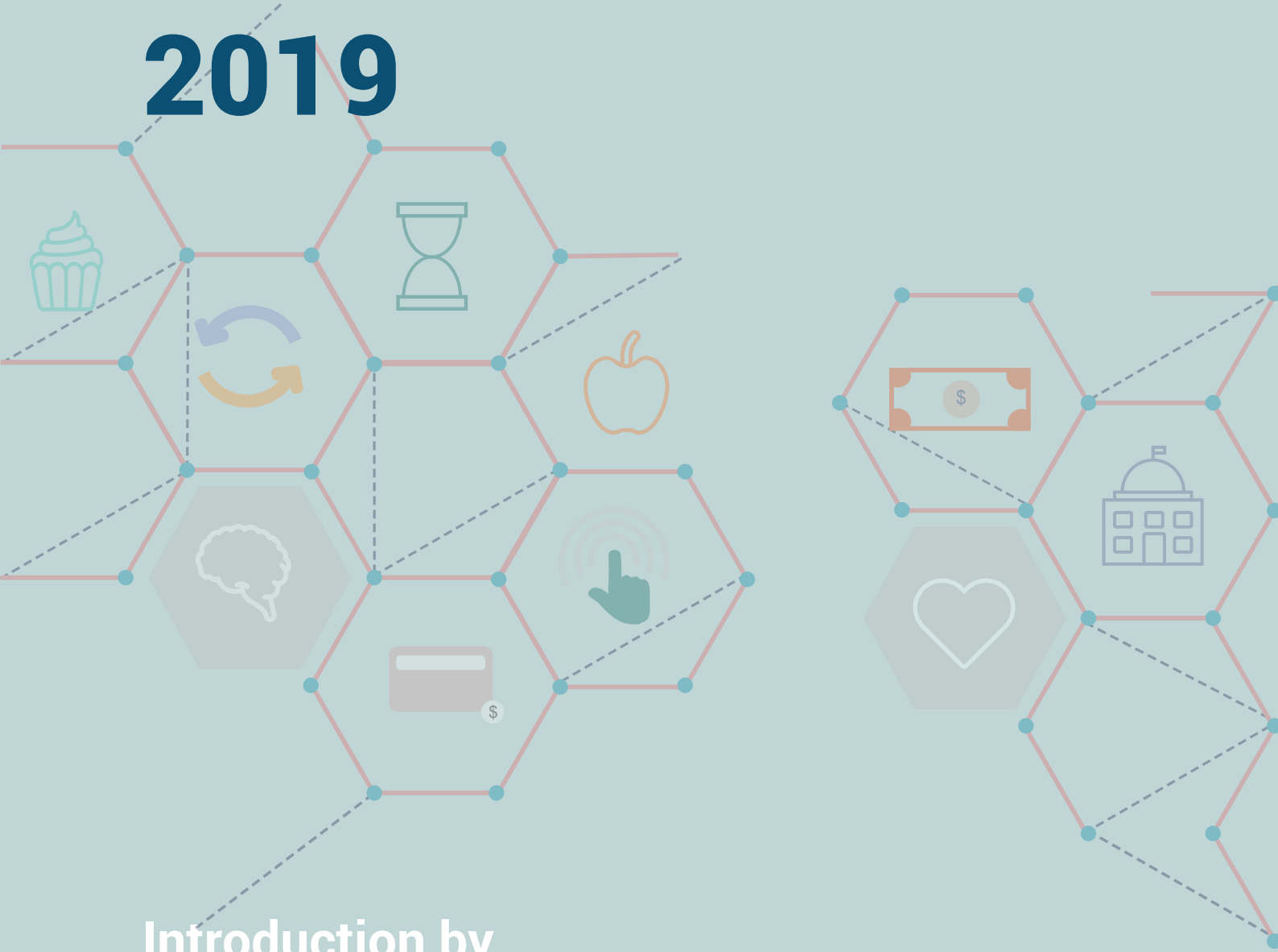

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INTRODUCTION

Incentives and Behavior Change

Uri Gneezy

Fifty-five-year-old John goes in for his annual doctor's appointment. One look at his doctor's face, and John can tell it's bad news. His doctor tells him he's 30 pounds overweight, pre-diabetic, and at high risk of a stroke. He is advised to take the prescribed medication, eat healthier, and, most importantly, walk for at least 30 minutes a day. John leaves his doctor's office with this new resolution, determined to change.

Flash forward to just two days later, and John's on the couch, watching reruns of his favorite TV show *Seinfeld*. The only steps he's taken are the ones on the short path from the couch to the fridge, for a cold bottle of beer.

It's easy to dismiss John, to scoff and say he's weak-willed or lacks self-control. But it's not just him. Think about the most common New Year's resolutions: Lose weight, eat healthier, exercise more. The fact is, many of us don't need to come up with original New Year's resolutions – we can simply use our list from last year. They don't seem so hard on paper, but in practice, behavior change is difficult.

John's couch surfing, just a couple of days after visiting his doctor, illustrates the challenge behavioral economists and policy-makers face when trying to use incentives to change habits. Can you think of a stronger incentive than the one faced by John? The incentive at stake, his health, is already so much higher than anything we can offer. He doesn't need to run a marathon; he just needs to walk for half an hour a day.

In this space, where the motivation for change is already so strong, we try to enter with our incentives. Before we discuss how incentives can make a difference, we have one point to clarify: Is the fact that people fail to change their behavior "irrational" (which is an economist's fancy way of saying "a mistake")? Is the fact that John doesn't walk half an hour a day a mistake? According to neo-classical economic theory, yes: People are perfectly rational creatures who can seamlessly incorporate and react to new information. The ominous prospect of multiple health problems should be more than enough of an incentive to get John off the couch and onto a treadmill.

My approach is different. I'm not here to provide a definition of rationality, or to judge whether something is a mistake. I ask a much simpler question: How can I help? I don't know if John is being irrational and making a mistake; I just know he wants to be healthier but can't get himself to do what's necessary, for one reason or another. When health insurance companies come to me and ask, 'Can you create incentives that will get John and others like him to exercise more?' I get to work. The challenge is to find a way to implement the behavior change, such that John will choose it. In other words, the behavioral economics approach as I see it is not to judge people or limit their choice set, but rather to change their perceived value using incentives.

Why incentives? Economics is based on the premise that incentives matter. Incentives can help by increasing or decreasing the motivation to take up a certain activity, by changing the cost or benefit of the activity. If someone were to pay John enough for each time he hit his steps goal, he would likely begin walking, perhaps even enthusiastically. After all, health consequences are in the distant future, but cold, hard cash can be given in the present.

In fact, many experimental studies have shown people adjust their behavior in response to incentives (e.g. Angrist et al., 2002; Ashraf et al., 2006; Charness & Gneezy, 2009; Friebel et al., 2017; see the survey in Gneezy et al., 2011). Pay John $1000 every day to walk for just 30 minutes, and he'll definitely do it. Most budgets, however, are fairly modest and don't allow

for incentives of this size. I aim to use incentives to motivate people to change a behavior they already know they should change, and do so with a limited budget. Our incentives can go a long way, particularly if the incentives not only change behavior in the short run, while the incentives are in place, but also help form long-term habits. Can we design incentives such that John will continue walking even after the incentives are removed?

This is one of the questions my forthcoming book on incentives, *Stakes and Mistakes*, addresses. A sneak peek: The literature seems to tentatively say yes, done correctly incentives can change behavior and form habits.

Four Ways to Use Incentives to Change Behavior

Agne Kajackaite, Stephan Meier, and I discuss four channels through which incentives can impact behavior change.[1]

1. Creating Habits

Incentives can be instrumental in *creating habits.* John wants to walk for at least 30 minutes a day. Let's say he chooses to do so at a gym. When he first visits the gym, he has a rough time. He struggles to walk for even 10 minutes, and he goes home sweaty and spent. He wakes up the next day extremely sore, still more flab than ab. But if he keeps going to the gym religiously, he'll build up his "habitual stock." Walking will become more enjoyable as the benefits become tangible, visible, and clear – he'll feel better and stronger in daily life, he'll lose a couple of pounds, and he'll actually be able to see the faint outlines of leg muscles. Once he starts walking for 30 minutes a day, building the habit is easy enough – starting is hard.

Incentives can help with building up this stock of behavior; they can help John start. If he earns a reward each time he visits the gym, he will have stronger motivation to start the process and continue his visits. He will eventually build up such a stock of walking behavior that he will be more likely to continue even after the incentives are removed. Indeed, experiments using incentives in exercise, starting with Charness and Gneezy (2009), show that paying people to start going to the gym pays off both in the short run and in the long run, after the incentives are removed. In these studies, a substantial portion of participants who started exercising because of the incentives continued to do so even after they were removed. The general rule we've learned is that incentives can help people start an activity, build up that habitual stock of behavior, and hence influence long-term behavior.

2. Breaking Habits

In the same vein as creating habits, incentives can help with *breaking habits*. John may be walking more now, thanks to the help of incentives, but his beer consumption hasn't changed, and his doctor isn't happy about it – he's advising John to lay off, if he wants to live to see the next rerun of *Seinfeld*. If past consumption can help create habits by building up stock, could reducing consumption "kill" habits by reducing the stock of behavior? Think back to the exercising example – enjoyment from going to the gym today is likely influenced more by gym visits from the past month than by gym visits from a year ago. If the habitual stock of behavior decays

[1] The discussion is based on Gneezy, Kajackaite and Meier (2019). This paper includes a more detailed discussion of the relevant literature.

over time, incentivizing people to stop a certain activity for a while can reduce the probability they will return to their old habits once the incentives are removed.

Empirical evidence supports this prediction. For example, Higgins et al. (2011) used incentives to encourage smoking cessation in pregnant women.[2] In the incentive treatment, participants earned vouchers for biochemically-verified smoking abstinence. As expected, the incentives reduced smoking in the short run. Interestingly, this effect was sustained for 12 weeks after discontinuing the voucher incentive: All the women in the control group, who were not incentivized to quit, continued to smoke, whereas 27% of the women who received the incentives to quit stopped smoking completely.

Creating habits versus killing habits are two sides of the same coin. In the same way that incentives can help build up a stock of behavior, they can also be used to reduce an existing stock of behavior. So how can incentives help break John's beer-drinking habit? If John were to receive an incentive for each day he drank only water, he might stop drinking beer, or at least break the habit of drinking a can first thing in the afternoon, when he gets back home. In other words, a potential way to kill a habit is to incentivize quitting an activity *for a while*. That way, the habitual stock will begin to decrease. The goal is to deplete this stock such that by the time incentives are removed, the stock will have decreased such that the activity is discontinued.

3. Providing Upfront Incentives

Providing upfront incentives may help in overcoming one of the most fundamental problems in behavior change: The cost is typically now, whereas the benefit is only in the far future. People often have what we call "present bias": They differentiate between immediate and delayed payment, discounting the latter rapidly. The benefit of exercising is far in the future and intangible, but the satisfaction from sitting and drinking a beer is immediate. Present-biased preferences help explain the difficultly people have with changing behavior, and also shed insight on how incentives could be structured and timed to overcome this obstacle. If John is an impatient person who wants to see benefits immediately, making the incentives front-loaded and not too far in the future might be worthwhile. Incentives given after a month of taking X steps per day would likely not be as effective as incentives given after a week of reaching the goal.

Milkman et al. (2013) pitch a clever way to overcome present bias: "temptation bundling." Consider, for example, allowing yourself to watch your favorite TV show only while exercising. Bundling this "should" behavior with a "want" activity could help make the immediate experience of the "should" behavior less painful.

4. Removal of Barriers

Incentives can help build habits by *removing barriers.* John lives in a very central part of town, and the gym membership prices are sky-high. Just covering the cost of a gym membership for John may be enough of an incentive to get him to walk for 30 minutes a day. Cappelen et al. (2019) showed that removing this barrier for university students was effective in getting them to exercise. In the experiment, college students in Bergen received a free gym membership (worth about $140) for a semester. Students given this incentive attended the gym more often.

[2] Incentivizing pregnant women to quit smoking seems sensible, even if they don't want to quit!

If you are not yet convinced that exercising is good for you, this paper found that exercising also improved academic performance.

Barriers can also come in the form of switching costs. Maybe John's problem isn't gym cost, but rather gym location. His gym is pretty far away from his home, but he doesn't want to spend time and effort looking for a closer location. His inertia imposes a procedural switching cost – switching would entail doing research on closer gyms, visiting, comparing costs, learning how and when to pay, and so on. Because these switching costs act as a barrier, John has stuck with the faraway gym he pays for but never goes to. Incentives could help here, for example, by subsidizing the closer gym enough such that John would be willing to invest in research and moving.

Incentives that reduce switching costs are not limited to the health domain. Many of the promotions we see in stores are based on this motive – think shopping habits. When we go to Target, we always choose the same brand of toilet paper. The first time we choose a toilet paper, we might invest some time in comparing options, and maybe we'll try a few different brands. Once we are happy with our choice, however, we simply repeat it, almost unconsciously. If Scott wanted to convince Charmin's loyal customers to try its brand of toilet paper, Scott might run an attractive promotion as an incentive. The Charmin customers might veer toward the Scott section when they observe the promotion. If they buy it, try it, and find they like it, Scott might become their new go-to toilet paper – even after the promotion ends.

Conclusion

The four channels that Agne Kajackaite, Stephan Meier and I outline are a way to organize thoughts on how incentives can be used to change behavior. A large amount of effort is devoted to trying to create long-term behavioral change in various domains, and incentives are often front and center. A small change to the incentive structure can have a dramatic impact – positive or negative – on outcomes. Hence, understanding how incentives interact with other motivations is key to the success of such efforts – think increasing health outcomes, productivity, environmental protection, and savings.

More generally, the behavioral approach is based on the assumption that people react to incentives, but we often do not understand how these incentives work. To increase the effectiveness of incentives in diverse areas such as behavior change, worker compensation, or consumer engagement, we need to first take a step back and understand what our goal is. Only then can we target the relevant people and figure out what motivates them; simple cash is just one way (and often not the best) to incentivize. Throughout all of this, we must remember that there is much we do not yet understand. We should constantly strive to monitor better and improve incentive structures.

My goal is to find ways to implement behavior change in an effective and scalable way. Incentives represent an important tool in achieving this goal.

The Author

Uri Gneezy is the Epstein/Atkinson Endowed Chair in Behavioral Economics at the Rady School of Management, UC San Diego. His early work on when and why incentives can backfire has become the cornerstone in a compelling line of research that explores when traditional economic theories fail to explain real human behavior. His research focuses on putting behavioral economics to work in the real world, where theory can meet application. As part of this, he works with companies to implement new incentives to employees and customers. His scientific work was published in top Economics, as well as general interest journals. Uri is the co-author of the bestseller book *The Why Axis*, and is currently working on a new book on incentives.

Gneezy received a PhD in Economics from Tilburg University, and a BA in Economics from Tel Aviv University. Gneezy was a faculty member at the University of Chicago, the Technion and the University of Haifa.

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EDITORIAL

Behavioral Economics: Ethics and Integrative Thinking

Nina Mažar

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'Behavioral Economics', 'Behavioral Science', 'Behavioral Insights', 'Behavioral Change', 'Nudge', etc. People all around the world, namely, experts and novices, academics and practitioners, policymakers and decision-makers, private and public individuals, use these various terms, mostly interchangeably.

As my last year's predecessor and BU Questrom colleague Robert Metcalfe wrote in his editorial, it is an exciting time to be in our field. We have seen Nobel prizes awarded to some of our field's brightest, with several reputable academics making our work more palatable to the mainstream through bestselling books and advising and collaborating with for-profit, non-for-profit, multinational, and government organizations to use behavioral insights to tackle problems ranging from voter turnout, to tax compliance, to healthy eating, etc. In fact, increasingly more companies and organizations are looking to apply insights from behavioral economics in their daily work: Internally with their employees (e.g. to reduce biases [Banuri, Dercon, and Gauri, 2018; Morewedge et al., 2015] or to increase diversity [e.g. Chilazi, Asundi and Bohnet, 2019]) and externally in client and consumer-facing projects (e.g. to understand whether consumers are paying off credit card debt as theory would predict [Quispe-Torreblanca, Stewart, Gathergood, & Loewenstein, 2019] or how to reduce credit card delinquency [Mazar, Mochon, and Ariely, 2018]). This in turn spurs the demand for our expertise and the creation of Masters and various other certificate programs in behavioral economics (see graduate programs listed in this publication).

A great deal has been written about the remarkable progress that has been made over the last few years in making behavioral economics a household name. Nonetheless, with fame and recognition also comes responsibility, which in turn requires humility and the willingness to self-reflect critically, and to question and improve, in order to get better and to rise to one's full potential. This notion is true for humans, but it is also for a discipline.

And as we as a discipline reflect upon our achievements and failures, as well as our potential and challenges, I believe two of the most salient topics for our field are – and will revolve around increasingly more so – ethics (defined in a broad sense) and integrative thinking. While I'm presenting them separately as distinct topics, for me at least, they are intricately connected and therefore will feed into each other.

Ethics in a Narrow Sense: Manipulation

Various debates have discussed government and multinational organizations using behavioral insights, and whether this approach is ethical. Some critics have warned that behavioral economics interventions can interfere with people's autonomy and thus be coercive and manipulative (Bennhold, 2013; Blumenthal-Barby, 2012, p. 352; Hausman & Welch, 2010, pp. 128-130; Reiss, 2013, p. 294; Wilkinson, 2013a, 2013b); for example, several organizations object to the use of default opt-in policies for organ donation, because they believe it may take advantage of vulnerable individuals (see discussion in Baldwin, 2014).

However, their objections relate not only to interventions: A recent publication (Meyer et al., 2019) showed that people are more likely to object to an experiment designed to test the relative effectiveness of two different positive treatments, before deciding which one to implement universally, than to have one of the two treatments universally implemented without comparative testing. This finding is robust among novices and experts, across domains ranging from healthcare, to improving recruitment, to poverty reduction, as well as among respond-

ents with varying degrees of educational attainment and scientific literacy. For example, in one scenario, "a hospital director[...] wants to reduce deadly and costly catheter-related hospital infections and thinks that providing doctors with a checklist of standard safety pre-cautions might help" (p. 2). One intervention consisted of having the standard safety precautions printed on the back of doctors' hospital ID badges, whilst the other intervention involved displaying a poster with the standard safety precautions in hospital rooms.

What is particularly puzzling about their findings is that these conditions are very different from, for example, the setting that sparked the outcry over Facebook's experiment with the emotional content of their users' newsfeed (Goel, 2014). Unlike the Facebook study that was designed to test how both positive as well as negative emotions spread on social media (Kramer, Guillory, & Hancock, 2014), across all the domains that Meyer et al. (2019) tested, neither of the treatments were negative per se, and the goal was always very clearly to improve wellbeing. These latest findings pose an interesting ethical dilemma for behavioral economists: On the one hand, we believe in the gold standard of randomized control trials as being – most of the time – one of the most unbiased and ethical ways to improve wellbeing, and yet the population whose welfare we want to improve may have strong objections about this methodology. I believe it is our responsibility to understand from where these opposing views about experimentation originate, in order to initiate actively a discourse and to encourage actions (e.g. the establishment of independent ethics review boards akin to those for academic research; informed referendums) to overcoming this tension.

Ethics in a Broad Sense: Long-Term and Side-Effects

Long-Term Effects

Less time seems to be spent on talking about how we ensure we assess the full impact of behavioral economics interventions to make sure there are no undesired side-effects and problematic longer-term effects. After all, if we want our intervention ideas to be taken seriously, be applied in the real world, and scaled up, we need to be willing to take responsibility for their consequences.

For example, it can be relatively easy, particularly online, to run some quick experiments, such as having an honor code displayed at the top or the bottom of an automobile insurance audit form, analyze the data, and learn that the reported odometer mileages are higher and thus likely more honest when the honor code is at the top of the form (Shu, Mazar, Gino, Ariely, & Bazerman, 2012). But what were to happen at the next audit wave if the company went back to their regular form with the honor code at the bottom? Would the single-shot intervention effect persist (Frey & Rogers, 2014), or, more critically, would it backfire and lead the same people who reported more honestly to compensate ("Licensing"; e.g. Monin & Miller, 2001) for their "losses" at the subsequent audit (see Ghesla, Grieder, & Schmitz, 2019, for a laboratory study of a default effect intervention on subsequent donation decisions)?

Brookmeyer et al. (2016) examined the impact of enforcement email interventions on tax compliance in Costa Rica, not only immediately afterwards, but also a year later (without any additional communication), and they found: (1) An immediate increase in income tax filing rates and payment rates and (2) that the effect persisted in the medium term. In a different context, the behavioral economics team of the Australian Government (2019) recently reported on an SMS message intervention program encouraging consumers who consistently paid only the

minimum of their monthly credit card debt, to repay more. Immediately after the experiment ended, as well as six months after the first SMS was sent, "those who had received a message had balances $249 lower on average than those who had not received a message ($10,374 versus $10,623). At twelve months, this result was even more pronounced, at $365 ($9,206 versus $9,571)" (p. 12/13). This result is astonishing, especially given that it could equally have been that the increases in repayments were offset later by reduced payments or increased expenditures.

Whilst examining the longer-term persistency of behavioral interventions is an important first step, another critically important temporal aspect of behavioral interventions is whether repeated exposure to the same intervention alters its effectiveness. That is, would the automobile insurance company in our experiment (Shu et al., 2012) find the same impact of the honor code at the top of the form if a client saw it again the next time the audit form was sent out, or would we find adaptation resulting in a diminished or even no-effect (perhaps even reversing)? I recently conducted an experiment with my co-authors Nicole Robitaille and Julian House (2018) with the Ontario Finance Ministry, where we tested the effectiveness of a repeated implementation intention-intervention on organizations' likelihood to file their overdue taxes. In addition to replicating our findings across two waves, we found no evidence of habituation to our intervention for companies exposed to our intervention over two consecutive years.

Does this mean this finding would continue to replicate in the years to come? Or would habituation only be a possibility if exposure to our intervention was more frequent than once a year? The response to such a question probably depends on various factors, one of which is to what extent do novelty or unfamiliarity contribute to an intervention's effectiveness, or to what extent are individuals motivated to not pay attention to an intervention? When it comes to questions of morality, for example, where individuals want to think of themselves as honest but are also tempted to transgress for some personal gain, being reminded of one's morals is useful (e.g. Mazar, Amir, & Ariely, 2008), but individuals will likely also try to not pay attention to these reminders so that they feel less bad about themselves if engaging in the transgression. Moreover, the less attention-grabbing an intervention or the easier it is to circumvent as one gains familiarity with it, the less effective it should become.

On the other hand, where undesirable behavior is due simply to forgetting, the more often a reminder, perhaps the better the possible outcome. For example, Lombard, Lombard, and Winnett (1995) tested the effectiveness of phone call prompts to increase walking, varying the frequency of these prompts. They found that participants who were prompted every seven days walked for significantly more weeks than the participants who were prompted once every 21 days – a statistically significant difference that was maintained over a three-month time frame post-intervention.

Side-Effects

Finally, one also needs to consider side-effects on other types of behaviors and/or other population types. For example, Tiefenbeck et al. (2013) demonstrated that those who received weekly feedback on their domestic water consumption lowered their water use but at the same time increased their electricity consumption. In another example, Damgaard and Gravert (2018) found that frequent reminders in a fundraising context, in an attempt to increase donations, also caused the hidden cost of canceled subscriptions by people who were annoyed about being approached in such a way. And yet in another instance, Anderson and Robinson

(2017) reported that those who had unjustly high beliefs in their financial literacy were affected negatively by a nudge that encouraged people to take care of their retirement savings. There are plenty more examples in the existing literature, and rather than summarizing them herein, I would like to refer the interested reader to the welfare section of my predecessor's editorial (Metcalfe, 2018, pp. 14-16) and to a recent contribution by Thunström (2019) on behavioraleconomics.com.

The main takeaway here should be that we need to be sensitive to an intervention's potentially differing effects on different behaviors and population types, and its efficiency in comparison to other, for example, more traditional financial incentives: Only then can we fully assess the importance and impact of our intervention. One nice illustration of such a comprehensive approach is a current working paper by Butera, Metcalfe, Morrison and Taubinsky (2019), in which the authors first develop and then empirically test (in the context of YMCA attendance) a framework for quantifying the social efficiency of social recognition programs. In a nutshell, they find that the crux of the issue is the shape of the underlying social recognition utility function, which determines the generation of deadweight loss.

Summary

Impact, net benefit, or welfare effect analyses are important steps we need to embrace humbly if we wish to make the case that the use of behavioral insights is important and meaningful. This requires not only taking into account the time dimension (in terms of both frequency of exposure as well as duration of effects) and immediate costs of implementation, but also broadening our view on the relevant dependent variables and considering actively – even if it may be impossible to be comprehensive and foresee every possible effect – heterogeneity and other behaviors and attitudes that could be affected.

This of course creates at least two challenges for us behavioral economists: (1) For how long a period should we track the effects of our interventions before we feel comfortable recommending one of them for universal implementation and (2) How can we ensure we consider all other behaviors and group types in the population when examining side effects? These questions may be viewed as unfair to some; after all, and in particular for question (1), shouldn't organizations willing to apply behavioral insights know that people and contexts are constantly changing and thus be equally willing to reassess regularly the effectiveness of their interventions and update the design of their policies, programs, or actions? To what extent, therefore, should organizations share some of the responsibilities outlined above?

Rather than trying to answer these contentious questions, the solution may lie in us taking the responsibility to be more transparent about what we know and what alternatives are available; after all, it's not a secret: People don't like uncertainty (Ellsberg, 1961) and believe that experts should know the one best course of action (Rozenblit & Kalt, 2002). This notion, however, clashes with the fundamentals of a behavioral design process that believes in experimentation, randomization, and iteration, and places the burden on us behavioral scientists to set expectations correctly, challenge status quo thinking, and apply a rigorous, comprehensive process with high standards to our problem-solving.

Integrative Thinking (and Doing!)

The former dean at my previous institution and "the world's #1 management thinker" (Thinkers 50, 2017: a biannual ranking of the most influential global business thinkers), Roger Martin, defines 'integrative thinking' in his book *The Opposable Mind* (Martin, 2009) as "the ability to face constructively the tension of opposing ideas and, instead of choosing one at the expense of the other, generate a creative resolution of the tension in the form of a new idea that contains elements of the opposing ideas but is superior to each" (p. 27).

According to Martin, "integrative thinking is at once a mindset, a methodology and a pedagogy for problem solving".[1] In essence, it is the way successful leaders think. Figure 1 displays how an integrative thinker in comparison to a conventional thinker works through the four stages of a problem-solving process. Fundamental to the practice of integrative thinking is the recognition that others may interpret a same situation very differently, and an openness to consider the value inherent in these differing views. This empowers integrative thinkers to solve richer, more complex problems in innovative new ways.

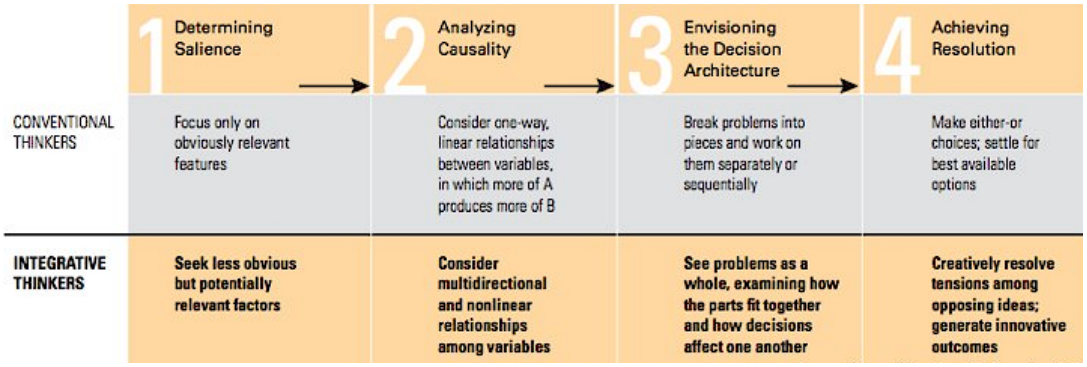

Figure 1: Conventional thinkers vs integrative thinkers. *Source*: Martin (2007), How Successful Leaders Think, *Harvard Business Review*.

Integrative thinking as a mindset is also useful for us behavioral economists seeking to increase the reach of our discipline. It is easy to fall into the trap of thinking in terms of *either-or* decisions, for example either a nudge or a financial incentive to create long-term behavior change (for a comprehensive overview of the latter, see Uri Gneezy's introduction to this year's Guide), or either a behavioral approach or a design thinking approach. However, the truth of the matter is that combining approaches, perspectives, and views may oftentimes allow not only for more impactful effects, but also the ability to solve more complex problems. In my view, only through the willingness to engage in integrative thinking and doing can we realize the full potential of behavioral economics.

[1] See http://www.rotmanithink.ca/what-is-integrative-thinking

Behavioral Economics or Traditional Economics?

Just recently, George Loewenstein and Nick Chater (2017) wrote an insightful paper "Putting Nudges in Perspectives", in which they focused in particular on the real tension between traditional and behavioral economics, as summarized in Table 1:

Rationale for intervention	Type of intervention		
	Traditional economic (e.g. taxes and subsidies)	Hybrid policies (e.g. carefully 'framed' taxes and subsidies)	Behavioral
Traditional economic (e.g. externalities, asymmetric information)	A (pure economic theory)	B	C
Hybrids (e.g. company optimally responding to consumer biases)	D	E	F
Behavioral economic (e.g. internalities, bounded rationality)	G	H	I (pure behavioral economics)

Table 1: A taxonomy of policy interventions. *Source*: Loewenstein and Chater (2017).

In their paper, Loewenstein and Chater (2017) made the intuitive but not necessarily self-evident point that the rationale for an intervention (market-level, structural factors such as externalities, misaligned incentives, and information asymmetries vs. individual-level factors such as internalities and bounded rationality) and the type of intervention (traditional economic factors such as taxes, subsidies, or regulations vs. behavioral elements such as framing) do not need to be of the same kind. Typically, when people think of behavioral economics, they think of problems grounded in humans' bounded rationality that are solved with insights from behavioral science (cell I in Table 1). But as Loewenstein and Chater (2017) point out, "economic problems may have behavioural solutions, and [...] behavioural problems may have economic solutions. Moreover, understanding many of society's problems and formulating policy solutions will involve hybrids between traditional and behavioural economics, rather than pure applications of either" (p. 48). Their paper is filled with examples and references for each of the cells in Table 1, ranging from smoking, obesity, and retirement savings, to some of society's most challenging and complex problems of our time, such as climate change, income and wealth inequality, and changes in the nature of employment.

In essence, hybrid approaches allow one to go beyond solving the so-called "last mile" problems (Soman, 2015). Going after low-hanging fruit and fixing a 'broken' policy such as retirement savings by changing defaults, introducing automatic sign-ups, re-framing messages, or sending SMS reminders is a good, important, and easy way to help people become better off. However, we should not shy away from a broader, more flexible mindset that allows for

behavioral economics to contribute to the "first mile" (see Soman's, 2015, p. 11: the strategy formulation and the program, product, or policy development stage; Loewenstein & Chater, 2017). As Ruth Schmidt (2019) wrote in her recent contribution to the *Behavioral Scientist*, in which she calls for the need for a systems view: "[...] when we fail to consider whether the system within which interventions take place is sound and equitable, and how correcting for one kind of change might leave out other important considerations or lead to unintended consequences, we risk optimizing behavior that perpetuates or amplifies broader systemic or cultural biases".

Behavioral Economics or What?

In order to give behavioral economics the chance to reach its potential fully, it also requires the willingness to engage in integrative thinking with fields and methodologies beyond standard economics. The social sciences more generally (in particular, not only psychology but also, for example, sociology and anthropology) as well as design thinking and AI are a few that easily come to mind.

Social Sciences

The social sciences focus more generally on the study of human behavior on various levels. The goal is to examine society and understand, for example, how and why humans and their minds work (psychology), how and why humans build and maintain social relationships and institutions (sociology), and how and why they interact and develop as a culture (anthropology). Behavioral economics as a discipline is grounded primarily in psychological insights (see e.g. Kahneman, 2011), thereby allowing us to change individual behavior successfully. However, we reach our limits when it comes to trying to change the behavior of entire groups of individuals, such as in the example of organizations, where additional factors such as hierarchy, power, responsibility, accountability, group identity, network effects, and many more play a role. In fact, even when it comes to decisions that are made in dyads, such as various intra-household financial decisions, we limit the effectiveness of our interventions if we target individual decision making only. Similarly, if we want to try to help address bigger societal issues like corruption, we need to understand the culture within which corruption is operating. For example, how did it develop, why is it persisting, what are people's views about corruption, to what extent is it generally assumed and accepted, etc.? In any of these examples, clearly it would be beneficial to familiarize ourselves with the insights taken from, and study methodologies used by, a broader set of social sciences.

Design Thinking

Design thinking draws on engineering and design methods to create innovation in product development and business processes. In comparison to behavioral economics, design thinking is comfortable with a much more holistic system view and, most importantly, with messiness and ambiguity, ethnographic exploration, and qualitative data. Messiness and ambiguity refer to the fact that design thinking is often used in settings where both the problem and the solution are unknown at the outset of the problem-solving process. Thus, even when the general direction of the problem may be clear, considerable time and effort are spent on defining and shaping the problem (Baeck & Gremett, 2012; Brown, 2008; Brown, 2009).

The reliance on ethnographic exploration, on the other hand, stands for a human values-centered approach that stresses open-mindedness and a willingness to approach a problem

without any preconceived notions. "Assume you don't know." This type of beginner's mindset is lost so easily in a behavioral economics project when we focus on the low-hanging fruit, recycling previously tested interventions without really questioning whether this is the right context for it, or entertaining other possible underlying issues that may be served better in a different way. For example, when thinking about how to protect low-income teenage schoolgirls in South Africa, who are three times more likely to be HIV-positive than boys in their age group, one could come up with all kinds of message interventions to try to persuade teenagers to not have sex, have less sex, or use protection. Yet, through extensive exploration, a team around ideas42 (Datta et al., 2015) found that the main culprits were 1) more teenage girls getting involved with older men and (2) misperceptions about the link between age and HIV risk. In particular, they found that teenage schoolgirls often – and incorrectly – identified older men as safer sexual partners, focusing on their financial situation and maturity as signs of responsibility and discounting the actual risk created by the higher number of potential partners older men will have had. As a consequence, Datta et al. (2015) decided to develop and test a computer-based "HIV risk game" that increased treatment participants' understanding of the relationship between HIV risk and age by 1.65 times in comparison to control, and which resulted in significantly longer information retention. The key to this shift in the problem definition came from the group's willingness and interest to understand South African teenagers within their cultural context, including the consideration of language, symbols, rituals, and other shared meanings that populate their world.

Finally, at its core, design thinking is about ongoing decision-making: "[…] you never really get to stop questioning the assumptions that you're making and that are underlying what it is that you're creating – those fundamental premises. Things change, you change, the market changes. And you have to have as part of your practice an ongoing process of revisiting those fundamental assumptions" (Altringer, 2017).

Artificial Intelligence (AI)

"Artificial Intelligence (AI), defined as a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation" (Kaplan & Haenlein, 2019, p. 15), can be characterized by intentionality, intelligence, and adaptation (for a detailed report see West & Allen, 2018). Today, AI increasingly influences our experiences and interactions in almost any walk of life. Intelligent algorithms can be found in areas ranging from autonomous vehicles, to portfolio choices, to healthcare, to virtual home assistants such as Google's Alexa, to social media bots that shape the selection of news we see, and criminal sentencing (Dressel & Farid, 2018). Given the ubiquity of AI in our daily lives, it is to some extent surprising that we haven't seen much of a connection with behavioral economics, albeit there is indeed a lot of value in that connection. In a way, we can think of Behavioral Economics 1.0 as testing the effectiveness of interventions to either increase a desired behavior or to reduce an undesired behavior, and then universally implement the best option. Behavioral Economics 1+X.0, on the other hand, uses AI algorithms with high prediction accuracy to suggest case-by-case, personalized interventions for individuals in situations where the best option may vary across people (for an interesting read in the context of bail decisions see Kleinberg et al., 2017).

Another possible connection lies in the use of AI in the search for new 'behavioral'-type variables that affect decisions (Camerer, 2019; see also Risdon, 2017, on the "Behavior Genome"). Particularly, the comparison of human and AI decisions, and the identification of commonal-

ities and discrepancies, can be informative and help us uncover new insights about less obvious, underlying psychological mechanisms and variables that affect human behavior. Thus, AI could help make the explorative phase of a behavioral economics project more effective, allowing for the development of innovative new ideas.

Finally, given the ubiquity of AI, behavioral economics can play an important role in helping to study human-AI interactions, to understand how it is perceived and used by individuals and institutions to reduce, exacerbate, or exploit human limits, and to learn how to use AI most productively (Camerer, 2019). This agenda ranges from the study of "algorithm aversion", its drivers (e.g. perceptions of uniqueness neglect), and ways to overcome it (e.g. introducing feelings of control or personalization; Dietvorst, Simmons, & Massey, 2016; Longoni, Bonezzi, & Morewedge, 2019), to understanding perceived and actual AI bias, for example, because of imperfections in training data or how data were collected (Kleinberg, Mullainathan, & Raghavan, 2017), fairness (e.g. through deliberately blinding a detention decision algorithm in terms of race and ethnicity; Kleinberg, Mullainathan, & Raghavan, 2017), and morality (see individuals' preferences and perceptions of conflicts of interest-decisions made by autonomous vehicles; Awad et al., 2018), the latter of which brings us back, full circle, to the issue of ethics and responsibility.

Conclusion

It is indeed an exciting time to be a behavioral economist. We are at a crossroads at which we can decide to either be satisfied with what we have achieved or challenge our discipline to examine more actively the impact and welfare effects of our interventions and broaden our influence and reach beyond the last mile to win a (more influential) seat at the policy and/or c-suit table. If we decide to go for the latter, we will need to consider the ethics of our actions and embrace integrative thinking, in order to demonstrate both accountability and responsibility.

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APPLICATIONS

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Behavioral Investment Banking

Using Psychology to Improve Advisory Business

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The reader of the BE Guide is likely to have made up his or her mind of the potential benefits of understanding human emotions and individual biases. The reader may also see that though many volumes of clever texts have been produced, we are generally stuck with theories and "some" understanding, we are still distant from transforming our insights into action, i.e. into enhanced behavior. This potential transformation sounds a lot easier than it is, but during the last few years I have participated in the building of a merchant banking boutique that was founded with the objective to build a "modern" investment bank, a bank with a focus on people. Our effort has been to take into account behavioral science insights and apply them to investment banking practice.[1] We did this because we thought the time had come for this interesting and challenging proposition in the finance industry. We were also inspired by John Keoron's build of BrainJuicer, now known as System 1 Group, into a premier consumer market research group which has become a shining star in an important market segment of behavioral insights into how people act and make decisions.[2]

Investment Banking vs Commercial Banking

Investment banking is different from commercial banking in that advisory and imminent risk management are at the center of value creation. While traditional banks make money by paying less for deposits than they charge for loans, the investment banks, or merchant banks as they have traditionally been called in Britain, would use their understanding of markets and businesses to underwrite share issues, provide complex bridge loans at high interest rates and advice on acquistions. As a result, the return on equity of investment banks would be superior to that of commercial banks, but this comes with higher risk, a risk that needs to be mitigated by excellent understanding of markets and clients. The investment banker would normally be well educated and have great social skills, enabling trust and a smooth relationship with important business decision-makers, such as CEOs and owners. Once, while on a pheasant shoot with the CFO of a Swedish multinational and an active user of the services of a particular US-based investment bank, I was informed that the main contribution of that bank was the provision of navigational comfort; the continuous flow of information about peers and capital markets. After all, the investment bank had the key to international capital markets. In brief, the CFO needed a flow of business intelligence to help maneuver the corporate vessel in a way acceptable to all stakeholders.

So, it is quite likely that the main benefit of a relationship with an investment banker is *not* the provision of smooth transactions – most banks can do that – but the provision of clever advice based on superior market and business understanding.

This also explains some of the key qualities of an investment banker: being higher in the societal hierarchy through education from prestigious business schools, being witty and socially competent, and – a fact which may be the key to providing sustainable advice – having an independent opinion that (frequently) comes from being financially independent. That is precisely how the client will get the best advice and not the advice that is just best for the banker's paycheck. The ability to take a contrarian position when necessary is a key quality of a useful advisor.

[1] The article refers to the build of Pinq Mango Capital Partners in Stockholm now part of Aalto Capital Group.

[2] Many insights from behavioral analysis and studies of consumer learning and behaviour are directly applicable to the finance industry.

Investment Banking: Towards a Behavioral Model

Let us start adding behavioral economics to the investment banking setup. Thinking that investment banking is challenging and often profitable, it becomes natural to investigate whether this attractive service can be improved by moving away from quantitative assumptions of rational behavior into an acceptance of human shortcomings, as well as applying insights into realistic decision-making processes. In short, can investment banking be sustainable with a careful application of behavioral science and can this behavioral investment banking model appeal in the long term to all the stakeholders and not only shareholders? A few areas need to be addressed:

Financial Decision-Making Is Not Different from Any Other Form of Decision Making (While Your Average Finance Professor Would Disagree)

Today, finance is a quantitative discipline with mediocre theories that were developed to provide an academic understanding of complex markets, i.e. descriptive models to be used in the quiet corridors of business schools, but markets – hungry for knowledge and quick fixes – use them as normative models. There are some great models, but they often have little or no actual relation to how people really think. Thus, however beautiful, the theories are in practice often useless as they have no connection to established insights about the psychological and sociological factors that influence the decision-making process of individuals, groups, and entities. Some important influencers go so far as to say that the traditional theories of finance have not just been useless, but even harmful to the public.

Decision-making is mostly a passive and unconscious process that is far from rational. It is important to understand that our tremendous brain-power delivers suggested decisions that are based on our desire to survive, so while we can be quite effective at securing our survival per se, we are often not very precise. In addition, since the brain's main focus is survival and it has limited access to resources, it takes shortcuts. We would like to think that we are great at forecasting and trend-spotting, while in fact we are close to being useless due to the lack of crucial internal resources. One implication is that our social abilities, along with the basic necessity of getting along with other people, make us very agreeable and subject to group-think. Professor Paredes' research (Paredes, 2005), for example, suggests that CEOs can become overconfident as a result of the extensive corporate control concentrated in their hands and the fact that they are rarely seriously challenged. As regards the latter, i.e. the ability to be resilient and, when necessary, take a contrarian and challenging approach, is a core quality of a useful behavioral investment banker. We should depart from the fast and dominant but passive thought processes, often referred to as System 1, and enter the exhausting and slow System 2 mode. This is when we can be logical, but in fact most people never take the time to *really* think; we are normally back-seat passengers while our emotions are in the driver's seat.

A truly useful behavioral investment banker needs to understand the biases and other weaknesses that influence his or her clients and the people involved in corporate development, mainly CEOs and CFOs. As an example, a vast research literature shows that people tend to become overconfident. As De Bondt and Thaler have noted, "perhaps the most robust finding in the psychology of judgment is that people are overconfident." (De Bondt & Thaler, 1995). In addition, there are a number of issues that need to be checked and scrutinized thoroughly when coming closer to a transaction. A basic checklist would look for advisor's self-interest,

availability bias affecting target selection, group-think or fashion trends among peer bankers or similar corporates, the CEO halo effect and insufficient worst-case scenario thinking:

A checklist:[3]

1. Tribalism. Which groups or identities (or narratives) have the strongest "pull" on the people involved? Although they may be "our" management team, the members may actually feel closer to other groups, including our counterparty in a negotiation.

2. Myths. Do we fully understand the theories we refer to, or do we in fact have a distorted and confused view of the theories and structures that we passively have agreed should be our guiding light?

3. Power. If we review the decision-making process that we are a part of, can we see that there are individuals that have in any way controlled the agenda or are safe-keepers of informal traditions, rituals and taboos? Are there in fact people using mechanisms of power to control our behavior? Think body language and manipulative behavior.

4. Confirmation bias. We tend to only see things and facts that support our case. We passively make up our mind early in all the decision processes. Maybe it is our laziness that forces us to make up our minds too early and then to be immune to any subsequent contradictory facts.

5. Halo effect. A successful CEO may have many important qualities, but we need to be aware that it doesn't mean that he or she necessarily knows everything.

6. Sunk cost bias. We need to be able not to throw good money after bad money and be able to walk away from a project irrespective of the resources previously invested.

7. Loss aversion/Regret aversion. This controls our actions every day and it helps if advisors assist in the prevention of stupid mistakes based on reluctance to take the pain of a loss, when it is necessary to do so. Advisors who are influenced by potential regret take less risk just because it might lessen the potential for poor outcomes.

8. Disaster neglect. Everybody needs to understand how probabilities are not useful when we in fact could come across black swans. We often think that the worst-case scenario is just a bad outcome, while the worst case is actually a disaster.

9. Availability bias. We need to understand that our low awareness of what is going on around us is resulting in our passive consumption of what others serve us. We need to actively think to get ourselves out of this useless state.

10. Saliency bias. We need to understand the connections we make: are they actually relevant? The immediate rewards of eating the cake are more visible than the long-term costs. The causal relationship between costs and benefits should not be based just on observed correlations that might have been formed due to biases and subjective judgements.

[3] Based on the article *Before you make that big decision* (Kahneman et al., 2011), and adapted by the author. Applicable to points 1,4-13, and 17

11. Affect heuristic. This has a strong connection to group-think and confirmation bias as we may get so excited with the merits of the project and the potential positive outcomes that we are unable to see any weaknesses. Step back: delay decision-making and revisit the project without this initial excitement.

12. Self-interest bias and self-attribution bias. What are the management's stakes in the proposed decision? A review of a decision from this angle may reveal a conflict of interest that results in sub-optimal outcomes for other stakeholders. In addition, managers who suffer from self-attribution bias would tend to attribute successful outcomes to their own decisions and negative outcomes to certain external factors and other people. These biases are expressed as a means of self-protection or self-enhancement. Managers affected by self-attribution bias may become overconfident.

13. Anchoring bias occurs when an evaluation or analysis has relied on certain numbers and the use of changed assumptions still showing a pre-determined outcome. A useful exercise is to triangulate the outcome with other numbers, other statistics and other assumptions and see where it leads us.

14. Disposition effect bias refers to a tendency to label investments as winners or losers, leading the management to stick to investments that may no longer have any upside.

15. Hindsight bias is leading managers to an ex post belief that the onset of a past event was predictable whereas, in fact, the event could not have been reasonably predicted.

16. Trend-chasing bias occurs when managers chase past performance in the mistaken belief that previous success based on previous practices and management decisions predicts future performance.

17. Overconfidence. We generally like confident people and it feels better to be with someone a bit overconfident than with an underconfident person. This is risky, as overconfidence has little or no connection to financial success.

18. Outcome bias. As periods of strong economic activity and optimism lead to positive share price development, management starts to assume that they have made some clever decisions. But the explanation often lies in the factors that are completely out of control (i.e. rising economic activity and optimistic market sentiment). Here comes the catch: at the same time as, positive outcomes become related to "leadership qualities", the negative ones are blamed on "circumstances" that were out of control – a paradox.

In conclusion, a useful CEO advisor understands that all decision-processes need to be scrutinized and that the assumptions about perfect markets and risk-return relationships are often naïve: we assume that we are emotional computers, while we in fact are somewhat logical emotion-carriers.

Understanding Corporate Governance

It is easy to develop myopia and try to resolve situations by quick fixes, while a useful advisor would provide sustainable and resilient solutions. One needs to weigh the short term over the long term. This involves a thorough understanding of relevant governance, the official and subtle objectives of the firm, shareholders' desires and instructions, the role of the board

and – all too often – the short-term desires of the CEOs. It is also useful to develop insights into boardroom tensions and the chemistry between the CEO and the Chairman of the Board. Understanding governance and long-term perspectives and combining this with advice is what builds a truly useful relationship between the investment banker and the client.

Process Surveillance

CEOs have very challenging everyday tasks and an increased transparency adds to these challenges. The investment banker needs to have the understanding and insights into the daily processes to be truly useful and, by taking a contrarian position, being the devil's advocate he or she becomes a trusted and valuable advisor, a guardian of the corporate processes. This is for many people a social challenge, as we all prefer to just be liked. This is also a role that can only be taken by the advisor that is truly independent, that has a financial standing and doesn't propose transactions for personal benefit.

Strategic Understanding Is More Important Than Transaction Acumen; The Advisor Needs a Holistic Approach to Corporate Development, Including Branding

Strategy, the understanding of markets, organizations and branding, is the flipside to structure, financial transactions and a transactional approach to mergers and acquisitions. This means that the most useful investment banker knows first and foremost strategy and branding, and this knowledge may in turn lead to structural change, a transaction. But this banker needs to see that transaction management is a commodity: most bankers can *do* them but very few can *see* them coming and see beyond them. So, while the bankers that focus on transactions are relatively useless, the bankers that focus on corporate development and understand strategy and branding will see the potential in structural changes.

Many companies pursue a full market valuation through increased investor relation efforts focused, in particular, on institutional investors. The assumption is that institutional analysts are rational and logical and, if they are fed with facts, value will come. However, analysts are people and as such are driven by their emotions. This means that the analysis is dominated by the emotions of the actual analysts – he or she is a human being, not a calculator. Readers with experience of scrambling to establish a discount rate for corporate valuations will testify to how haphazardly this is done at times, and how the discount rate can be used to support the desired outcomes. Therefore, in order to receive a thorough valuation analysis, it is wise to reach out to all people as unique individuals and try to understand what actually makes them like the target company. Below is an example of a company with low scores on financial risk and management. This does not per se imply, however, high financial risk and weak management – just that the perception indicates weakness. In this particular case, management felt that it was actually *removing* the perception of financial risk by communicating and describing various risks and how they are addressed by the company. This is a mistake based on the assumption that analysts are rational and as such will absorb the information about risk management rationally. However, the increased focus on risk communication implied, ironically, that there was a substantial underlying risk exposure. It would have been much better to focus on overall strategy, market share and all the positives and see how corporate perception changed.

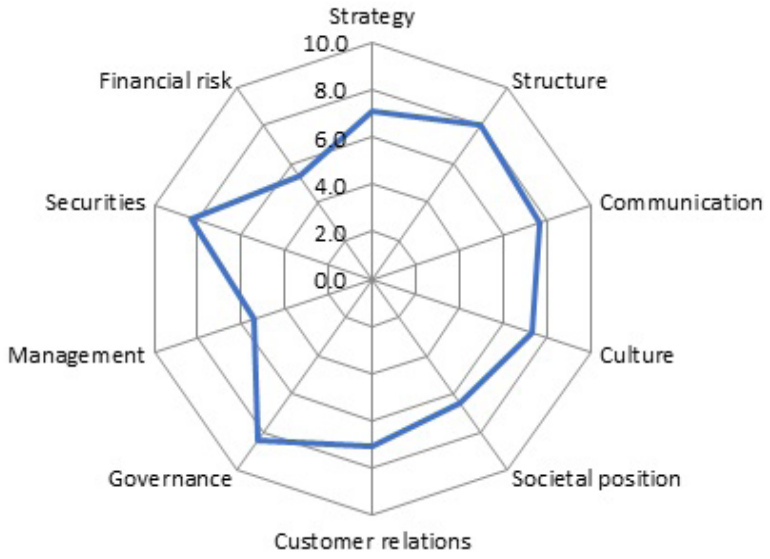


Figure 1: Example of a company scoring low on financial risk and management categories as a result of wrong perception management. The company's management intended to remove the perception of financial risk by communicating and describing various risks. However, an increased focus on risk communication made analysts believe, ironically, that there was actually a substantial underlying risk exposure.

To conclude, the clever banker will try to master perception management. This area lies closer to seduction than selling, i.e. knowing how to get the presentation and the timing right in a sale process.

Understanding Corporate Settings and Capital Markets

Continuous learning and ongoing contemplation about the situations that clients are engaged in is crucial for the useful advisor. We constantly come across investment banking advisors with a lot of naïve assumptions – as if it was only a numbers game, that companies can easily be merged, that corporate culture should not be a part of the valuation process and acquisition strategy and, first and foremost, that all industries are comparable. Being well-read and taking a humble attitude to the difficulties associated with expanding a corporation organically or through acquisitions makes it easier to be useful while avoiding the black swans.

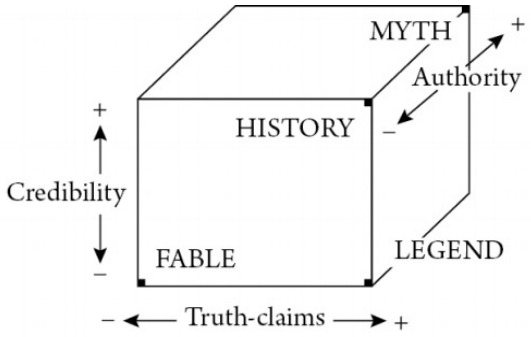
Long-Term Versus Short-Term

This may seem obvious, but it is an ongoing battle. We see it in business and financial news every day: CEOs are pushed to stimulate the share price by any short-term means necessary. Proper communication tactics can certainly increase product attention and create a sense that the company will soon be going places. However, even if this can lead to some immediate results, in the long term it is detrimental to reputation. The investment banker is in a perfect position to guide the CEOs and owners towards long-term optimal value-building, where the means are as important as the end.

Financial Myths

A typical finance class in a business school involves teaching the main theories such as the Capital Asset Pricing Model (CAPM) and shareholder focus in the spirit of University of Chicago Professor Milton Friedman. While these theories have been challenged and finance professionals know they are far from being precise, they are to date the best we have. It is therefore important to not take them very seriously and rather see them as a language; we know that our clients and counterparties have taken business classes and speak the finance language and the theories are therefore useful as references in discussions and negotiations.

Myths are generally man-made constructs that help us in understanding our complex environment, see image below, from Lincoln (2014). On a basic level, we often talk about fables and legends; we find them entertaining, but know they may not be very true. History provides a third dimension of myths and most people believe them unreservedly. In the fourth dimension are theories that assist in making sense of how the world evolves. This dimension includes most financial theories used today. The fifth dimension is paradigm myths. They help people explain their entire existence, so religions are included at this level. Finance can become a type of religion for some people. As many people first come across finance when they take their first finance class, they assume that basic financial concepts like discounted cash flow (DCF) are the only way to understand valuations and study finance. We detect this when we approach finance from a non-quantitative way and argue that DCF is not part of a human thought process.



	Truth-claims	*Credibility*	*Authority*
Fable	–	–	–
Legend	+	–	–
History	+	+	–
Myth	+	+	+

Figure 2: Myths are generally man-made constructs, and they possess both credibility and authority. *Source:* Lincoln (2014).

A critical study of finance theories can identify many alternative views:

1. Debt. Academics and traditional investment bankers appear to have a different view of the risks associated with leverage than the general public, including non-professional investors. Don't run with the herd, take a contrarian view.

2. Stakeholders. Move away from the ancient shareholder perspective of Milton Friedman and realize that optimal value comes from making all stakeholders satisfied.

3. Cost of capital. See beyond the concept of WACC and survey your stakeholders for their investment preferences. Decision-making is not a quantitative science.

4. Dividends. Don't follow peers unless capital is a real constraint, build a strong equity base so that the company increases its financial sustainability.

5. Advisors. Study the purpose of the company and resist strategic decisions that are solely good for accountants, the stock exchange, the journalists (as agenda setters) and other "corporate groupies".

6. Profit and cash flow. Move the discussions away from profit and focus on cash flow.

7. Tension. Understand the processes in the firm and make sure that the decision-makers don't prefer the easy way out over the route which builds a long-term sustainable company.

8. The value of a company. Using DCF provides great guidance to the relevant levels at which we will see actual transactions, i.e. at which levels price intersects with value. However, the assumption that we are computing machines is a naïve one, the emotional side of our brain is estimated to be 220,000 times our rational side meaning that we often prefer to act on our intuition (Kahneman, 2011). There are instances where a behavioral investment banker should leave the option-based or DCF-oriented calculations and simply ask experienced investors what they would be willing to pay for a security or for a company. This may be particularly relevant when future cash flows are uncertain but where there are other qualities inherent in the target entity.

Conclusion

The role of the investment banker in capital markets as risk-taking intermediary is important but can be additionally useful through the understanding of behavioral economics. The key is to improve the understanding of decision-making processes and how these are affected by human weaknesses. The behavioral investment banker would always remind management that there is a constant need to calibrate their "vision systems" to a System 2 mode. The challenge for the investment banker who wants to become more useful is social: how to remain a true, resilient contrarian for long enough (without being substituted for another advisor) to prove usefulness to the clients. A behavioral investment banker needs to practice perception management. It's not an easy task, but it is worth it.

The Author

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The Capacity Building Journey

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Introduction

To date, 202 Behavioural Insight (BI) departments have mushroomed across the globe (OECD, 2018), each unit is working hard towards changing its corner of the world. With such a burgeoning number of practitioners, we asked ourselves: What are the skills required for success? How can organizations cultivate them?

In our quest for answers, we conducted 12 interviews with subject matter experts (SMEs) rooted in government agencies, private companies, and academia. The principal lesson emerging from Australia to Mexico: Building a team's skill set yields powerful results when institutional capacity development is carried out (Grindle & Hilderbrand, 1995).

What follows are fundamental lessons learnt from in depth conversations with 12 subject matter experts, our experience, and secondary research. Our focus areas are: I) Desired Competencies, II) Unit Capacity Building, III) Institutional Capacity Development. Findings reveal there is no "silver bullet" to developing capabilities. A successful approach is highly dependent on the organizational culture, stage of maturity, workload, and institutionalization of the field. As is always the case, context matters.

I. Desired Competencies

Putting together a successful project team is dependent on including the right combination of people with complimentary skillsets. Halpern and Sanders identified six competencies that BI team members should possess; "understanding of government, knowledge of behavioural science, knowledge of policy and intervention design, analytical skills, interpersonal communication skills, and management skills" (2016).

Our research reveals an array of capabilities that closely match up with Halpern & Sanders findings. Strong BI units are resourceful, weaving a mix of in-house and outsourced capabilities. They house a diversity of talents within their own departments. Thereby, one individual need not acquire all proficiencies. Nor is it prescribed to hire one person per required expertise.

A. Behavioural Science Expertise

Practitioners have in-depth knowledge of BI principles and models from decision making, to identifying heuristics and biases, designing behavioural interventions, and creating recommendations. They are well-versed in the latest research and often experienced in designing experiments. Hailing from relevant academic backgrounds – Behavioural Science, Cognitive Psychology, Behavioural Economics, or Neuroscience – they are able to recognize structural vs. behavioural problems.

B. Qualitative Research

Designing an impactful intervention initially depends on carrying out field research, analyzing the context within which a problem lies, and identifying psychological or environmental triggers. The Department of Mobility in Mexico finds that qualitative researchers familiar with human centered design, a creative approach to problem solving used widely in innovation, are well suited to BI research as they usually have extensive experience in a wide range of methodologies that access the conscious and unconscious human thoughts (Giacomin, 2014).

C. Data Analysis

Armed with a sound grounding in statistics and data analysis, these individuals are an asset. Their role is sometimes viewed as parochial, with a narrow focus on mining quantitative data. However, it encompasses much more; determining the required experiment type to test interventions, designing an experiment, ensuring the robustness and rigor of sampling, and drawing meaningful conclusions from data analysis.

D. Sector Experience

Understanding the sector and context is a cornerstone to designing interventions, assessing their feasibility, and creating sustainable outcomes. In terms of public sector, an education in public policy is more valuable to BI when paired with hands on experience in policy development. Likewise, familiarity with diverse business industries is helpful when working on private sector projects.

E. Soft Skills

A core set of soft skills are essential for BI teams; proactive attitude, intellectual humility, curiosity, problem solving, solution generation, and empathy. Personal skills are industry agnostic (Strauss, 2017).

F. Project Management

A project manager holds the process together from A to Z, bringing in different expertise along the way. Agility, flexibility and experience in project management are just as important as creativity, the ability to work under pressure and successfully negotiate with collaborators. Depending on the context, a policy expert or consultant may take on that responsibility.

G. Communication

Communication in all its forms is paramount to this role. The terminology used with stakeholders plays a vital part in relationships and advancement of the BI agenda. In France, the Behavioural Insights Team found that centering discourse around 'impact evaluation' and 'efficiency', which was the focus of the government and the public, yielded higher success than using the academic and theoretical articulation typically associated with BI. Simple visual communication is also required when interpreting the results to stakeholders (Alqaisi, 2018).

H. Ethics

The widespread use of BI may well lead to sludges; interventions which have adverse and unanticipated consequences or that motivate individuals to engage in self-defeating behaviour (Thaler, 2018). In a field where the exact ethics are still being debated, experts agree the central questions for ethical use of BI must be instilled in all practitioners, as well as clear guidelines on the organization's policy. When is BI considered manipulation? What are the red lines which must not be crossed (Sunstein, 2015)?

II. Unit Capacity Building

Given the lean nature of BI teams and dynamism of projects, our research shows the lion's share of capacity building is carried out on the job, while formal training sessions are supplementary. What follows are the common tools deployed.

A. On the Job Training (OJT)

A three tiered approach is used in tandem to create a BI immersion; 1) Appreciate, 2) Analyze, and 3) Apply.

1. Appreciate

a) Literature review: Examination of published reports on trials form the foundation of new learning for novices. The Department of Mobility in Mexico found this technique beneficial while working on limiting the prevalent behaviour of failing to comply with road rules. Previous literature showed the use of monetary penalties backfired in limiting parents arriving late at kindergarten to collect their children, due to the "licensing" effect (Gneezy & Rustichini, 2000). Another study revealed a higher likelihood of recidivism among youth when financial fines were imposed (Piquero & Jennings, 2016). In comparison, traditional speeding tickets created a license for drivers in Mexico to break the rules instead of changing their behaviour. After context analysis, the team issued nonmonetary fines to speeding drivers comprised of community service hours, which resulted in a big win. Mexico City's Congress recently legalized the use of social service instead of monetary fines for traffic infractions and other administrative violations!

b) Book club: A book club offers a structured approach to reading the foundational literature in BI and discussing cutting edge reports. At the Saudi Health Nudge Team (HNT), they started with books such as Thinking Fast and Slow. These sparked healthy discussions between team members.

c) Academic engagement: The majority of our panelists mention BI teams work hand in hand with academia. In such instances, novices benefit from attending a periodic meeting between the academic and wider group. It stimulates their thinking, exposes them to cutting edge techniques, and provides a live reference point for ethical standards. Exchanges of ideas in such a setting is both nurturing and challenging.

2. Analyze

a) Fresh eyes: This type of lateral thinking approach is beneficial across different levels of experienced professionals (De Bono & Zimbalist, 1970). In this method, staff is encouraged to adopt a different perspective to a problem at hand, then take a fresh look at challenges. With this lens, they identify what could be done differently. Then, they devise a technique for tackling the issue.

b) Post mortems: After closing projects, learnings are fostered by reviewing what went well and what did not. At our BI meetings, we use a version of Phil Daniels' SKS method (DeLong, 2011), termed "start, stop, continue" (Hoon et al., 2015) to enhance the next project cycle. Individuals reflect on the assignment and identify three categories; what worked well (continue), what did not work (stop), and what could have been done to mitigate issued (start). In our experience,

examining failures with this lens aids in in identifying root causes of setbacks and future mitigation methods.

3. Apply

a) Cross-functional involvement: Regular check-in meetings remain a good opportunity to debrief team members on various aspects of a BI project. While one individual is updating on field research, another is discussing designing an intervention. Everyone in attendance gains an awareness of BI project stages and potential challenges across the spectrum. At Ogilvy Consulting, teams are encouraged to do more than just listen to each other, through a "30-minute pass" system. They are supposed to identify ways in which they can provide help to another stream. Each team member is allotted time per week – off of their official duties – to help others on different streams and push projects an extra mile. This builds up their skillset, by allowing them to be in a position of expertise, regardless of seniority.

b) Micro-behavioural projects: Small, low-risk assignments provide an opportunity for new joiners to learn the practical skills in a safe context. Through such undertakings, individuals are exposed to various stages of BI projects, from behavioural identification to policy recommendations. With time and increased contact, skillsets will be honed – and confidence grown – to commence more complex undertakings. During the early days of Nudge Lebanon and B4Development, they conducted an unsolicited search of small behaviours which could be changed and offered their support to relevant stakeholders. This created an opportunity for individuals to "try their hand" at small, low risk experiments, and see the project cycle through until the end. Three years later, Nudge Lebanon is tackling complex policy challenges at home and across the region.

c) Training others: The power of learning through teaching has been demonstrated in many studies, and it applies to BI (Koh et al., 2018). A method that many prescribe is encouraging BI unit members to carry out small learning sessions internally, and as their confidence grows, eventually move externally. Once they master a skill, staff lead trainings within the BI unit, followed by small stakeholder sessions. The Saudi Health Nudge Team took it a step further. They offered an opportunity to share learnings with the Minister, which created a buzz and even more excitement around the topic.

B. Blended Working Model

When working with consultants, a blended model approach is recommended to ensure a transfer of knowledge. There are three main pillars: Integration, Cooperation, and Expectations.

1. Integration

Incorporation of both teams across multiple stages of a project yields better results than consultants sitting in silos. In such instances a consultant and in house team member are paired on various streams. They are jointly responsible for leading the assignment.

2. Cooperation

While it is important to have a clear consulting scope and responsibilities, we have found that a spirit of collaboration is more conducive to knowledge transfer than a typical "vendor-client"

relationship. It is the client's role to input considerably throughout the project, as opposed to the traditional method of involvement at the end of a milestone.

3. Expectations

Setting KPIs that clearly illustrate the level of capability expected and when the handover from consultant to in-house team will take place enables a smooth transition. Consultants will work towards this goal, as they slowly phase out their employees. At the Western Cape Department of the Premier, the BI team initially started working with an outsourced consultant. Today, the in-house team takes care of the bulk of the projects. They only outsource to increase capacity. In their experience, 50% of time is spent on project management and 50% on knowledge transfer.

C. Formal Training

The general consensus is formal training provides a theoretical baseline, while OJT is a requirement to develop and hone BI skills. Three types of training emerge:

1. Behavioural Science Masterclasses

Masterclasses are provided by external entities, often time in remote locations and with other practitioners, outside of the organization. Durations range from 1 hour sessions during team away days to week long masterclasses. For those with little background in BI, these are a useful supplement to OJT, provided the timing is right. However, most prefer training take place after exposure to day to day workings of BI team and fieldwork. For example, the Western Cape Department of the Premier team attended ideas42's masterclass where they teach, among other topics, the DDDTS process. It stands for Define, Diagnose, Design, Test, and Scale (Robertson et al., 2017). This process is used today throughout the Western Cape Department of the Premier BI projects.

2. Tailored Externally Led Training

Sessions are often conducted by outsourced firms to transfer knowledge over a period of time to the BI unit or organization. Material is catered to the client's industry and presents attendees with an opportunity to work on live project cases. For example, Ogilvy Consulting have a host of tools they use with clients to bring them up to speed. These range from day long workshops to e-learning programs. In addition, they supply clients with two publications; "The Little Red Book" and "The Annual". They house a collection of behavioural principles and a summary of their behavioural case studies for the year, respectively.

3. In-House Training

Developed and delivered by the in-house BI team to their own recruits, and sometimes other departments, some respondents believe in-house programs are more effective than other methods. Nudge Lebanon finds this is a good way for new hires to gain initial learning, before embarking on an external masterclass.

III. Institutional Capacity Building

Developing institutional capacity is a vital precursor to success. All study participants emphasize the importance of lateral competency development, especially after BI proof of concept is verified.

A. Desired End-State

Whilst BI aims to promote change from citizens or customers, a systems-wide approach is needed to make these changes sustainable over the long-term. A key aspect of this broader method is the importance of developing more holistic mindsets in stakeholders, equipping staff with the tools to view challenges through a behavioural lens, and embedding the resultant new ways of working right across the organisation.

An example of this is Croydon Behaviour Change Hub's "T Shaped Professional" model. At its core (the intersection of vertical and horizontal axes) lies the subject matter expertise which each individual brings to the table. Mindsets required for sustainable change to occur are then listed on the vertical axis, while the range of typical skills and disciplines needed for successful and cost effective implementation of a holistic approach are shown across the horizontal axis. Please refer to Figure 1.

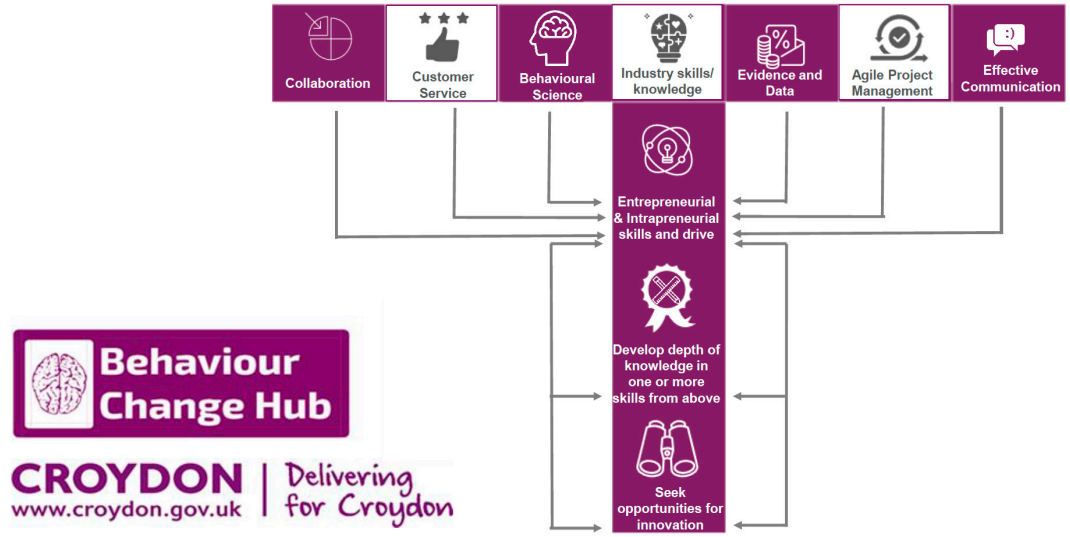

Figure 1: Workforce development – T shaped professionals

B. Capacity Building Methods

Target audience and desired outcome are precursors to the type of institutional training. Regardless of the chosen method, maintaining relevance remains paramount. This can be achieved via context specific examples, carefully articulating goals, and framing BI as a complement to existing systems.

1. Introductory Sessions

With an aim to provide a basic awareness of BI, introductory sessions are general in scope and short in duration. Topics include behavioural economics theory, successful examples, and possible quick wins at the organizational level. Depending on the organizational culture, some target high level management first, to gain buy in. A few entities include BI introductions as part of new recruits onboarding. Nudge Portugal's inaugural sessions were held in cooperation with well-known international academics and practitioners. This helps gain credibility while at its nascent stages.

2. Behaviour Selection Workshops

After BI is introduced, 1-2 day workshops are utilized before defining a project. They intend to teach stakeholders the difference between behavioural questions and others. Attendees filter out structural issues from behavioural ones, as well as identify micro-behaviours that need to be worked on. Western Cape Department of the Premier has found these are integral to successfully engaging stakeholders in behaviour selection and imparting knowledge about micro-behaviours and the step wise process to achieving lasting change. That said, there are instances where a formal step-wise process is not used.

3. Modular Training

To develop working knowledge, specialized modules – linked to the initial skillset a BI team determines – are deployed based on a training calendar. Subjects range from technical to general competencies, contingent on the unit's mandate and the target audience. For example, at the Behavioural Insights Unit in the Victorian Department of Premier and Cabinet in Australia, training topics include: running an RCT, project management challenges with BI project, and selecting the right research method for a policy problem.

4. Call for Projects

It is an indirect form of training which provides stakeholders the opportunity to scrutinize projects through a BI lens. By issuing a call for projects to determine which policy challenges would be taken on by the French Behavioural Insights Unit, they taught policymakers about the key criterion for considering a behavioural intervention. The criterion revolved around five themes; partner engagement level, ethics, behavioural vs structural issues, priority level for government, and publishing ability.

Conclusion

A capacity building journey is influenced by the organizational growth stage and unit's phase of development. At the start, skill emphasis is on BI fundamentals, communication, and keenness for testing. It is common to complement these with outsourced capabilities. As the unit grows, areas such as project management, visual communication, and data analytics are brought in-house.

The approach to up-skilling staff is highly dependent on the culture, workload, and institutionalization of BI. After the basics are instilled, practitioners require an opportunity to learn in the field, which often results in making – and learning from- mistakes. A failed result is not to be

lamented. Instead, it is a crucial lesson in what does not work. It poses an opportunity to tweak the approach and gain a better outcome when scaling.

Institutional capacity building is a critical part of the equation to induce the change governments and companies seek. Spreading a better understanding of BI among stakeholders ensures it will be used effectively - and ethically- in the areas it can make a difference, and circumvents the perception of BI as a panacea for all ills.

The next generation of leaders require a basic appreciation of the behavioural insights field. Cooperating with colleges to inform a cohort of behaviourally informed graduates – and laying the foundation for partnerships with other disciplines - widens the scale of the field's contribution into the fabric of future policies (Reid & Schmidt, 2018).

Lastly, it is imperative to embed BI ethics in every facet of capacity building. They must be refined and upheld along the way by those who practice BI to do right and retain the authenticity of this exciting field.

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Towards a Taxonomy of Behavioral Science Interventions

A Prism for Identifying and Evaluating Nudges in Practice

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Introduction

Since last year's issue of the Behavioral Economics Guide and our first presentation of "D.R.I.V.E. - a practical framework for applying behavioral science in strategy" the field has evolved rapidly, yet again. One decade after the first publication of 'Nudge' by Thaler and Sunstein, 2018 has seen more publications (14'400 new publications listed under ‚nudge' on Google Scholar, 21 linked to 'nudge' alone on HBR.org), more conferences (48 events listed alone on behavioraleconomics.com) and more government and private nudge units than ever before (Martin & Ferrere, 2017). Professional Service firms across the globe are attempting to frame new marketing, UX and data analytics approaches as 'behaviorally informed strategies'. Terms like heuristics, biases, nudge or choice architecture, in the past primarily used by academic researchers, have successfully entered the modern corporate and public policy jargon. One does not need to be an expert to observe that behavioral science has emerged from a niche discipline to a global phenomenon with decisive effects on the public and the private sector (OECD, 2017).

From the perspective of an applied behavioral scientist this trend is highly encouraging. However, it represents both a reward and a challenge for everyone interested in a serious intellectual, ethical and profitable development of the field. With the rising interest in behaviorally-informed solutions, the demand for simple, efficient and implementable interventions increases. While academia has revealed many relevant insights, some so prominent that they have reached headline and bestseller status, the discussion on how the innovative insights can be made more widely accessible and sustainable is still lagging behind. The field is therefore called upon to reflect on the future of behavioral science in modern organizations and its potential for strategy, design and communication (Bradon, 2019). Practitioners attracted to the field, need to be equipped with better tools to translate complex behavioral science theory into practice. For this, more intuitive frameworks and guidelines are required, allowing public and private policy makers an easier access and above all a target-oriented identification of behavioral interventions. Moreover, while the science should further our understanding of the effects of behavioral interventions through robust hypotheses-led research, it is time to consider partnerships with related disciplines to further increase the impact of behavioral insights (Reid & Schmidt, 2018).

Today, we want to contribute to this discussion by extending our previously presented framework for applying behavioral insights in strategy, D.R.I.V.E. as an acronym for D.efine, R.esearch, I.dentify, V.alidate, E.xecute, and proposing an easy taxonomy for behavioral interventions in practice. Bridging behavioral science with insights from habituation, healthcare, design, learning and change management literature, we present a simple prism for an easier identification and evaluation of behavioral interventions. On the basis of scientific findings and practical experience, this extension of our framework attempts to give new impulses to both researchers and practitioners and stimulate the further development of applied behavioral insights. In the following, we first address the importance of a step-by-step approach for designing behavioral interventions in private and public policy. We recapitulate why thorough behavioral and contextual research is vital for the selection and tailoring of interventions and how a step-by-step process can support in this process. Building on this, we will then present our prism for identifying, clustering and evaluating context-agnostic behavioral interventions in practice. We conclude with a brief theoretical integration of the prism into the D.R.I.V.E. framework and an outlook to future research.

The Context Matters

Probably the most important contribution of behavioral science is the insight that humans do not behave rationally in the sense of standard economic theory (DellaVigna, 2009; Kahneman, 2003). On the contrary, human judgment and decision making is mostly based on simple, fast and complexity reducing heuristics that may lead to systematic biases (Ariely & Jones, 2008; Kahneman, 2011). Human behavior can, independent of laws, incentives or information be altered in a predictable and preferable way through the intentional design of a decision maker's contextual environment, formally referred to as choice architecture (Thaler & Sunstein, 2008). The insight has opened up a completely new set of possibilities for policy makers and therefore attracted great interest across public and private organizations. Motivated to leverage the field's appealing and at first glance simple tools in practice, many strategists turn to the popular articles, books, mnemonics and visualizations about nudges and biases (e.g. The Visual Capitalist's Cognitive Bias Infographic) to make their strategies more 'behavioral' (Collins, 2016). However, it is important to select and apply nudges wisely in both private and political settings. The unconsidered and especially the unadapted use of behavioral interventions can easily lead to unexpected adverse consequences for individuals, organizations as well as whole markets (Thaler, 2018).

To avoid this, it is worthwhile to reflect upon the insight of bounded rationality again, affecting behavioral designers as much as their target audience. The effectiveness and appropriateness of available tools should be scrutinized carefully. For this, one should review and internalize the implicit minimum requirements for designing powerful and ethical behavioral interventions resulting from it (Soman, 2015):

Human behavior is context-dependent. Therefore, actions and contexts have to be analyzed in detail to determine the right starting point, scope, direction and feasibility of behavioral interventions. Nudges should not be applied without consideration of the context.

Behavioral interventions have to be tailored to the individual context. From the fact that behaviors and contexts are dynamic, it follows that behavioral interventions always require individual adjustment to the relevant circumstances. Universal nudges usually do not exist.

Behavioral interventions have to be tested and validated. From the fact that behavior is context dependent and every intervention unique, it follows that an evidence-based and hypothesis-led approach is required to test, learn and inform how theoretical concepts translate into practice. Nudging requires an open research-driven mindset.

In summary, applying behavioral insights in practice requires a context-agnostic, individual and experimental approach, ideally guided by a rigorous process to insure the effective translation from theory into practice.

The Framework Helps

Under this premise we have developed an integrative practical framework first presented in the last edition of the Behavioral Economics Guide (Emmerling, 2018). Building upon the various processes and mnemonics published over the last decade, D.R.I.V.E. provides a comprehensive yet simple logical problem-solving guideline for practitioners. It applies a context-agnostic and experiment-led perspective, along five consecutive steps (Figure 1):

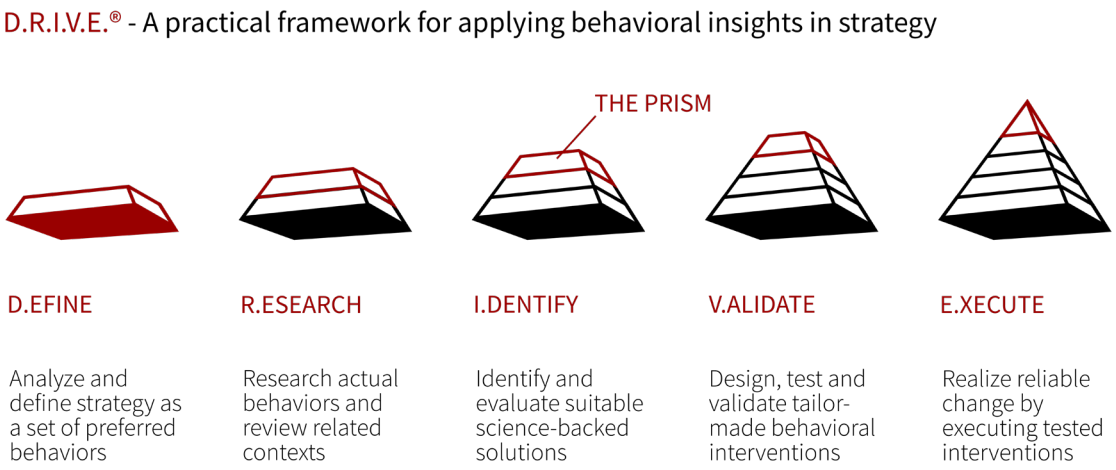

Figure 1: The five steps of the D.R.I.V.E. framework

D.efine strategy as a set of intended preferred behaviors. Moving from strategy A to strategy B requires a sustainable change in behavior of a specific target group. The preferred behavior as well as the differences to today's behaviors have to be captured and described in detail.

R.esearch actual behaviors and review related contexts relevant to their strategic challenge. Since behavior is influenced by contexts, a detailed mapping of the behavior-defining surrounding elements as well as an identification of critical behavioral hotspots is required to determine the right levers for behavioral interventions.

I.dentify, evaluate and adjust suitable and science-backed solutions. Proven behavioral interventions should be tailored and adapted to the previously researched context in order to effectively bring future behaviors in line with defined preferred behaviors. In addition to a contextual design, interventions must be intuitive, non-constraining and measurable to qualify as a nudge (Hansen, 2016). This element will be further elaborated in the next section.

V.alidate the selected interventions across a representative sample. The effect of context-specific behavioral interventions, and thus the successful transfer from theoretical concepts to practical implementation should be tested and evaluated using robust statistical methods. This critical step allows the further adjustment of the intervention and creates the relevant evidence for a following roll-out.

E.xecute behavioral interventions realizing behavior change on scale. The final transfer from sample to population brings the behavioral interventions to life and at the same time to its ultimate test. Motivating specific behaviors in dynamic contexts remains a complex endeavor. The gathered insights of the implemented nudge must thus be monitored and adapted and disseminated on a regular basis.

By following these five integrative steps, applied ideally with the support of outside behavioral scientists, practitioners can be sure to meet all requirements for applying effective behavioral interventions and to sustainably realize behavior change within an identified target group on citizen, employee or customer level.

The Identification and Evaluation Challenge

From our experience, the key challenge for most people interested in applying (more) behavioral science to their practice has been the identification and evaluation of the 'right' interventions as well as the 'right' starting points for their implementation. Following the definition of a strategic challenge in behavioral terms and researching the current behaviors, contexts, gaps and hotspots in detail, this third step is of significant importance for the success of behavioral science informed projects and policies. Human judgment and decision making is highly complex, dependent on different variables and often difficult to observe. In addition, contextual setups by which human behaviors are shaped are always individual and most often highly dynamic. It is thus difficult to universally define *what* nudge should be applied *how*, *when*, and to *whom*. Guidance for how to cluster, classify and combine behavioral interventions is needed.

When referring to behavioral interventions or nudges we mean 'a function of the choice architecture that alters people's behavior in a predictable way that is called for because of cognitive boundaries, biases, routines, and habits in individual and social decision-making and which works by making use of those boundaries, biases, routines, and habits as integral parts of the choice architecture' (Hansen, 2016, p. 158). But while the criteria for what constitutes a nudge have been established, the related literature does not yet provide the necessary resources to answer the aforementioned questions sufficiently. With the exception of Soman and Mazar's work (Ly, Mazar, Zhao, & Soman, 2013; Soman, 2015) as well as Hansen's recent publication for the OECD (2018) the majority of publications have primarily focussed on the detailed research of individual effects (Jachimowicz, Duncan, Weber, & Johnson, 2019) or a summary of different tools for practitioners such as MINDSPACE (Dolan et al., 2012), however not on ways to summarize and sort them. A comprehensive practitioner-oriented guideline for assessing behavioral interventions and starting points does, at least to our knowledge, not yet exist.

Against this backdrop we present a prism for better identification and evaluation of nudges in practice. For its development we drew from interdisciplinary research in fields related to behavioral science such as healthcare, learning and design with the intention to offer a comprehensive yet easily applicable tool for researchers and practitioners alike. It is designed to be used as a part of a process, e.g. D.R.I.V.E., subsequent to a detailed definition of preferred behaviors and a thorough research of the current behaviors and contexts (step 1 and 2) for the identification of suitable interventions prior to their validation and execution in practice (step 4 and 5).

The Prism for Identifying and Evaluating Nudges

The taxonomy has three different levels and can be imagined as a three-dimensional prism for analyzing behavioral interventions (Figure 2). The first dimension refers to the relevant behavioral level, i.e. the starting points for behavioral interventions. It differentiates between *triggers*, *motivation*, *capability* and *feedback*. The second dimension refers to the cognitive level a nudge is targeting i.e. the 'system' it is applied to. It distinguishes between the *unconscious automatic System 1* and the *conscious deliberate System 2* (Kahneman, 2003; Kahneman, 2011). The third dimension refers to the implementation level, i.e. the way a nudge operates in context. It separates between *adding new elements enabling* a target individual or group to achieve preferred behaviors and *removing existing elements blocking* an achievement of preferred behaviors. Taken together, the three dimensions offer a clear guideline for answering the afore-

mentioned questions, *what* nudge can *how*, *when* and *where* be applied to intentionally change behavior through a deliberate choice architecture. In the following the three dimensions and some related examples will be discussed in more detail.

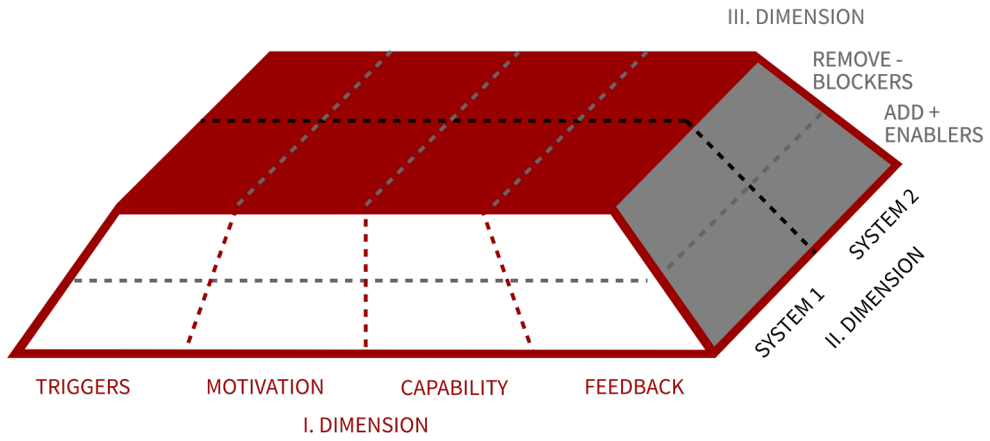

Figure 2: The prism for identifying behavioral interventions

I. Dimension: The Behavioral Level

The first dimension differentiates triggers, motivation, capability and feedback and supports the evaluation of nudges according to the different levers they can be tailored and applied to. So can preferred behaviors be initiated by contextual *triggers*, e.g. a visual prompt like a 3D pedestrian crossing (Schwab, 2017), by specific *(de)motivations*, e.g. creating commitment to long-term saving through an age-processed rendering of future self (Hershfield et al., 2011), by individual *capabilities*, e.g. the overcoming of cognitive boundaries such as the countering of ego depletion through the activation of positive mindsets (Tice, Baumeister, Shmueli, & Muraven, 2007), and by *feedback*, e.g. the provision of information about individual vs. social performance for example to reduce energy consumption (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007).

The segmentation of behavioral interventions in these four levers is informed by behavioral research on the forefront of habituation, healthcare, design and learning. Taking new vistas from other related fields into account the prism opens up a new comprehensive yet comprehensible perspective. According to Duhigg's (2012) habit model for example, repeated behaviors can simplistically be described by three consecutive steps. A cue or contextual *trigger* evokes a desire for a *reward* which is achieved by the performance of a specific routine or *behavior*. Triggers are quintessentially contextual and can according to Duhigg originate from a specific location, time, emotion, social setting or previous behavior (see also Dolan & Galizzi, 2015). Behaviors express themselves in target-oriented actions as a response to a trigger with the aim to realize an anticipated reward. Rewards are positively-valenced neurological reactions, i.e. pleasurable emotional states, and the fundamental motivation for the individual repeated behaviors. Repeated satisfying behavior creates a craving effect, leading to a learned anticipation of a reward in the trigger moment and a further enhancement of the stimulus to perform the positively-associated behavior. Contextual triggers, as the starting point for (repetitive)

behaviors, are thus of greatest importance for a sustainable and repetitive change in behavior. As discussed above, detailed behavioral and contextual research is a key requirement for the design of contextual triggers and the activation of rewards in practice.

In addition to Duhigg's (2012) sequential process, behavioral change models from the healthcare (Michie, van Stralen, & West, 2011) and design domain (Fogg, 2009) add valuable perspectives for the application of behavioral science in practice. According to Michie et al. (2011) behavior results from the interaction of opportunity (social and physical), motivation (automatic and reflective) and capability (psychological and physical). In line with existing behavioral science literature, Michie et al. (2011) extend the two levers *triggers*, i.e. the opportunity or call for action, and *motivation*, i.e. the automatically or reflectively drive to achieve an anticipated reward, by the lever of *capability*, i.e. the competency of a target person to act in a preferred way (Bargh, Gollwitzer, & Oettingen, 2010; Gilbert, 1991; Job, Dweck, & Walton, 2010). This reasoning is consistent with the behavioral design model of Fogg (2009) describing that successful behavior change requires the coincidence of a *trigger*, high *motivation* and high *ability*. Fogg argues that triggers fail to spark new behaviors when individuals have low levels of motivation or lack the right competencies to perform a new behavior. With regard to the identification and evaluation of nudges, Michie et al. as well as Fogg summarize that triggers, motivations and capability are three important dimensions when designing for sustainable behavioral change.

The fourth lever of the first dimension of the prism, primarily researched and discussed at the forefront of behavioral science in education and learning is *feedback*. It is relevant both for initiation as well as for sustained performance of a preferred behavior. On the one hand, feedback on personal performance compared to the performance of other people can produce a social comparison or standardization effect that leads to a change in behavior (Schultz, 1999; Schultz et al., 2007). On the other hand, feedback can moderate the long-term maintenance of a certain behavior, adherence to preferred practices and the commitment to behavioral goals (Kivetz, Urminsky, & Zheng, 2006). Following Hattie and Timperley (2007), feedback provides important information about an individual's or group performance on the action layer (e.g. eating a specific dish), the judgment and decision process layer (e.g. deciding on and planning for daily nutrition), the behavioral-self-regulation layer (e.g. maintaining a healthy lifestyle) and the emotional or affective layer (e.g. positive/negative feelings potentially unrelated to action). Across all four layers, feedback represents an important behavior regulating lever and should in addition to triggers, motivation and capability be carefully considered in the evaluation of behavioral interventions in practice.

II. Dimension: The Cognitive Level

The second dimension of the prism refers to the cognitive level and distinguishes the two different 'systems' behavioral interventions may target, or be applied to respectively. The distinction between a conscious, deliberate, controlled and effortful System 2 and a more unconscious, automatic, affective and effortless System 1 originates from behavioral dual-system theory (Evans & Stanovich, 2013; Stanovich & West, 2000). Propagated most prominently by Kahneman (2011; 2005) the notional bipolar distinction of two brain systems offers a simple yet powerful distinction of the cognitive levers in scope of behavioral interventions (Evans & Stanovich, 2013; Kahneman, 2011). While the majority of behavioral science research has focussed on the exploitation of cognitive boundaries mainly attributed to System 1, the targeted activation of System 2 in a 'corrective interventionist' form (Gilbert, 1999, p. 7) represents a powerful and often easy way to stimulate more preferred behaviors through a deliberate

executive overwrite (Evans, 2006; Kahneman & Frederick, 2002). In this sense may an intervention evoking a self-controlled debiasing represent an effective behavioral change strategy (Montibeller & von Winterfeldt, 2015).

In practice, the differentiation between the two cognitive levers supports an easier identification and especially a clearer evaluation of the appropriate mode of action and associated design of behavioral interventions. Triggers, motivation, capabilities and feedback can be addressed on an automatic and rather subconscious System 1 level as well as a deliberate and conscious System 2 level. Policy makers intending to design effective nudges should therefore clarify if a nudge activating level 1 or level 2 is more likely to show effects on a specific target group. In principle, different impulses can lead to similar results. However, the relevant contextual environment might require specific designs. For example, may a strategy to prevent data loss be tackled via a capability enhancing, System 1 based automatic saving cycle consecutively creating new file copies. If the technical environment does not enable automatic processes, the same goal may for example also be achieved by a feedback-loop requiring a deliberate System 2 reaction, such as pop ups asking if a new copy should be saved when attempting to close a file. In the same way may a strategy to improve worker safety in production plants be encouraged through behavioral science informed prompts triggering a conscious engagement with the importance of safety wear, e.g. through a visualization of family as an individual activator for a caring mindset, as well as through a prompt triggering the use of safety wear on more subliminal levels, e.g. through social comparison with safety-wear equipped work colleagues. Both cognitive levels should be respected and carefully evaluated in the design of behavioral interventions in practice. Again, a detailed research of the individual, social and environmental framework is required to design context-agnostic and therefore effective nudges.

III. Dimension: The Implementation Level

The third dimension of the prism refers to the implementation level and distinguishes between adding new enablers, i.e. new contextual elements provoking preferred behaviors, and removing existing blockers, i.e. contextual elements identified to prevent preferred behavior. In practice, behavior can be modified by contextual changes in both ways. While it is often easier and more conforming for policy makers to look for evidence that new elements are required to close behavioral gaps between current and preferred behaviors (Nickerson, 1998), a removal of behavioral blockers can often lead to more effective results. Nudges can, across all four behavioral levers (I. Dimension) and cognitive levels (II. Dimension), add an extra burden to decision makers, further complicating an already complex judgement and decision process (Sunstein, 2014). In this regard, the 'right' behavioral intervention can effectively consist of making a context simpler in order to make preferred behavior easier (Service et al., 2012 name ease as the first of the four factors within the EAST framework). Shortening of processes, elimination of unnecessary steps, freeing up of resources, changing defaults, offering options for auto-enrollments etc. hereby represent possible starting points. Although strategic simplification of contextual environments sounds intuitive and straightforward, it can be difficult to achieve in practice, especially in our complex modern world (Clayton, 2019).

In practice, simplification, i.e. the removal of behavioral burdens, can for example be a powerful lever to promote the enrollment in financial saving programs (Sunstein, 2014). Save more tomorrow (SMarT) by Thaler and Benartzi (2004), often serving as the light house example in this regard, has beyond tapping into hyperbolic discounting and loss aversion greatly benefitted from a simple and automatic default contribution whenever a person's salary is raised.

Instead of adding any additional features, the removal of the annual burden to fill-in forms and deciding on an annual saving amounts, can successfully free capacities and at the same time increase individual pension saving. The redesign of speed control signs in the form of smiling or frowning emojis offers another interesting example for a highly effective complexity reducing feedback lever. Leveraging the congenital human trait to identify and react to faces quickly and automatically (Pascalis et al., 2011; Taylor, Batty, & Itier, 2004), emojis can prove as a simpler yet more powerful behavioral intervention in an attempt to control speeding than regular speed cameras with numerical indications. Activating a social norming effect, people are likely to reduce driving speed to obtain a positive visual stimuli associated with smiling faces (Churches, Nicholls, Thiessen, Kohler, & Keage, 2014; Palermo & Rhodes, 2007). These examples show that both an addition and a reduction can prove useful in practice. While in one situation the addition of a new feedback device, e.g. the addition of 3D graphics side of the street offers an appropriate solution, the reduction of cognitive boundaries, e.g. the replacement of complicated processes of numerical data by emotion triggering emojis, might proof more effective in other situations (Hollingworth, 2011). Again, detailed research of the behavioral and contextual circumstances is required in to identify the right implementation levers for behavioral interventions.

Conclusion

Behavioral science has become a global phenomenon with major implications for public as well as private policy making. The interest in using behavioral insights in behavior change programs is growing steadily, as is the demand for practical application tools and guidelines. From our experience, policy makers and strategists are particularly looking for simple overviews that support the selection and design of effective behavioral interventions. Responding to this call, we have presented a comprehensive yet simple three-dimensional prism facilitating the identification and evaluation of behavioral interventions in practice. Intended to be used as an integrated part of a behavioral intervention design process, e.g. as the third step of the D.R.I.V.E. framework (Emmerling, 2018), it builds upon a clear definition of the strategic goal as a set of preferred behaviors and a detailed research of the behavioral and contextual realities. The first dimension of the prism distinguishes four behavioral levers, the triggers, motivation, ability and feedback that nudges can be tailored and applied to. The second dimension differentiates two cognitive levels, the unconscious affective and automatic System 1 and the conscious, controlled and deliberate System 2 that nudges can activate or be registered on respectively. The third dimension distinguishes two implementation levers, namely the addition of new contextual elements enabling preferred behaviors and the removal existing blockers preventing preferred behavior. Taken together, the 4x2x2 prism offers an easy theoretical framework for the identification and evaluation what nudge should be applied how, where and when to achieve an effective and ethical change in behavior. With this publication we attempt to contribute to and expand the theory on practitioner-focussed frameworks for applying behavioral insights. Behavioral science is an evidence-based discipline. In this spirit, the prism presented here should be subject to further practical validation by interested practitioners in order to further sharpen its dimensions and levers for the future.

The Author

Torben Emmerling is founder and managing partner of Affective Advisory. He is a behavioral scientist with more than ten years experience in strategy, project and customer relationship management. Torben holds an executive master's degree (MSc) in Behavioural Science from the London School of Economics, a master's degree (MLitt) in international business with specialization in scenario thinking and strategy from the University of St Andrews and a bachelor's degree (BA) in business and economics with specialization in financial management from the University of Basel.

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Behavioral Economics Assessments for Employees

A Novel and Powerful Concept

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The world of human resources (HR) management is facing important challenges. The new work scenario, which typically involves more creative tasks and more interaction with other (often unknown) people compared to previous times, requires managers and recruiters to make decisions based on elements beyond traditional competencies or hard skills assessments. In fact, information about employees' "soft skills", such as personality or communication/creative capacity, is becoming essential for companies and many HR departments have started measuring them in one way or another (Sackett & Walmsley 2014). These measurements are often applied to help managers predict who will be the most suitable person for a specific position. On the other hand, Behavioral Economics applications are being increasingly used in many areas of business and public policy (Ariely, 2009; Bhargava & Loewenstein, 2015). Yet, the experimental tools used by behavioral economists to infer people's characteristics, i.e. their "soft skills", have not fully reached HR departments and the public sphere (Espín et al., 2017).

Many of the Behavioral Economics advances on our understanding of people's behavior are indeed based on evidence obtained from lab and field experiments using economic games (EGs). It is thanks to EGs that we know, for example, that most people are not purely self-interested but have social preferences, that they often enforce fairness norms at a personal cost, or that losses tend to loom larger than gains (Fehr & Schmidt, 1999; Tversky & Kahneman, 1991). However, within the arena of HR management, the potential of EGs has received relatively little attention.

Behave4 applies EGs to HR assessments. These EGs are designed in such a way that participants' choices *reveal* their preferences in an incentive compatible and controlled manner. This is the case because in EGs people make choices with real economic consequences. We therefore infer the behavior of individuals from their choices, not from what they state. EGs elicit underlying behavioral preferences using abstract scenarios that avoid biased choices and ask directly about the origin of choice. Respondents cannot easily link the decisions they make to specific situations. And it is precisely due to the context-free nature of EGs that participants' responses may be more objective and less dependent on concrete experiences than in self-report assessments. Games require real incentives incentives, because otherwise people's decisions would be "cheap talk" and fail to reveal their true preferences/behaviors. Compared to self-reports, behavioral assessment techniques are less manipulable by the respondent. This does not mean that manipulation is not possible or that socially desirable responding does not affect assessments, but rather that their impact is reduced compared to self-reports. Of course, observability by our boss is a strong motivational force in any assessment. Yet, the characteristics of EGs make it more difficult for the respondent to figure out which behavior (i.e. which choice) the company expects. Note that if observability led to obvious socially desirable responses, then we should expect most people answering similarly. However, we observe rather high variability of responses, as it happens in typical experiments, meaning that expected responses are not so obvious and that incentives work.

Why behaviors? Even if it might sound a bit rough, companies are interested in how their people (will) behave, not really in how they are. Knowing how people are, ultimately, only matters for indirectly knowing how they (will) behave. Behave4's methodology directly measures behavioral preferences, which are the "true" underlying force for decision making. Preferences might not be completely rational but, fortunately, people are "predictably irrational" (Ariely, 2008). If you know preferences, then behaviors are predictable.

Compared to other types of measurements, such as cognitive skills or personality traits, which have received more attention in the past, the study of the validity of EG measures to predict in-job behaviors and performance is still in its infancy and more work needs to be done (Espín et al., 2017). However, we believe that each case is different and should be analyzed separately, and hence that often-heard claims that some worker characteristics can predict job performance across situations are to a large extent unjustified. Therefore, the lack of data from past research in this regard is not as problematic as it might appear. Following this logic, since the environment (both physical and social) matters and even sector/industry information may not be enough to predict who will perform better, we apply our *M.A.IN. framework* to predict the key performance indicators (KPIs) of interest in each company and environment, and use this information to design ad-hoc successful interventions. In fact, we often find that the best predictors of performance differ from one case to another.

Our M.A.IN. framework, which stands for Measurement, Analysis and INtervention, is represented in Figure 1. As can be seen, in step 1 we assess a set of previously-identified relevant behavioral preferences of a sample of employees (depending on the case, a relatively small sample, rather than the whole company's workforce, is sufficient to get meaningful insights) and obtain individual measures for all of them. The behavioral assessment is carried out in a digital environment through the *Behave4 Diagnosis* platform (https://diagnosis.behave4.com), where users can sign in with unique IDs and execute different types of predetermined EGs. In step 2, we analyze these data using advanced econometric techniques to infer which individual characteristics best predict the company's relevant KPIs (productivity, conflict, job satisfaction, team performance, etc.; see Behson, 2016, on the importance of proper performance measurement). The results of this analysis allow us to uncover not only who will perform better in a particular position but also the potential determinants for such differences in performance levels. For example, if after an assessment of employees' time preferences we find out that performance is higher among those who are more oriented to the long-run (i.e. more "patient" people), it might be that the incentives for better performance are too delayed so that they fail to motivate short-run oriented employees. In step 3, we use all this information to design interventions with a high probability of success. In the latter example, one possible solution based on "incentive architecture" would be to shorten the delay between performance and incentives in order to enhance the motivation of short-run oriented employees; a different solution, based on "people architecture", would be to assess the time preferences of potential candidates and hire the ones who are more long-run oriented.

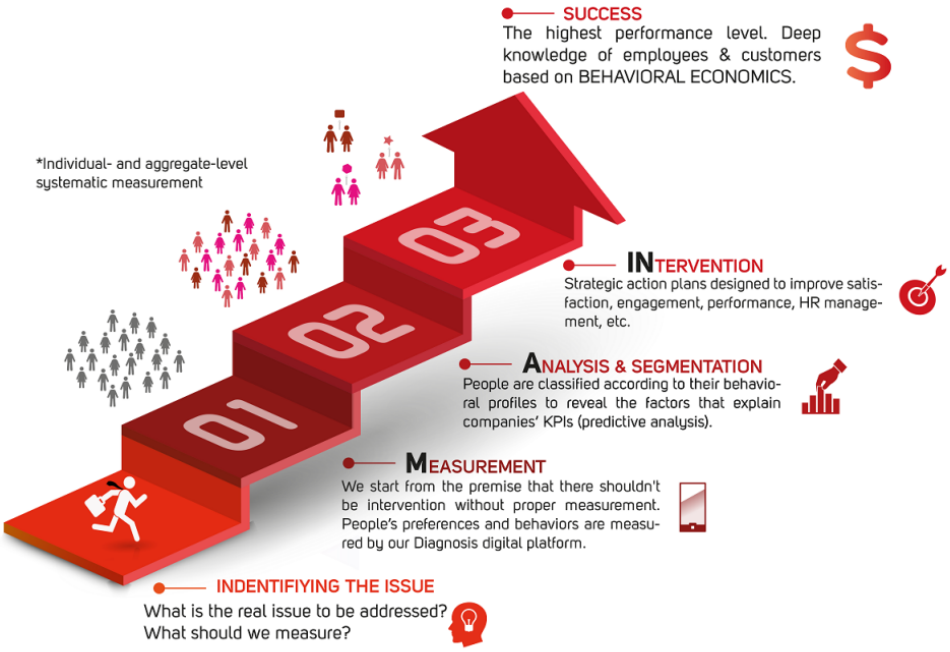

Figure 1: Behave4's M.A.IN. framework

Behave4 Diagnosis - Behavioral Assessment and Measures

The Behave4 Diagnosis platform has been designed by applying high experimental and Behavioral Economics standards. In essence, what the employees see on their screen is not very different from what any participant in academic experiments sees. Behave4 Diagnosis can in fact be used in academic research similarly to other platforms for conducting online experiments such as Qualtrics or oTree, and there are several research groups already using it for academic purposes. Perhaps the main distinctive feature of Behave4 Diagnosis is that many standard EGs are already programmed and ready-to-use, thus saving the researcher's time. The procedure is also alike any other platform: people enter their username and password to log in and are then presented a general instructions screen containing information about the basics of the experiment. After they accept the participation conditions, participants are shown the instruction set for the first task (i.e. EG), they make their decision(s) and proceed to the next task, and so on.

As mentioned, one of the basic advantages of Behave4's assessments is that participants make decisions with real economic consequences, as in typical Behavioral Economics experiments. Money is not an incentive for participation, as it is often misunderstood. Instead, people make decisions about real money in the games and can receive monetary rewards that depend upon their choices during the assessment and/or those of other participants. That is, decisions are *incentive compatible.* This is the case because only real choices can reveal real preferences. But, why money rather than other type of incentives? The main reasons are that money has nearly the same value for everybody (i.e. purchase power) and that it satisfies the mathematical property of monotonic preferences (roughly, "the more the better"). Therefore, money is by far the best currency to incentivize people to make considerate and comparable decisions

by allowing everyone to compute the costs and benefits of the different options available (Smith, 1976; Smith & Walker, 1993). Although there may exist valid alternatives to money in some particular cases, behavioral assessments should never use incentives that: (i) don't have a real value (e.g. "points"); (ii) their value cannot be quantified (e.g. public recognition or social rewards); (iii) don't satisfy monotonicity of preferences (that is, people clearly prefer $3 to $1, but probably don't prefer three sandwiches to one if one is enough to fill them up); or (iv) have different subjective value for different people or in different moments (e.g. a dinner at McDonalds).

Incentive compatible decisions reveal preferences and behaviors because the decision maker can achieve the best outcome to her/himself just by acting according to her/his true preferences and behaviors. All our EGs are built on incentive compatibility and have been adapted from standard tasks in the literature. Let us offer a couple of examples:

- In an EG that measures preferences for equity, there will always be an option such that, if a person is egalitarian, s/he will maximize her/his satisfaction by choosing that option. For example, "You are matched with another randomly selected (anonymous) participant. Please choose the option you prefer: Option A allocates $100 for you and $100 for the other person, whereas option B allocates $120 for you and $40 for the other person". Here an egalitarian person will lose $20 for choosing option A; s/he would thus be revealing a preference for equity. A series of decisions similar to this but that differ in the amounts allocated to each participant allow us to characterize the decision maker's preferences in more detail (e.g. to infer the maximum amount s/he is willing to spend to reduce inequity).

- In an EG that measures preferences for risk, there will always be an option such that, if a person is risk averse, s/he will maximize her/his satisfaction by choosing that option. For example, "Please choose the option you prefer: receive $100 for sure, or flip a (virtual) coin and receive $40 if it turns tails or $200 if it turns heads?" Here a risk-averse person will lose $20 in expected earnings by choosing the first option – because the second option has an expected value of $120 (that is, 0.5*40 + 0.5*200) – thus revealing risk aversion. By having participants make a series of similar decisions in which probabilities and/or amounts vary, we can obtain a more detailed characterization of preferences (e.g. how much money they are willing to sacrifice to reduce risk).

Once an employee completes all the tasks, s/he is either informed only about whether s/he is one of the winners, i.e. randomly selected to get paid for real, or whenever possible also about of the exact amount s/he will receive (payments can be calculated automatically by the Diagnosis platform in real time, but this is not always the case; sometimes calculations cannot be made until all participants have finished). Payment is typically made for real only for a proportion of participants selected at random (e.g. 1 out of every 10) and is computed using one randomly selected decision among all the decisions the participant made in the EGs, as this has been proven as a valid cost-saving payment method in economic experiments (Charness et al., 2016). This procedure minimizes careless decision-making (because decisions are made on relatively high amounts, in the range of $50-200) and reduces the total cost for the company given that not all participants and not all decisions will finally get paid.

Different options for paying participants exist. Depending on the agreement with the company, people can either be paid directly by Behave4 through a money transfer system (e.g. Paypal, Verse, Azimo, Bizum; for which winners only have to provide their email or phone

number), or can be paid by the company using its standard process to pay bonuses, or can even for instance receive vouchers with specific value to be exchanged for experience gifts or similar rewards.

Following the highest standards of Behavioral Economics research, in Behave4 we are firmly against deception of participants. All the information the participants receive during the assessment must be true, including peer-anonymity issues, payment procedure, etc. This is fundamental for the reputation of our methodology and its continuity. Participants should not believe, at the time or in the future, that something written in the instructions is false. If they choose to play a lottery in a certain game, for example, they must know that the lottery will be played for real, with the odds and amounts specified in the instructions. If this were not the case, after a few initial evaluations, the participants' answers would lack validity (because they will not trust the assessment anymore).

Finally, in Figure 2 we show our current portfolio of measures, whereas Figure 3 displays an example of individual report. As can be seen in Figure 2, we might obtain up to more than 40 different measures for each person. That said, assessments normally do not cover all possible measures as this would take about one hour to complete. Standard assessments gather information of about 15-20 measures and can be completed in less than 30 min.

Figure 2: Behave4 Diagnosis: Portfolio of measures

When the customer requires individual reports for the participants, which depends on the goal of the assessment, the Diagnosis platform represents the basic information for each person as shown in Figure 3 (depending on the customer's requirements as well, reports often contain extra information such as, for instance, short explanatory texts focusing on those measures that are more important or simply stronger). The score of the participant on each of the variables is displayed in terms of its deviation from a population average obtained in previous research. It is important to note that, by definition of our measures, scoring above or below the

average does not imply that the participant is performing better or worse. That is, preferences are not desirable or undesirable per se.

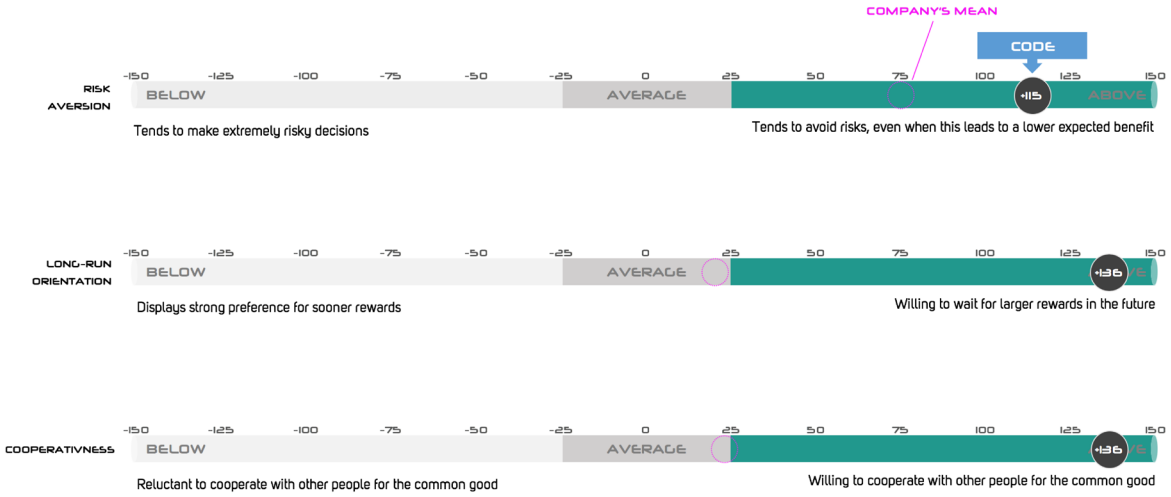

Figure 3: Behave4 Diagnosis sample report. "Code" denotes the individual's score; "company's mean" denotes a comparison benchmark of interest for the company (e.g. mean score in sector,industry, work center, team, etc). 100 points = 1 standard deviation of the population average.

Concluding Remarks

The potential of the experimental tools used by behavioral economists to infer the preferences of people has not received as much attention in organizations as other Behavioral Economics applications such as choice architecture and nudging. Behave4's previous experience indeed indicates that behavioral assessments provide a very powerful information source that can be easily integrated, along with more traditional elements, into HR policies. We hope that these lines stimulate this promising line of collaboration between Behavioral Economics consulting companies and HR departments. Please see the article "Behavioral Assessments Applications –Agile Teamwork: A Case Study" in this guide for further reading on this topic.

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Behavioral Assessments Applications – Agile Teamwork

A Case Study

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Why do some teams perform better than others? Faced with the same task, what are the elements that make one team function and deliver extraordinarily, whereas another team struggles, wastes time and obtains only mediocre results?

Here, we present a case study of the application of Behave4's behavioral assessments to human resources (HR) management in the field of teamwork. The data presented belong to a large project carried out in collaboration with a world-leading IT company whose employees work in squad groups using so-called Agile methodology (Fowler & Highsmith, 2001). We believe this is a relevant example because it provides a clear picture of the potential of behavioral assessments for HR management while also showing some important, recurrent challenges. Please see the article "Behavioral Economics Assessments for Employees: A Novel and Powerful Concept" in this guide for a methodological approach to behavioral assessments.

The Research Question

This section of the project intended to uncover the measures (i.e. the people's behavioral preferences) that can predict team performance within software development R&D departments in a European work center with more than 1,700 employees organized in 97 semi-autonomous squads of 10-20 people. With this information, the company's HR managers can make better data-driven decisions about how performance-based incentives should be defined or how people should be allocated into teams in order to maximize performance.

The Behavioral Assessment

A total of 425 employees belonging to 63 squads participated in an online assessment using *Behave4 Diagnosis* (https://diagnosis.behave4.com). This means that the participation rate was rather low (about 25%; moreover, only five squads have all their members assessed), which limits the scope of the analysis. The reasons underlying the low participation rate are multifold, but essentially related to the (unexpectedly) high workload at that time. Although particularly small compared to the population in this case, that the final sample falls short the initial target is not uncommon. Therefore, any research of these characteristics should have a risk management plan to overcome the problem of low participation and be able to obtain relevant insights under such circumstances. In particular, this fact prevented the Behave4's scientific team from performing powerful statistical analyses based on finding out which particular *combination* of behavioral profiles in a squad leads to the highest team performance. The study was therefore limited to uncovering the measures that, after being *averaged across squad members*, better predict team performance.

Participants completed a total of 13 tasks (i.e. economic games) in which they made decisions with real monetary consequences, as it is standard in Behavioral Economics experiments. 30 measures were obtained for each employee. The average participant took less than 40 minutes in completing the assessment. One of every 10 participants were randomly selected to receive real payment from one randomly selected decision (average earnings ≈ €45).

Analyses and Results

Before running the assessment, we provided the company's HR managers with the definitions of our main measures and asked them to rate each measure according to its expected desirability in their teams. In Figure 1 we show the (average) desired behaviors/preferences

in Agile squads, as defined by the company. Put differently, the company did the exercise of guessing which measures should predict team performance. It can be seen that HR managers expected that the best-performing squads should be mainly composed of individuals with the following characteristics: high long-run orientation and cooperativeness, and low risk aversion, loss aversion and envy (although other measures such as cognitive skills and analytic thinking are also relatively important).

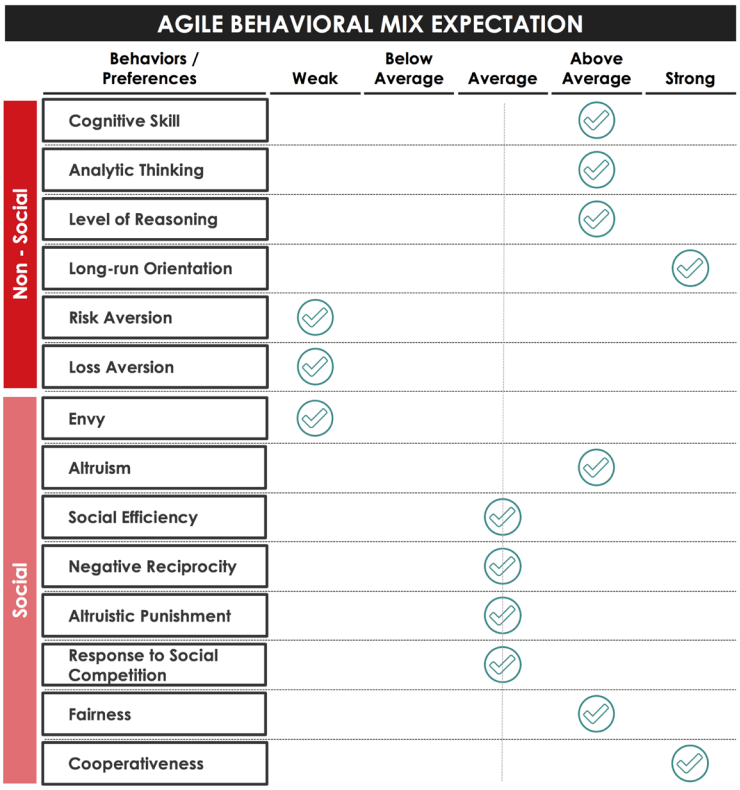

Figure 1: Desired levels of behaviors/preferences in Agile squads according to HR managers

In parallel, the company provided us with the values of their relevant key performance indicator (KPI) for each team. However, due to the definition of the KPI variable, different development units (i.e. groups of squads doing similar work) displayed significantly different KPI values. To be able to manage these data in a meaningful way, we normalized squads' KPIs to the average KPI in the development unit they belong to. With this procedure, we defined "standardized KPIs" which are comparable across development units and can therefore be used in our predictive analysis.

We fitted an econometric model in which the squads' standardized KPIs are predicted as a function of the average characteristics of the squad members. This analysis accounted for the fact that some teams had only a few members assessed by giving weights to squads according to participation rate so that such teams lose importance in the estimation. Figure 2 presents the main results (the size of the circles reflects the within-squad participation rate, i.e. their weight on the estimation). After several robustness checks, we found that those squads with more long-run oriented and more cooperative individuals perform relatively better. These results are in line with recent research (Carpenter & Seki, 2011; Espín et al., 2017) and, interestingly, also with the company's expectations (see Figure 1). The top panel of Figure 2 shows the predictive power of our final algorithm combining both variables (R^2=0.16, p=0.002), whereas

the bottom-left and bottom-right panels show it for long-run orientation (R^2=0.10, p=0.01) and cooperativeness (R^2=0.06, p=0.05), respectively.

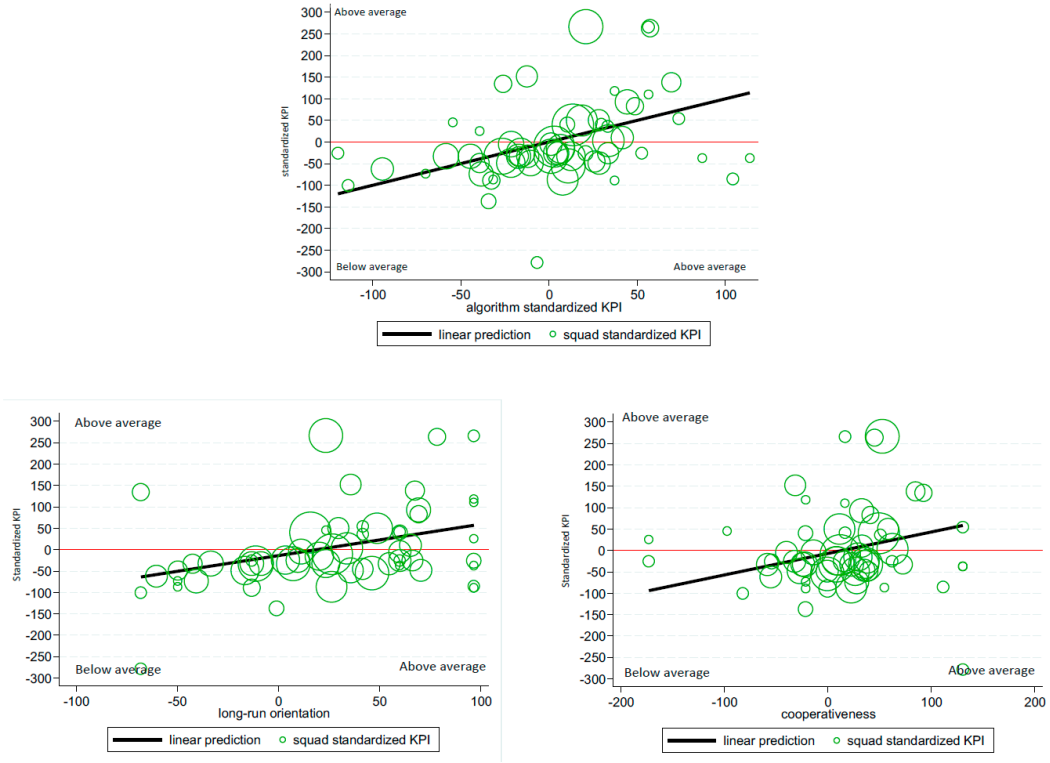

Figure 2: Squads' standardized KPIs as a function of average long-run orientation and cooperativeness combined (main algorithm definition; top panel), long-run orientation only (bottom-left panel) and cooperativeness only (bottom-right panel). 100 points = 1 standard deviation of the variable.

Data-Driven Recommendations: Simple and Straight to the Point

Behave4's main recommendations from these results were the following: (i) allocate more long-run oriented and cooperative individuals into high-priority squads; (ii) hire those candidates with higher long-run orientation and cooperativeness; (iii) reduce the delay between performance and performance-based bonuses (i.e. distribute bonuses quarterly instead of yearly) to further motivate short-run oriented people; and (iv) create a more cooperative environment with elements that increase the perceived cooperativeness of other employees.

Concluding Remarks

Appling our *M.A.IN. framework* to teamwork in Agile squads, we first *M*easured the behavioral preferences of a sample of employees, and then *A*nalyzed the link between team performance and team members' characteristics to uncover the variables that predict performance. With this information, we recommended a number of simple *IN*terventions to maximize performance by focusing on the causes of performance differences between squads. Note that hundreds of possible interventions exist. Our previous measurement and analysis allowed us to reduce the set of recommendations to just a few, easily applicable interventions with

high probability of success. In any case, whenever possible, we also recommend evaluating the effectiveness of the solutions by A/B testing (i.e. Randomized Controlled Trials), that is, applying these interventions only to one, randomly selected fraction of the intervention units (here, squads) and analyze how much KPIs differ between treatment and control groups. Only if the evaluation yields satisfactory results, interventions should be extended to the whole organization.

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How Behavioral Economics Applies to Marketing[1]

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What Is Behavioral Economics?

There appears to be no unanimity regarding the definition of behavioral economics (BE). Richard Thaler, Nobel laureate in economics, calls it "economics done with strong injections of good psychology." Shahram Heshmat writing in *Psychology Today* (2017) suggests that "Behavioral economics attempts to integrate psychologists' understanding of human behavior into economic analysis." And finally, Daniel Kahneman, writing in *Thinking, Fast and Slow* (2011), says "it seems that traditional economics and behavioral economics are describing two different species." Some authors (Walsh & Keller-Birer, 2019) appear to make the effective use of BE just a prescriptive process. Others suggest it has a significant role to play in human resource recruitment (Schanz, 2019). So how can Behavioral Economics be all these things, i.e., just an injection of psychology; part of an economic analysis; descriptions of different species; helpful to HR? At least one author suggests that the success of BE is in part due to marketing (Gal, 2018), whereas others worry about its use being legislated because of its effectiveness (Savage, 2019). So, let's try to shed some light on this often-confusing area of inquiry.

First, many authors describe BE as "deviations from rational-choice decision making." Amos Tversky and Daniel Kahneman, in one of my favorite textbooks, *Mathematical Psychology* (1974), used the concept of "bias" as the implied "cause" of these deviations. Some of them had to do with the time value of preferred choice outcomes, others with risk-reward trade-offs and their effect on choice outcome preference. Richard Thaler beautifully organized what Tversky and Kahneman had learned, demonstrating how such effects could be used to improve the predictability of more classical economic theory and BE was born. The then-current operational definition of BE: "the scientific understanding why the highest financial return choice alternative is *not* always the preferred one." Many such effects have been identified (we even constructed a glossary) but we are not friends of the "bias" explanation of them. Let me explain.

One of our first studies required that we model the components of retail food store shopping behavior. We discovered that food store preference of the majority of shoppers was driven by Price, slightly fewer by a combination of Price and Quality, others by Only Quality and still others by satisfying a product List they constructed each week. So, applying the rule of "rational choice decision-making" to these results simply required us to substitute the set of preferred chain stores for those shopping for Price, for Price and Quality and for Only Quality. But what about the List? Surely this was "List Bias," (another entry in our glossary of sources of deviation from rationality) because how could anything be maximized with a list? Closer inspection of the family composition of those with List Bias revealed that they were buying specialized brands and flavors for the children aged 6–12. What was being maximized was neither Price, nor Quality, nor Price and Quality, but the delight of their children at receiving their preferred products.

The utility derived from the use of the List was psychological, not financial or product related. With this insight, we all understood the concept of "Endowment Bias," an entry already in our glossary.[2] From that moment onward, we refrained from explaining any finding as a bias but rather a "non-standard" assessment of expected utility. This forced us to review in detail the methodologies of the decision-maker to define the expected utility of a choice alternative. Our

[2] Interestingly, a similar conclusion was reached by Gary Klein about Confirmation Bias (2019).

rationale for this change of direction was simple – the tool measuring the expected utility was in the "head" of the decision-maker, not in the head of the experimenter. What was needed was a tool that extracted the value template from the decision-maker.

Through a series of experiments, we began to understand that there were a fixed number of "Elements" (e.g., Price, Quality, Price and Quality, List) used to make purchase decisions in each product/service category, that these Elements operated in a system with other Elements, and that these systems resembled a neural network with recursion.[3] In fact, all that was needed to interest a buyer in switching from their "old" to a "new" food store was to present the new store as performing well on both the Primary and Secondary decision Elements.[4] Was this an example of "fast thinking," as described by Daniel Kahneman?

So far, we had —

1. Defined "bias" as being based on the size of difference between the experimenter's expectation of decision gain or loss compared to that of the decision-maker. In other words, if a decision option resulted in a clear diminution of gain compared to another, the experimenter's explanation was often the experimenter's not that of the decision-maker. This explanation by pejorative naming contributes little to the basis of the decision and is, in itself, patronizing. For example, we would suggest that smoking behavior (or any dissocial or criminal behavior) is not "illogical" or due to the "bias" of the smoker but has a true utility to the smoker. As such, it would be most quickly extinguished by communicating the negative utility (consequences) of continued smoking, thereby minimizing the overall utility of smoking. Please note that we have no quarrel with the concepts of risk avoidance or the perceived time-value of money, but only in the attribution of the source of the effect. Also, please note that choice-option effects on preference such as that caused by frame differences in value or time are explainable as differential referents to decision Elements. These cases are valid examples more similar to early sensory psychometric experiments than individual "biases," however.

2. Identified the components of the Utility template, e.g., Price, Quality, List, etc., so that the sources of positive or negative utility are known, and thereby, become more manageable (*recognition* in the Helmholtz machine context).

3. Modeled the relative saliency of the individual components of the Utility template, e.g., Price, Quality, List, etc., as a system so that the order of greatest positive or negative utility are known, satisfying our search for a common process useful across multiple choice environments (Gohmann, 2015; Gohmann, Mundy, & Goy, 2016).

4. Generated our own definition of BE, the study of "How the expected gain or loss of utility anticipated as the result of a decision is constructed by the decision-maker."

[3] This conceptual model resembles that of a "Helmholtz machine." There is a *recognition* component (what the Elements represent) and a valuation or *generative* dimension. For example, only the Primary Element or the Primary and Secondary Elements were needed to predict preference, reflecting the *generative* component of the Helmholtz machine.

[4] See Gohmann, Mundy and Goy (2016) for an explanation of the experiment.

What Is Utility?

Unfortunately, even with a definition of BE which used the concept of Utility, we had not yet been able to operationalize it. Introductory economics textbooks attribute the concept of Utility to Adam Smith, John Stuart Mill and/or Jeremy Bentham. Some sources even suggest that Utility is just the best experience of happiness that humans can have in the "Earthly City" as described in The City of God (Augustine of Hippo, 1470). Regardless of which of these early definitions was used, Utility was a "state" or experience, not a function specifying its differential levels. However, the more recent questions regarding its "make-up," how it differed from base- or steady-state levels and under what circumstances it changed had to be included in an effort to operationalize it (Kimball & Willis, 2016).

We began by debriefing respondents in our qualitative sessions on the decision system templates resulting from the models whose input data they had provided. We found that what we call Utility was a phenomenological entity the expected level of which was constructed incrementally by buyers as they moved through their decision system and "passed" or "failed" each choice alternative on each decision Element. Elements with greater saliency in the model contributed more Utility than less salient Elements.[5] So far, our qualitative, albeit anecdotal, evidence confirmed that of Kimball and Willis, 2016, that is, Utility was a "state," and was more easily assessed as the expression of an expectation that could motivate behavior change. Interestingly, our qualitative session respondents were never able to identify or name this phenomenological entity (Utility) but often referred to more attractive decision options as "that's better" and copied their decision template so that "...they would not make the same 'mistake' again."

We began to construct expected utility models and tested them against purchase decisions made by the respondent. Fourteen months later, BrandEmbrace® was released to our clients at the end of 2016, and is described in detail elsewhere (Gohmann, Goy, & Mundy, 2017). It is a modeled value generated for each choice alternative for each decision-maker and takes the following form for *each* respondent:

BrandEmbrace® Expected Utility = $\sum_1^N(\boldsymbol{Wi})(\boldsymbol{Ki})$ where: N= Number of Decision Elements, W = Relative modeled saliency of each Element, K = Alternative K choice option score on each Element. The summed value is scaled to vary over a range of -100 to +100.

The likelihood of switching preference between two choice alternatives for a single respondent is $[\sum_1^N(\boldsymbol{Wi})(\boldsymbol{Ki})] - [\sum_1^N(\boldsymbol{Wi})(\boldsymbol{Li})]$ and has been found to be relatively invariant across product and service categories. Scores representing switching likelihoods for all brands in a category are often displayed as pair-wise brand co-occurrence entries of the same form but summed over respondent buyers. Measurement validity, calibration and reliability are described elsewhere (Gohmann, 2018).

Based on the qualitative debriefing of individual respondents, the BrandEmbrace® Expected Utility number line is shown in Figure 1 below:

[5] We were later to learn and demonstrate to clients that the likelihood of switching away from a buyer's regular product or service to a new one could usually be accomplished with enhancements to only the first two or three Elements in the decision system, replicating the finding of Gohmann, Mundy and Goy (2016) across multiple categories.

Figure 1: BrandEmbrace® expected utility number line

BrandEmbrace® signals the positive or negative level of an expected end state. Because preference is the result of the difference in BrandEmbrace® between two choice alternatives, the more interesting use of this number line is in the comparison of two hypothetical choice alternatives (Figure 2 shown below). As can be seen, the differences in BrandEmbrace® scores between two choice options are now plotted together with the interpretation of the resulting preference decision. Again, the choice preference conclusions are based on the qualitative debriefing of individual respondents. From this qualitative overlay on the validated prediction of brand preference and switching, our next area of inquiry was investigating how a respondent "moved" around on this "playing field." In other words, what was the mechanism of change? We knew that BrandEmbrace® itself pointed to a positive or negative experience based on which Decision Elements each choice option "passed" or "failed." Was there a common basis for passing or failing? Again, asking respondents in a qualitative environment and then confirming in large-scale quantitative studies gave us the answer – certain phrases or word structures represented the reasons for passing or failing, and there were a finite number for each decision Element. These statements appeared to act as heuristics, i.e., "rules-of-thumb" for passing or failing.

			CHOICE ALTERNATIVE B BrandEmbrace®				
IDENTIFY WITH B & VILLIFY A (+162 to 200)			AFFECTION 81 to 100			IDENTIFY WITH A & B (+162 to 200)	
	EMULATE B & REJECT A (+122 to 161)		AFFINITY 61 to 80		EMULATE A & B (+122 to 161)		
		ATTRACTED TO B & RECOIL FROM A (+42 to 121)	INTEREST 21 to 60	ATTRACTED TO A & B (+42 to 121)			
HATRED -100 to -81	DISGUST -80 to -61	DISLIKE -60 to -21	AMBIVALENCY -20 to 20	INTEREST 21 to 60	AFFINITY 61 to 80	AFFECTION 81 to 100	CHOICE ALTERNATIVE A BrandEmbrace®
		RECOIL FROM A & B (-42 to -121)	DISLIKE -60 to -21	*ATTRACTED TO A & RECOIL FROM B (+42 to 121)*			
	REJECT A & B (-122 to -161)		DISGUST -80 to -61		*EMULATE A & REJECT B (+122 to 161)*		
VILLIFY A & B (-162 to -200)			HATRED -100 to -81			*IDENTIFY WITH A & VILLIFY B (+162 to 200)*	

Figure 2: BrandEmbrace® expected utility paired choice comparison

Could these statements be used as the basis of interventions to change preference? Were these "rules-of-thumb" just "nudges?"

What Is a "Nudge?"

This led us to investigate the concept of the "nudge." Popularized by Daniel Kahneman, it was suggested that a nudge could act as a "trigger" function to "release" preference. Referenced by behavioraleconomics.com, Thaler and Sunstein (2008, p. 6) describe a nudge as "*any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting the fruit at eye level counts as a nudge. Banning junk food does not.*"

Could the "pass/fail" heuristic we had discovered be a "nudge" if presented to the decision-maker? It satisfied all of the Thaler and Sunstein requirements except for the use of a "default" option. Could everything except a default contain some level of Utility for the decision-maker? Could the expected effectiveness of the nudge be determined in advance of exposure to it? Was there an optimal set of nudges, and were some more effective that others? We are now in the process of testing these hypotheses by decomposing BrandEmbrace® into a set of "pass/fail" heuristics, and evaluating their effectiveness as "nudges."

Behavioral Economic Perspective to Key Marketing Questions

Because of how we have operationalized and applied BE, as described above, we are often asked to provide a BE perspective on some key marketing questions. Below are our responses to some of these following an earlier elaboration (Gohmann, 2019).

Era 1 — Category Utility: Were Supply-Side Economics the Only Cause of the Explosion of Consumer Product Demand in the 50s and 60s?

Our BE interpretation is that a perfect "marketing storm" was caused by three factors: product availability (supply side), the emergence of mass media, and relatively low utility of undifferentiated brands. Our hypothesis is that with fewer decision Elements in the 50s and 60s with which to define utility, the basis of brand preference (and share) was more constrained and it was "easier" to stimulate demand just by introducing a new flavor of toothpaste, for example. This "frame effect" together with high-reach messaging from the new high-utility entertainment device in the household (TV), produced the rapid gain in branded-product demand. Perhaps the easiest example is that of the transition from tooth dentifrice (powder) packaged in a metal can to multi-colored/flavored/benefit tooth paste in a tube. In comparison to dentifrice, brushing with toothpaste was fun. But as the number of added utility drivers in the toothpaste category plateaued, so did its volume, and the battle for brand share begin.

Era 2 — Brand Utility: Why Was Marketing in the 70s Through the 90s Focused on Gaining Share?

With the relative plateauing of category volume in Era 1, there was literally "no other place to go" in order to build brand volume other than stealing share or creating new categories, e.g., digital cameras, quartz watches, Sony Walkman®. These new categories provided new sources of utility stimulating both demand and volume. However, the bulk of the marketing activity

was still focused on brand building through the concept of "new," i.e., flavors, line extensions, colors, packages, sizes, etc. – anything to gain a utility advantage over the competition. With each new brand line-up enhancement came incremental utility and preference probability to the buyer segment sensitive to it, just as we have shown in our work. The John Wanamaker adage, "Half the money I spend on advertising is wasted; the trouble is I don't know which half." explains the proliferation of product variations introduced to gain share. The growth of the large ad agencies (McCann, Ogilvy, Y&R, etc.) to support this proliferation and the research firms to measure the share contribution of each product (Nielsen, IRI) are testament to this "brand utility" era. However, soon the complexity of the messaging (Does every feature actually carry utility?) and the negative utility of the retail environment (Did the buyer find what they wanted?) obfuscated the utility basis on which clear purchase choices could be made. As the consumer utility of the proliferated brand was declining, the same thing was happening for the marketer. They were assuming additional expense to "match" the right buyer segment to the right product, while paying the retailer more to keep their brand proliferations on the shelf. Something had to "give," but what?

Era 3 — Choice Utility: Why Is Marketing in the 2000s Focused on Choice Options?

Those proliferated branded product offerings had utility – the research that supported their introduction was not erroneous – it was the negative utility of understanding the basis of value, and the effort of locating them at the retailer and "schlepping" them home that made it a nearly "zero-sum utility game" for the buyer. Enter those who stop making product marketing a zero-sum game even with highly specialized proliferated branded offerings – Amazon! And how do they handle the potentially confusing multiple-feature utility-driver comparison? Why, they allow the buyer to make not just one choice but present a series of choice options in a frame which allows a clear and easy comparison (and even more choices!). In fact, the ability to choose, i.e., to allow all of the available utility drivers to play a role in the purchase selection, defines this new era.

Marketers whose products or services do not allow for this type of presentation have learned how to take full utility advantage of their features. Rather than repeating the old "saw" of auto "reliability," GM demonstrates how superior reliability translates into real-life situations reducing personal risk and potential harm. Again, this allows the buyer to understand the potential utility-add of this feature. We believe that as we move into the second quarter of the 21st century, the concept of choice itself conveys additional utility to the provider of choice, but not necessarily to those providing the choice options. This is an important distinction for the marketer. So, what lies beyond the Choice Utility Era? How long will it last? How do we know if it is waning?

Era 4 — Personalized (Bespoke) Utility: How Will Utility to the Buyer Be Maximized in the Future?

When we provide such a futurist perspective, we are understandably concerned about its basis in fact, i.e., that there exists sufficient evidence for such an extrapolation. We believe that such evidence exists. For example, specialized grocery shopping services ensure that the utility afforded by the selected items is always greater than the effort (work) needed to procure the individual items on one's own. This follows the same BE rules as specialized consumer meal plans engineered to minimize exposure to an individualized set of allergens. These two examples are neither big businesses nor do they have deep consumer penetration, but neither

did Uber or Lyft in the recent past. We are only years (or months) away from an AI-driven concierge avatar eager to book unique travel experiences tailored to your specific interests. Soon major upscale hotel chains will offer amenities personalized to your specific needs and wants. These services maximize their delivered utility because they are based on a set of preferred options selected from a nearly infinite set of potential choices.

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Framing Good Behavior

Financial Firms Respond to the New Nudges

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Still "Too Big to Care"?

It's more than ten years since the financial crisis and apparently, perhaps, the banking industry has changed. Under the banner of "never again", regulators across the globe have introduced rules designed to prevent Too Big To Fail business models (Stern and Feldman, 2004) and *Wolf of Wall Street* practices (Belfort, 2007). Out went "light touch" regulation (Adamson, 2014) and in came a focus on financial stability and the personal responsibility of senior management (FCA, 2015).

Firms responded by investing heavily in risk and compliance programmes and re-focusing their business models. Despite being in the first wave of "behavior-regulated" firms (FCA-SMCR: bankers, 2017), banks are still making the wrong kind of headlines: ones involving mis-selling, money laundering, fraud, massive accounting irregularities and pay scandals. Human Risk, it seems, is still very much in full effect in the financial service sector.

For long-established firms, things are not going to get any easier. Digital challengers, disruptors and "shadow banks"[1] are re-defining what banking means. Given their role in many of the world's leading national economies, financial services firms also arguably owe their host (and home) nations a better response to wider societal challenges, by engaging more constructively with geo-political deficits in equality, sustainability, and transparency. Indeed, most banks have remained silent on a major emergent fault line in national governance itself: the risk arising from a perceived "democratic deficit" and public distrust of institutions, which together propel the rise of populism – or as we should now call it, Vox Populi Risk, as modelled by our BE colleagues at the World Economic Forum (Fordham, 2015).

New Lenses, Please

To better navigate this rapidly deforming terrain of social risk perceptions, regulators and firms need to limber up their cognitive muscles: to be, as a Conduct regulator just said (Davidson, 2019), more *reflexive*, more responsive to external change and the need adopt new approaches. On the corporate side, business models that "break things and move fast", Facebook-style, will need careful supervision to encourage the right (pro-social) and deter the wrong (rent-seeking) kind of innovation.

Technology is beginning to offer some solutions, and promises to bring more – though this risks provoking further social backlash (Tenner, 1997). At the individual employee level, behavioral analysis is beginning to home in on "tells" for misconduct, as AIs help us to identify clearer patterns of connection between dysfunctional behavior in different areas of social activity. (These are beginning to tell us when, say, an individual's off-campus private life signals sociopathic tendencies that would jeopardise the trust we'd expect to vest in the holder of a certain professional role.) At the markets level, algorithms that can spot suspicious transactions are beginning to gain traction against Financial Crime and Market Abuse. For customers – surely we can all relate to this – apps that give us more control over our money, may also improve financial literacy and help us to pay down debt. So far, so utopian.

[1] Firms undertaking banking-type activities outside the regulatory perimeter.

And yet, and yet… Those machines will be programmed by, and learn from, humans. Unless there is sufficiently intelligent supervision – on which point, let's face it, recent market history offers scant comfort[2] – the machines may simply automate and scale-up biases. To compound the risk, meanwhile: Freed by automation yet probably, thanks to (say) past centralizing of credit decisions, lacking much recent experience of direct human-based decision making, the coming generation of financial services managers will be free to spend more time taking decisions requiring nuance and judgement.

Far from reducing human risk, then, financial sector machine-learning looks likely to concentrate the risk into tighter, more fallible points of dependency. If you think this pessimistic or cynical, consider, as Conduct regulators remind us: It was catastrophically poor decision-making by some within the sector that has brought us to where we are today (Davidson, 2018).

I'm Intuitive, You're System 1-Leaning, S/he's Biased …

As regulators and practitioners know now thanks to BE – though if we are honest with ourselves, we've known it instinctively for centuries – organizational decisions all too often float on a raft of biases. Since the onset of SMCR[3], regulators now expect front-line practitioners to know about biases and to name them[4]. As the FCA rolls out the new Culture Audits among regulated firms, we're all starting some overdue "Conduct conversations": about Dunning-Kruger, motivated reasoning, risky shift, and the rest of the rattlebag of biases. As previously ignored, unchallenged, bias-heavy dialogues begin to face real scrutiny from Conduct regulators, firms are waking up to the risk. These are, after all, the faulty structures and assumptions that brought us to where we are today. Behavioral scientists in academia are happy to help us practitioners to top up our knowledge, even if some of the related debates between academic camps[5] appear to rage on, ignoring any practical application to improving commerce, risk governance or consumer protection in our field.

Not that all of us involved in finance have any moral right to shift the blame. One not-so-good reason why the financial sector has struggled properly to reform its recidivist tendencies is that the regulatory response has been to pile on more regulation: action bias in full effect. After a brief interlude in which we bracingly enjoyed engaging with a fresh new methodology (principles-based oversight of behavior), regulatory "business as usual" is reasserting itself. Faute de mieux, regulators have resumed unleashing ever more sets of rules (Miles, 2019) that often, looking to their political sponsors, value auditability over effectiveness.

Predictably Misbehaved

Ironically, as BE-ists it's a challenge to us that a major spur to "misconduct" is the rollout of controls, especially where the would-be controlled group perceives these as authoritarian,

[2] We're thinking of algorithm-triggered "flash crashes", "fat finger moments" and the whole "crypto" rollercoaster, among other recent market lowlights.

[3] The FCA (UK Financial Conduct regulator)'s major current instrument for behavior change: the Senior Managers and Certification Regime. This compels identified senior roles to attest in person to their own fitness, competence, and personal responsibility for the consequences of their actions. Bankers have had to comply since 2016; others (such as insurers, asset managers and brokers) come into compliance in 2018-19.

[4] Triggering what we informally refer to as 'Rabbit In the Headlights Risk', or 'No-Answer Risk'.

[5] Such as the over-hyped, and possibly confected, 'Kahneman v Gigerenzer debate'.

overlong, weakly designed, poorly explained, micro-managing, irrelevant, or just plain laughable. And, dear readers, let's be careful to check our own generational privilege on this point, as these risk perception factors are very far from being new knowledge. All right, ancient civilisations may not have retained any qualified social scientists, but their sharpest social commentators saw clearly how civic governance was undermined by these same factors – though perhaps we'd now label them as drivers of a crisis of legitimacy:

Corruptissima re publica, plurimae leges (Tacitus, 117CE)

("The more rotten the government, the more numerous the laws")

A mere 1902 years later, human understanding hasn't exactly leapt forward.

Every BE-scientist should also by now know that the implacable enemy of rule-making is unintended consequences (Merton, 1936), often following overconfident prediction of outcomes. Although of course we know this in theory, that knowledge seems still not to be helping the human race – much as we need it to, and much though there's an enormous and heterodox research base calling attention to this already (Bevan and Hood, 2006; Reinhart and Rogoff, 2011; King and Crewe, 2013; Phillips, 2019). As social historians and BE-ists will tell anyone who'll listen: would-be rule-makers need to learn that many perverse consequences, far from being unforeseeable and unintended, are perfectly predictable; so, everybody, invest more BE learning time to find out how to better predict these effects.

Cinderella to the Rescue

At which point, it's long overdue that we pay our respects to the Dutch school of BE, surely the Cinderella at this regulatory party, whose methodological beauty and elegance bankers are only just beginning to notice. It is not at all a coincidence that perhaps the world's most influential current thought-leader in Behavioral Supervision is also the biggest driving force behind a human-risk approach to supervising banks' capital bases: the Dutch Central Bank, DNB (DNB, 2016). The DNB itself has drawn confidently on a research-modeled knowledge of regulatory legitimacy and social consequences that dates back to the 1990s (Justitie, 2004). We'd like to imagine Dan Ariely smiling in recognition of how the DNB uses this supervision model (and the T11 protoype that inspired it), as it is "relentlessly empirical" (Ariely, 2008). Long before financial Conduct rules became fashionable, the Dutch Justice Ministry had put this empirical behavioral model to work, questioning the reality gap between regulatory intentions and rolled-out public consequences, or as these authors prefer to call it, the What-Actually-Happens Effect.

A related and enduring question that should concern us as social psychologists is to scrutinize relentlessly and empirically – thanks again, Dan – how leaders of tribes, governments, banks, or whatever, sustain a legitimate claim to authority, and hence public respect, and hence legitimacy. Some behavioral studies of leadership question whether 'legitimacy' is in fact the master-key we'd like to believe it to be (Cohen, 2001). Any modern public leaders' claims to legitimate governance are endlessly and iteratively tested by social proof in social media, against a background of citizen scepticism, where each individual is already an atomized "island of risk-taking" (Beck, 1992), more than ever as BE-ists we know that well-meant interventions are not enough. Those rules which to their political sponsors looked so benign on paper, so well-intended – when they're tested in practice it's found that the expected behavior-modifica-

tion in the regulated group fails to materialize; worse, they may not even register any noticeable uptick in public support for their agenda. Faced with the non-event of behavior change, many a sponsor or regulator at this point resorts to deceptive metrics to conceal it – Muller's splendidly furious expose of this has been one of the past year's best reads (Muller, 2018).

It is precisely this shortfall, between regulators' grand plans and What Actually Happens in markets, that the DNB's new (actually 2016) Behavioral Supervision model zooms in on. As the Dutch have known since at least 1993, rules plus threats doesn't equal behavior-modification. Change has to come from within; the regulatees have to *want* to change, meaning we must find and feed their intrinsic motivation (Pink, 2010). Whilst the external pressure for attitude change is undiminished, and indeed growing[6], it is by no means clear that the financial sector has internalized the message. As our formal qualitative investigations are finding, the propensity to take up Conduct mandates (willingly or otherwise) varies very widely between and within firms, markets, and jurisdictions (Delaforce and Miles, 2018).

Outlook: Further Turbulence

The practical experience remains varied, though overall average standards of engagement with the Conduct project are certainly rising, helped along by a spate of record-shattering fines against firms in the early stages (see FCA's annual *Review of Fines*). Where some financial market actors are receptive to Conduct initiatives, as the SMCR mandate extends in 2019 other firms remain apathetic, resistant, denying, or even, as one recent respondent told us, "genetically incapable of understanding" the Conduct imperative (author's private research, 2019).

Anecdotally – and the world's great financial centres have always been a goldmine for anecdotal evidence – it's apparent that entire subsectors remain Missing In Action; regulators make the call for culture change, but nobody answers. The Conduct regulator's proposal for, then retreat from, a Culture Thematic Review (during 2015-16) suggests a certain political coyness about raising thorny questions. Sometimes, as in Australia at time of writing, a perceived lack of traction may lead regulators to wrangle over jurisdiction (*Sydney Morning Herald*, May 20th 2019); elsewhere, the specific event of a trust-shattering externality can be so huge that the resulting public reification of the risk forces the whole sector to come together to put its collective house in order (Baltic and Nordic group story, *Central Banking*, May 13th 2019).

"Trust Us, Now, We're BE-Literate!"

Is Trust in providers changing as a big-win outcome of all this behavior-based intervention? We're not certain. Egged on at the time by distinguished academic colleagues, some years ago we suggested in print that the major disorder among the industry's leading actors was not so much a systemic problem (being "too big to fail") as a group-effect cognitive disorder: that they're "too big to care" (Miles, 2015).

This year, we're involved in behavioral primary research which suggests that, far from that being a flippant diagnosis of the problem, we may have been close to the truth back then – if perhaps the recently emergent picture is a little more nuanced than we'd suggested in 2012 (Delaforce, 2018). This brings us to the main point: Everyone in the Conduct regulated space is

[6] That Vox Populi risk, again.

desperate for new methods of diagnosing the problems and, with varying degrees of authentic or cynical intent, assembling a corporate scorecard to report to the regulator What Good Behavior Looks Like.

So to a brief fly-by of some Observed Good Behavior elements we are researching to put on the scorecard. It is worth noting in passing that several regulatory and quasi-governmental groups have been addressing this challenge but they remain curiously coy about sharing their findings. Of the two possible explanations for this, we'll leave you to choose which you find more compelling:

The agencies' research assumptions are unsound; in particular, the assumption that outputs from staff sentiment surveys aggregate into a single reliable proxy for Corporate Culture; or:[7]

British regulators have a long-established penchant for leaving it to practitioners to design their own reports, particularly where new methods are involved. They present this as inviting industry participation. In fairness, properly executed Culture scoring presents a terrific opportunity for firms to shape their dialogue with the regulator.

Defining the New Virtues

In the UK, as Phase 2 of the grand SMCR "behavioral enforcement" project rolls out during 2019[8], regulators are urging business leaders to engage more publicly with a set of newly defined behavioral virtues including: reflexivity, intellectual humility, authentic sense of purpose, welcoming of challenge (Davidson, 2019). But buying into exhortations to raise the "tone at the top" risks fooling ourselves, if we expect these to translate automatically into improved behavior on the front line.

Echoing Kahneman, as two leading exponents of "behavioral regs" see it, even more starkly: The kind of people who make rules, shouldn't be left to make the rules (Roberto and Kawachi, 2016) (we paraphrase, but only slightly). To the regulator's list of "virtues", as seekers of salient behavioral indicators, we'd have to add a couple more suggestions: propensity not to be a bystander; engagement with a cognitively diverse range of people; and collegiate working. These notional indicators need work – but rest assured, we're working on them.

Human Assets, Human Risk

In a fast-moving world, it's all too easy for an overly prescriptive rule-maker inadvertently to prepare adverse outcomes. No-one writing a policy on trading a few years ago would have foreseen the advent of crypto-currencies like Bitcoin, a development so huge that it even makes its own weather system (Lou, 2019). In an environment where behavior is governed solely by adherence to the rules, the risks of mindless compliance fuelled by learned helplessness and wilful blindness become all too apparent. Encouraging individuals to think of their actions by reference to a set of rules, risks reducing their sense of responsibility; the regulatory equivalent of the people who slavishly follow their GPS units and drive into rivers.

[7] This is a similar BE-methodological faux pas to using Net Promoter Scores for the same purpose – but doesn't seem to stop many firms from relying on it anyway.

[8] Phase 1 of SMCR in 2016-18 involved the banks ("deposit-takers"); Phase 2 (2018-19), all other financial firms.

The dynamics of modern employment also need to be considered. The presumption that the interests of employees are automatically aligned with the organisations they work for is undermined by the cost environment, by the risk of redundancy, and by the subversive tribal tendencies of some parts of the market (Mandis, 2015). Career mobility also means a "job for life" is probably a thing of the past. Whatever the deferred compensation regimes might desire. As a result, appealing to employees with the extrinsic motivation of doing things in the Firm's best interest, is likely to be far less effective in managing risk, than intrinsic motivators.

Meanwhile BE is now, thank goodness, mounting a sustained attack on the core fallacy of government and regulatory design, that regulatees will behave themselves better, if only they have "good behavior" explained to them with sufficient rational clarity, backed by a big stick. Credit here where it's due to the UK's Conduct regulator: their new programme focus on Cultural Leadership recognizes that good behavior follows not just from leader example – so-called "tone at the top" has been disproved as a sole source of change (Sheedy and Griffin, 2018) – but from helping all staff to find their own sense of purpose. It's a noble challenge, the response to which we look forward to observing and reporting.

Conclusion: More BE Input Needed

If as an industry, finance really wants to solve its twin problems of public trust and regulatory legitimacy, then we need to press ever harder for a behaviorally intelligent approach. This entails both regulators and practitioners working even more closely together to produce higher quality, empirical observation-based behavioral reporting; not staff sentiment surveys nor NPS scores, fatally skewed as these are by Hawthorne effects, optimism bias or endowment effect.

No: what we collectively need now is an industry-wide and locally informed dispassionate view of What Actually Happens Here. A few tech providers are answering this call with AIs for deep language analysis, social network analysis, Culture scoring, and enforcement hotspot mapping. For now, mostly, regulated firms remain focused on more functional short-term workplans to pre-empt the dreaded "no-answer risk"[9].

We can perhaps take inspiration from behaviorally intelligent approaches elsewhere, such as Netflix's infamous five-word expense policy: Act In Netflix's Best Interests. It is open to abuse, but at the same time requires the individual following it to consider the legitimacy of their expenditure based on substance, rather than relative to an arbitrarily determined limit. It is also very easily understood and with a little guidance, probably both effective and cost-effective.

Rules need to reflect the realities of the complex, nuanced world in which Firms and individuals are operating. Sometimes it is possible and necessary to hard-code limits and prescribe specific requirements; particularly when the consequences of non-compliance are severe. However, pretending the world can be controlled in binary black-and-white, when we know that in reality perceptions, motives and impulses are grey, does not help the end user to navigate the realities of the world they actually inhabit. A Firm- or Regulator-Centric approach that does not consider how easy a policy or regulation is to understand or implement on the ground, risks bad outcomes. Writing something down in an all-encompassing encyclopaedic rulebook might

[9] As in: what happens when a Conduct regulator's case officer tours the firm's front office and pauses at the desk of a junior staffer to ask what they understand by, for example: "social purpose", "behavioral regulation", or "competence" (and yes, this now happens).

still give an illusion of control but does not guarantee that any of the real people out there will take the edict on board – let alone change their behavior in response.

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Using Behavioral Science to Engage 1 Billion Men for Gender Equality

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Introduction

Inequality between men and women is a broad topic that ranges from child marriage, sex-slavery and sexist comments in the street, to a stereotyped vision of the roles men and women hold in the home, and inequity in pay and promotion in the workforce. In this context of such varied issues, two questions arise. Which topics do we tackle? And how do we engage men to change behavior and effect meaningful change?

One organization that thinks about these two questions every day is the United Nations Women's HeForShe movement. The HeForShe movement has a bold vision: *to engage 1 billion men for gender equality*. The movement invites men and people of all genders to stand in solidarity with women to create a brave, visible and united force for gender equality. The men who commit to HeForShe work with women and with each other to build businesses, raise families, create corporate and civil practices, and give back to their communities in ways big and small that contribute to supporting women.

From an activation standpoint, HeforShe does two things. First, the movement drives pre-engagement of men through gaining their commitment to achieving gender equality, by having them sign up to be part of the movement on the HeForShe.org website. Second, HeForShe shares stories and tools to inspire and engage men to take action within their own communities.

Recently, the BVA Nudge Unit was asked to support the HeForShe movement to amplify their efforts to achieve their goal using a behavioral science approach. In this article we will present:

- How commitment is a powerful tool to drive action (Part 1)
- How the BVA Nudge Unit helped HeForShe drive commitment of men in favor of gender equality using two proprietary tools created by the BVA Nudge Unit: the Drivers of Influence™ and the Stairs of Change™ (Part 2)
- Some other examples on how to use behavioral science to overcome barriers to achieving diversity and gender equality (Part 3)

Part I: Using Commitment as a First Step Towards Behavioral Change

Experienced marathoners who were asked about their goal in a pre-marathon survey ran 6 minutes faster than those who were not asked about their goal. This is just an example of how commitment (here expressed as a simple formulation of a target) can impact actual action, and sometimes, achievements.

The BVA Nudge Unit's role with the UN Women was to help the HeForShe team encourage men to commit (manifested by them signing up to be part of the movement), with the informed hope that their commitment would then lead them to engage in other ways.

Commitment can take many forms; it has been shown that simply ticking a box can lead to impressive results. This is the example from an experiment conducted in a California hotel, where the staff presented guests with information on the hotel's commitment to being eco-friendly. Guests could tick a box to commit to being eco-friendly during their stay, and this simple box

ticking led to an average increase in 25% of used towels being hung for re-use (Baca-Motes et al., 2013).

And actually, it appears that the more specific the object of the commitment, the more likely people are to actually implement the action they commit to do. As part of an immunization campaign to encourage people to get a flu vaccine, a large company offered its employees a vaccination. To increase the likelihood of them actually getting vaccinated, management sent three types of letters to three groups of employees: one was informing them of the date and time of the vaccination; another was asking employees to fill in by hand the date they would be vaccinated; and the third asked them to fill in by hand the date *and time* they would be vaccinated.

What was observed was that the second letter with the date led to an increase of 1.5% of employees vaccinated compared to the simple letter. The third letter, with the date and time, led to an increase of 4.2% of employees vaccinated (Milkman et al., 2011). This impact could simply be attributed to the increased ease to visualize a specific goal compared to a larger or more ambiguous one.

This experience also hints on the fact that people "actively" engaging in the commitment (here by writing their commitment themselves) are more likely to realize the related plan. This is potentially due to two factors:

- The first one is that actively engaging in the commitment increases the cognitive dissonance resulting from not doing the related action. Cognitive dissonance relates to the internal discomfort people feel when their beliefs, emotions, attitudes and actions enter into contradiction with one another (Festinger, 1957). One theory is that commitment is very effective in leading to the committed behavior because if not, cognitive dissonance would occur (Cialdini, 2007). So the stronger (or the more active) the commitment, the larger the discomfort created by the potential cognitive dissonance if the commitment is not honored.

- The second one is that "active engagement" is often linked to people actually being able to choose some elements, such as the degree of their commitment, or how they will realize their plan, and the degree of autonomy. An example of this comes from a study whereby a group of people were encouraged to save energy. A group of researchers equipped the target group with a device to track the energy consumption of their washing machine, and tested three approaches:

    - "Save energy": They just told the subjects to save energy. This led to 9% savings.

    - "Save 20% energy": They told the subjects to save 20% energy. This led to 18% savings.

    - "Choose your own energy savings target": They told them to set a numerical target of savings by themselves. Interestingly enough, people chose on average a target of 20%, like in the other group… But this time it led to 22% energy savings.

Another very effective way to maximize our chances to honor our commitments is signaling our commitment to others. The website stickk.com, helping people reach their goals, explicitly relies partly on committers naming referees, i.e. people that they know who will be informed of their progress towards their goal (e.g. exercise more, lose weight, etc.). This technique works

because we like to behave in a way that makes us meet the image we have of ourselves, and because we like to communicate this image to others.

Finally, we cannot talk about commitment and its often huge impact on people's lives without mentioning the "save more tomorrow" example, in which employees committing in advance to saving a proportion of their future salary raise saw their savings' rate more than triple, from 3.5 percent to 13.6 percent over the course of 40 months (Thaler & Benartzi, 2004).

Now that we have a stronger understanding of the power commitment on future behavior, next we will describe how the BVA Nudge Unit worked with HeForShe and used a variety of other drivers of action to encourage such impactful commitments, by men, in favor of gender equality.

Part II: Driving Commitment of Men in Favor of Gender Equality

In an effort to support the HeForShe objective around commitment, the BVA Nudge Unit conducted a project that led to the design of "nudges" to behavioralize that process. The way to think of a "nudge", behaviorally speaking, is that it is an element in the environment that guides the adoption of a desired behavior, without constraint, to help people achieve their goals (or turning intention into action). Specifically, a range of approaches were developed to drive awareness of the HeForShe movement and convince men to make the commitment on the HeForShe website.

Figure 1: BVA Nudge Unit's Stairs of Change™

First, we looked at the full behavioral journey that men would take through our Stairs of Change™ framework, which as the name alludes to, is a stepwise process that inspires the development of a behavioral science based strategy to drive behavior change. The best way to think about our Stairs of Change™ is to imagine you are climbing up four stories of a building, where each of the four stories represents an important stage to behavior change. As you

ascend to the top, you get closer to achieving your end goal. However, if any of the stories are skipped haphazardly, then you risk collapse.

Figure 2: BVA Nudge Unit's Drivers of Influence™

Secondly, if the Stairs of Change™ represents the more macro journey, then you can consider the "nudges" we developed as the individual steps on that journey. For those, the BVA Nudge Unit drew on our proprietary Drivers of Influence™, a tool that isolates heuristic-based levers to amplify the effectiveness of specific activations.

Now let's take a look at the approaches in more depth.

Step 1: Create Awareness and Attention

The first step of our Stairs of Change™ asks us to think about how we "Prepare the Field" for behavioral change. This is where we think about how to awaken the attention of our target – such as finding the right time, place and messenger.

Given the sheer size and diversity of the target, creating awareness and attention requires many different strategies. Selecting a "one-size-fits-all" approach may not be effective, as what creates attention in one context may not work for another context.

With this in mind, one specific targeted approach was to think about men in the workplace. This area was considered fertile ground, given the number of HeForShe Corporate Champions that have committed to the movement and already started taking action in the workplace aimed at their employees. The HeForShe Corporate Champions are companies that have committed to reaching diversity objectives.

These companies include BNP Paribas, Schneider Electric, Barclays, Unilever and many others.

Specifically, a tactic was developed to use the new employee on-boarding process as the time and place to transmit to new joiners the gender equality value within the organization – and potentially use this timing to talk about the HeForShe movement. Indeed, attention is very high during this period, as is the influence of social norms, due to the need to assimilate into the new environment. Leveraging the impact of the "Transmitter" driver, another tactic was to use the male CEOs as a vehicle for the message in the form of a welcome video.

An insight was uncovered in this stage through our primary research (conducted in USA, Chile, France and South Africa) that related to a specific barrier to men's attention. There was much uncertainty of what the HeForShe movement was about which led to a lack of engagement. The name of the movement, HeForShe, was not immediately intuitive and created associations with the LGBTQ movement. This was further exacerbated when men visited the original HeForShe.org website and the primary image was an abstract illustration that failed to clarify the mission of the movement.

As such, it became imperative that future activations clarify the message. Inspired by several of our Drivers of Influence™ that play on emotion, messenger and social norms, the updated website was optimized to include:

- Images of men appearing on the screen, and showing their own commitment by holding a "#heforshe" sign
- Simple messages on the screen highlighting the purpose of the movement by directly talking to the reader and inviting him to join: e.g. "be the change"; "your personal invitation", etc.

- A display of the number of people having already committed to the movement

Step 2: Convince

The second step in our framework guides us to think about how we can "Engage without Effort". As mentioned earlier, it is necessary to take the right first step by awakening the attention of the individual, but if you are not engaging in a relevant way, you can fail at this next equally important stage. Here is where we consider how we can speak to individuals' expectations and their motivational factors, and do so in an intuitive way.

From the primary research BVA Nudge Unit conducted among our target group, we found among a sub-set of men that when the gender equality message was framed and interpreted from a father's perspective, it connected to them on an emotional level and aligned with their expectations to serve as a provider or protector of their daughters. As such, we saw that some of the movement's videos that included the perspective of the father, connected strongly and intuitively with some men. This became a tangible manifestation of our "Emotion" driver at play.

Another insight at this stage was that it appeared unclear what the commitment was about. Giving money? Doing specific actions? Clarifying the requested action by highlighting the actual commitment before the sign-up "I am one of millions...who believe that everyone is born free and equal. I will take action against; Gender Bias, Discrimination and Violence to bring the benefits of equality to us all" provided the clarification needed to encourage people to commit.

Step 3: Facilitate Commitment

The third step in our framework has to do with "Facilitating the Choice." When the individual is faced with the choice of whether to act or not, we look at how we can redesign the environment and choice set in order to facilitate a "low-risk" first step and how we can then minimize constraints.

In conjunction with the primary research BVA Nudge Unit implemented, we also conducted an audit of the original website, learning that when people visited the site, there were several barriers that prevented them from "signing up" and making the commitment to the principles of gender equality.

For example, some website elements were more visible and unintentionally guided the visitor away from the commitment button. Based on this discovery, the web designers redesigned the website to make the "commit" button the most "Salient" (another one of our Drivers of Influence™). This also meant actually renaming the button, from the not entirely clear "Count Me In" to the more direct "I Commit".

Another barrier in this stage was the lack of clarity around the commitment process (length, information required) and purpose (what they were signing up for) and the lack of intuitiveness which created the perception of risk. Through the redesign, the "Easiness" driver was activated by clarifying the messages and reducing complexity. Very concretely this meant adding a subtitle below the commitment banner on the website, highlighting: "It's free to commit and only takes 10 seconds."

Step 4: Reinforce the Commitment

The last and final step of the Stairs of Change™ approach asks us to look at how we can "Encourage" the behavior and make it sustainable. For this, we think about things like providing reassurance through feedback, recognizing the behavior through rewards and activating social diffusion.

For this step, our "Social Norms" driver became an important lever to inspire nudges. Once we have someone who commits, it inspired several nudges with an eye towards enlisting them as an ambassador to the cause, to either inspire others to engage with the cause or to create additional commitments through their social networks.

Figure 3: The revamped HeForShe.org homepage

The Result

Coming out of our engagement and the deployment of some of the recommended activations, the HeForShe movement experienced an increase in commitment levels. Using the analytics from the HeForShe.org website, it was determined that commitments jumped from 2% to 25% among website visitors. https://www.heforshe.org/en

Part III: Other Examples from Behavioral Science to Foster Diversity and Gender Equality

While commitment and engagement are essential to fostering progressive cultural change, we would be remiss if we did not acknowledge the importance of other levers that can work together in a complementary fashion to drive behavioral change.

Specifically, as is the case with our topic of gender equality, oftentimes barriers to change are rooted in the unconscious in the form of prejudices, stereotypes, confirmational biases and other unconscious habits. Thus, becoming aware of them and making a commitment to change can only get you so far.

That is why we embrace the use of a multi-prong approach, one that pulls on more traditional levers of change, as well as one that dips deeper into Behavioral Science. Let's take a look at this approach through the lens of diversity and gender equality.

First, laws and regulation are a powerful lever in this space. More and more, we are hearing about new legislation aimed at eliminating the gender pay gap or creating greater representation of women at the leadership level of companies. One such example comes from Iceland: Iceland has become the first country in the world to legislate and enforce companies to prove they pay all employees the same. The new law, which came into force on New Year's Day 2018, means every firm with 25 or more employees must have a certificate showing they pay everyone in the same roles equally - no matter their gender, sexuality, or ethnicity.

Second is the use of information. In France, an index of equality has been implemented since January 2019. All companies with at least 50 salaried employees will progressively have to publish each year their global female-male equality grade, which is based on 4 to 5 indicators. The first objective of this index is information, the second one is to apply punitive measure against the companies that are in the lowest quartile and don't take action.

Third are corporate initiatives, such as Danone's approach to parental leave. Danone has been progressively launching a global parental leave policy, including 18 weeks of fully-paid leave for primary caregivers and pre-and post-natal support initiatives. The new policy aims to provide a consistent standard of support to all new and expectant parents across the organization's 100,000-strong global workforce, regardless of the country in which they are based, whether they are male or female, or whether they are birth or adoptive parents. The initiative was launched in early 2017, and each year, Danone implements it in new countries.

And lastly, are the use of nudges. Working in partnership with several of the HeForShe Champions, the BVA Nudge Unit has witnessed how companies can do a lot. Specifically, by analyzing key moments of truth from a behavioral perspective, you identify the individual, cognitive-based influences, social influences and the role of context on behaviors that have a direct or in-direct impact on diversity. Key moments can include the recruitment stage, on-boarding of new employees, and key moments during the day – such as in board meetings.

One example of the use of nudges in the workplace is a mid-size, Western US tech company's approach to using the annual review process as a vehicle to drive gender equality. During the annual reviews, managers' discussions on staff performance were previously often about employees personality rather than their actual work, and comments included various stereotypes: 14% of women were often criticized for being too aggressive, 8% of men were criticized for being "too soft."

The company initiated an employee scorecard which focused on the work output and its impact on the business and not the individual. The result? A year after rolling out the new scorecard, 0% of women were criticized for being too aggressive, and less than 1% of men were criticized for being "too soft". (Correll, 2017).

Another example of a nudge that can have impact in the active process of encouraging gender equality is that of a global company and their employee development practices: an international assignment is often seen as a crucial step in a successful career in large organizations. But not many women declare themselves open to international mobility (therefore creating a key distinction of men-women's preparedness for development).

Rephrasing the question on an employee development questionnaire from "are you internationally mobile" to "would you consider an international assignment sometime in the future?" led to an increase in 25% of the number of women declaring they were mobile, and thus candidates for further management development.

Conclusion

The world's biggest problems realistically are thorny, culturally complex and seemingly insurmountable. The biggest challenge is often the envisioning an almost inconceivable future and making the commitment to start the process of achieving it. The United Nations has been applauded for making such a commitment in the HeforShe movement, and for the remarkable evidence that already it is working at scale in such marvelous and varied ways. We are proud to continue to be part of the movement applying behavioral science to the ongoing initiatives designed to achieve its goal: *to engage 1 billion men for gender equality.*

Behavioral science has brought us many tools with which we can bring about small, incremental, cumulatively powerful influences that can effect meaningful changes. We have developed approaches that can be applied to other challenges, that can be replicated and adopted to similarly "nudge" and sustain desired behaviors that make countries, companies and individuals better.

Simon Sinek famously said, "It doesn't matter when we start. It doesn't matter where we start. All that matters is that we start." We would encourage anyone to consider the examples from the UN Women's HeforShe journey, consider the power of applied behavior science, and start your own initiatives to "nudge" the world to be a better place.

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Primed for Domination

The Threat of Amazon as a Challenger Brand

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Executive Summary

Amazon's sheer size and scale see it dominate some markets and poised to expand into new ones. But why does it succeed so consummately in some sectors, yet fail to make a significant impact on others? How powerful is Amazon's brand, and how much of a threat does it pose to new markets? To answer these questions, we employed behavioural and data science techniques and found some fascinating insights.

Current Markets

Our market landscape behavioural survey illustrates that the perception that Amazon offers the most competitive pricing, as well as the sheer ease and convenience of buying there, are vital to its success. And, while Amazon scores low on brand liking in sectors it currently operates in, likeability doesn't significantly impact consumers' purchasing decisions.

Poor price perceptions and a lack of trust help explain why Amazon is yet to succeed in groceries. Our findings show the UK groceries market as one where Amazon more closely resembles Goliath than David. It trails household names such as Tesco due to pronounced customer scepticism that Amazon offers good prices and expertise in this market. Our research finds that one of Amazon's UK partners, Morrisons, performs well in these areas – and so could be a formidable challenger if it considered acquisition.

Potential New Markets

In the second part of our research, we looked at the new sectors that Amazon might enter. The most striking finding from our RCTs is that Amazon could become a market leader if it entered the mobile network market offering Amazon Prime as a free perk. Its potential dominance would be equivalent to that held in toys and games currently, with 25% choosing Amazon over seven well-known network providers. Remarkably, Amazon would still beat Vodafone without a perk.

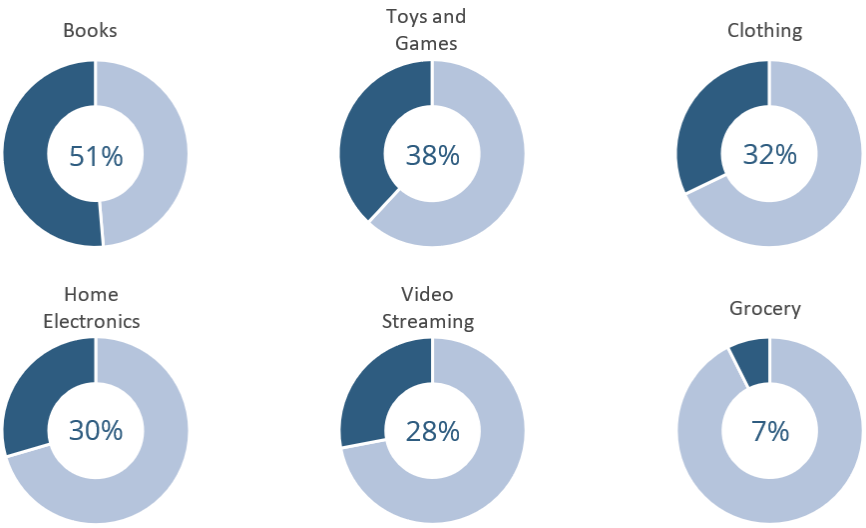

Figure 1: Proportion purchasing from Amazon in current markets

Our research finds Amazon is well placed to enter markets with a greater concern over price than brand loyalty, such as travel insurance. However, Amazon's brand has it limits, faring

less well in markets where purchases are typically more irregular and experiential, such as airlines and hotels. Consumers are also sceptical of Amazon entering markets where expertise is favoured, such as energy. Brand power and a reputation for offering the best prices can only take Amazon so far.

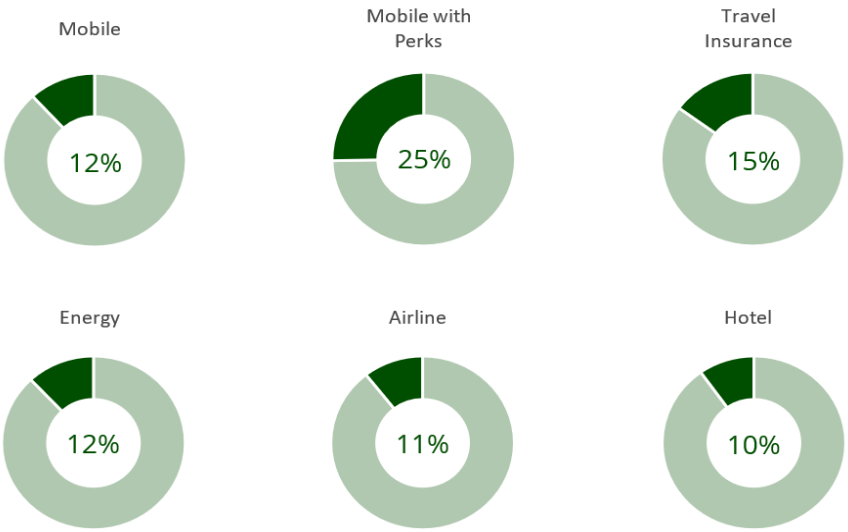

Figure 2: Amazon's forecasted market share in potential new markets

Recommendations

- ***If you can beat Amazon on price make sure customers know:*** Amazon is associated with offering the best prices, and not all consumers will check. Price comparison tools are convenient, customer-friendly ways to promote rival prices.
- ***Recognise convenience is key:*** Customers want the enhanced in-store experience but the ease of buying online. By integrating offline and online offers, customers get the best of both worlds.
- ***Curate your purchase experience:*** Delivering a unique, customer-centric purchase experience can improve sales; leverage your expertise as a point of differentiation.
- ***Differentiate your offering:*** Offer more unique products and services to avoid the race to the bottom and stand a better chance of persuading customers to pick you.
- ***Rethink your physical footprint:*** Consumers want to try before they buy. Use real estate innovatively - pop-up showrooms and experimental designs that prize convenience will engender greater footfall.

Introduction

Amazon is a behemoth. Since its foundation in 1994, Amazon's relentless focus on marginal costs and expansion has caused mass disruption across the retail world. Its impact most obvious in the home electronics, toys and games, and books markets, where household names like Toys R Us and BHS have been forced into extinction.

More recently, its strength in cloud computing and growing influence in online marketing and advertising sees it well placed to compete with the likes of Microsoft and Google. Even the lightest posturing by Amazon puts other industries on guard, and the company's purchase of Whole Foods in 2017 caused a collapse in rivals' share prices.

Undoubtedly, one reason for alarm is Amazon's ability to meet demand. Its fulfilment centres, which grew at a rate of 30% in 2016 and 2017 (Kim, 2018), are expediting customer deliveries with unrivalled efficiency.

To measure Amazon's domination potential, we conducted a behavioural survey and randomised control trial experiment. The survey ascertains the power of Amazon's brand and why it performs strongly in some markets but not in others. The experiment focuses on seven new markets, gauging the threat Amazon poses to incumbents and consumer expectations of its viability as a provider.

Amazon's Current Strengths

First, to gauge the power of Amazon's brand, we decided to look at its strength in markets it *already* competes in. We looked at six markets for this part of the experiment: four traditional industries (home electronics, toys and games, books, and clothing), and two where it is a more recent entrant (video streaming and groceries).

Using a behavioural survey, we asked a nationally representative sample if they were aware of a brand for a given sector; whether they would consider purchasing from them; and of those who said they would consider purchasing from a brand, whether they had made their most recent purchase with them. Finally, we checked how aware respondents rated Amazon and competitor firms across an array of brand perceptions.

Product Category	Price	Quick and Easy	Trust	Brand Liking	Range	Customer Service	Reliable	Expertise
Books	1st	4th	7th	6th	3rd	5th	2nd	8th
Toys and Games	1st	2nd	5th	6th	4th	7th	3rd	8th
Video Streaming	1st	4th	5th	2nd	3rd	6th	8th	7th
Clothing	1st	2nd	3rd	5th	7th	4th	6th	8th
Home Electronics	1st	5th	2nd	4th	7th	3rd	8th	6th
Grocery	1st	7th	2nd	4th	5th	6th	8th	3rd

Table 1: Rank importance of brand perceptions in driving purchase in each market

	Books	Toys and Games	Video Streaming	Clothing	Home Electronics	Grocery
Aware	91% *(66%)*	90% *(69%)*	79% *(58%)*	93% *(75%)*	89% *(80%)*	76% *(76%)*
Consider	79% *(37%)*	78% *(48%)*	70% *(50%)*	62% *(32%)*	67% *(47%)*	20% *(36%)*
Purchase	71% *(36%)*	54% *(30%)*	51% *(40%)*	56% *(35%)*	50% *(33%)*	48% *(51%)*
Price	57 *(48)*	56 *(51)*	51 *(52)*	51 *(49)*	57 *(51)*	49 *(50)*
Quickand Easy	55 *(48)*	56 *(51)*	51 *(51)*	60 *(52)*	54 *(50)*	55 *(50)*
Trust	51 *(57)*	47 *(51)*	53 *(52)*	45 *(45)*	47 *(51)*	47 *(48)*
Brand Liking	44 *(49)*	48 *(51)*	50 *(50)*	49 *(51)*	52 *(50)*	52 *(49)*
Range	57 *(51)*	55 *(50)*	48 *(48)*	54 *(49)*	56 *(52)*	50 *(50)*
Customer Service	48 *(51)*	51 *(51)*	48 *(43)*	54 *(51)*	48 *(49)*	53 *(52)*
Reliable	57 *(47)*	56 *(50)*	48 *(49)*	52 *(48)*	57 *(54)*	52 *(49)*
Expertise	41 *(52)*	38 *(48)*	55 *(57)*	34 *(50)*	35 *(44)*	41 *(54)*

Table 2: Amazon customer conversion rates and brand perceptions. *Note*: Numbers in brackets show the industry averages.

So, what did we find?

Amazon's Prices Are Crucial in the Sectors Where It Is Well Established

Price is the most important factor driving purchase decisions in every single market we tested for this part of the research. And it is little coincidence that across the four sectors where it leads the market, Amazon leads on price perception by a large margin. The importance of price proves to be the case even in the 'vanguard' sectors where Amazon is a more recent entrant and doesn't lead (video streaming and groceries). While there are other factors that Amazon underperforms on that are strong decision drivers in these sectors, it stands out that Amazon falls behind the market average on brand perception for offering the best prices in both (-1 compared with the market average) – and that these are the two sectors where it has its weakest conversion rates.

Brands Don't Really Need to Be Liked to Get Customers – so Negative Brand Associations Aren't Much of an Obstacle for Amazon

While Amazon is one of the most used retailers, it is hard to ignore the ongoing background hum of bad press it gets on labour practices, tax and privacy concerns. One of our hypotheses was that customers may be happy to buy from Amazon but might be a little squeamish about them as a company – offering more well-liked competitor brands a potential edge.

Unfortunately for those competitors, how much customers like a brand isn't a top purchase driver across most of the sectors we tested, on average being ranked as the 4th or 5th most important factor (out of 8). Indeed, Amazon is surprisingly well-liked in a couple, being perceived as at or above the market average in the three sectors where brand liking ranks in the top 4 decision drivers (video streaming (53 vs. 52), groceries (52 vs. 50) and home electronics (52 vs. 49). But the unimportance of being liked as a purchase driver is given away by Amazon not doing particularly well in these sectors anyway – and scoring far below the market average in sectors such as books, where Amazon is utterly dominant regardless of the resentment towards their impact on bookselling.

Quick and Easy Keep You Competitive

Beyond price, the second most important purchase driver across the sectors we analysed is efficient customer service. This is where Amazon pulverises the competition. Its capacity for next-day fulfilment all across the UK make it almost unbeatable in sectors involving delivery. Only Argos and Tesco are competitive with Amazon in this regard (in home electronics and groceries respectively, and toys and games for both).

Amazon's edge here is a key pillar of its dominance across the board in toys and games, and the main reason it leads the sector in clothing. While being able to compete on delivery with a firm that has 17 fulfilment centres across the UK might not be realistic for all competitors, Amazon's performance in clothing shows the importance of at least staying in a similar ball-park to Amazon's offer. It only performs moderately better than competitors on Price (51 vs. 49) and runs par on Trust (45 vs. 45), the other two key purchase drivers. But it leads the market thanks to being rated overwhelmingly better than the competitor average for being Quick and Easy (60 vs. 52).

Trust Is Informative to Where Amazon Breaks Through

Trust is the third most important purchase driver across the board and looks to be key to Amazon's weaker performance in two sectors: home electronics, where it leads the market but is in close competition with Argos, and groceries, one of its 'vanguard' sectors and where it performs very poorly. Home electronics is one where Amazon's lead is not as resounding as may be expected given how well it performs on price compared to competitors (57 vs. 51). In large part, this is because it does worse than the market average on trust (47 vs. 51). Consumers buying expensive home electronics want to know that they aren't going to get something shoddy for the price they often must pay. So, Amazon's poor performance here drags it down to a point where Argos is competing for market leadership.

While groceries aren't quite the same product, consumers want to know that the brand they buy from cares and knows about the product they're eating and that it's high quality. Amazon's reputation for selling anything and everything efficiently, regardless of what it is, doesn't always translate, and this is reflected in Amazon's poor score on expertise. Both issues combine to make groceries the weakest sector tested for Amazon in this part of the experiment.

The Challenge from Amazon

Having established a base of consumer perceptions regarding Amazon's strengths and weaknesses, we explored markets that it hasn't yet entered. Our tests sought to find out how much of a threat Amazon could pose to sector rivals, based purely on its brand power.

Participants were taken through a realistic simulation of purchasing a product via a price comparison website for three of the seven sectors explored: mobile, travel insurance, home electronics, energy, hotel, airline, and groceries. The propositions were always ordered from lowest price to highest price (as is typical of a price comparison website), but the order in which brands were presented to a participant varied so that each brand was randomly assigned to an offer.

Rank	Brand	Data Allowance	Minutes	Texts	Contract Length	Monthly Cost	Buy Now
1	giffgaff	1GB	250	Unlimited	1 month	£8	
2	EE	2GB	500	500	12 month	£8	
3	TESCO mobile	2GB	500	5000	12 month	£9	
4	Vodafone	1GB	500	500	1 month	£10	
5	BT	3GB	Unlimited	Unlimited	12 month	£10	
6	amazon	4GB	1000	5000	1 month	£11	
7	3	3GB	Unlimited	Unlimited	12 month	£11	
8	O2	4GB	Unlimited	Unlimited	1 month	£12	

Figure 3: Example screenshot from the RCT

Sector	Amazon Market Status	Amazon Forecast Market Rank	Amazon Forecast Market Share	Difference from a Top Competitor
Home Electronics	Established	1st	27%	+11%
Mobile	Opportunity	5th	12%	-7%
Mobile with Perks	Opportunity	1st	25%	+9%
Travel Insurance	Opportunity	1st	15%	+0%
Grocery	New Entrant	4th	13%	-4%
Energy	Opportunity	3rd	12%	-6%
Airlines	Opportunity	5th	11%	-15%
Hotels	Opportunity	7th	10%	-5%

Table 3: Summary of Amazon's performance across different markets. *Note*: Amazon was tested against seven leading brands in each market, so for any market Amazon's expected share is 12.5%.

The Entry of the Behemoth

The most striking finding is that Amazon has a great deal of potential power as a challenger competitor *across most sectors*. Out of a field of eight competitors in each sector, Amazon is chosen 16% of the time – higher than the 12.5% market share that would be expected were every brand equally strong.

To provide a benchmark illustration, Amazon is chosen by 27% of customers in the Home Electronics market. Its closest competitor in the sector, Argos, is chosen 14% of the time. In our research, Amazon's 27% in Home Electronics is rivalled as an example of market dominance by British Airways in the airline sector (which was chosen 25% of the time, with its closest rivals on

15% market share). As such, the average 16% share for Amazon across all the sectors tested is roughly equivalent to it entering each new market as a strong top three competitor. Across the sectors tested, there are only three where Amazon comes towards the bottom among consumers as a prospective challenger – hotels, airlines, and energy.

The Arrival of Goliath

The most notable finding is that Amazon could be a formidable challenger as a mobile network provider. If Amazon entered the market on just the power of its brand alone, it could outcompete two of the Big Four – Three and Vodafone (12% vs. 8% and 7%).

Brand	% Purchasing	
	Mobile Only	Mobile with Perks
O2	19%	17%
giffgaff	15%	11%
Tesco Mobile	15%	13%
EE	14%	9%
Amazon	**12%**	**25%**
BT Mobile	10%	5%
Three	8%	9%
Vodafone	7%	10%

Table 4: Results in the mobile network market and the mobile with perks market

However, when we modified the experiment to test the mobile network provider market and add prospective perks (offering Amazon with free Amazon Prime membership), Amazon becomes the overwhelming market leader: potentially capturing a quarter (25%) of the market, some way ahead of the current comfortable market leader, O2 (14%). This would be a level of dominance on par with Amazon in Home Electronics and British Airways among airlines. Some of this performance will reflect that some perks offer better value than others at the prices tested. But the enthusiasm for Amazon Prime as a perk bodes well for Amazon – as historically it hasn't been opposed to using initial loss-leader strategies to grab the market in other sectors.

Brand	% Purchasing
Amazon	**15%**
Admiral	15%
Aviva	13%
More Than	13%
Lloyds Bank	13%
AXA	11%
Virgin Money	11%
Zurich	8%

Table 5: Results in the travel insurance market

Furthermore, Amazon's reputation as a strong competitor on price makes it a good fit for some of the other markets we tested, such as travel insurance**.** Amazon could be a potential market leader, tying with Admiral for market share (15%). Markets where there isn't as much brand loyalty and customers are mostly looking for a simple product at the best price are much more promising for Amazon as a challenger, as its brand values align well with these products. Thus, Amazon does well in sectors which already have a strong online market and where online-only brands already operate.

A Trial for the Behemoth

One sector where Amazon would potentially have more difficulty is as a full entrant to the grocery sector (13%). Our research shows that Amazon would represent a substantial challenge to existing competitors – though, in keeping with the first part of our research, it has a great deal of work to do to become a market leader.

Groceries	% Purchasing
ASDA	17%
Morrisons	16%
Tesco	16%
Amazon	**13%**
Hello Fresh	13%
Sainsbury's	10%
Farmdrop	9%
Ocado	7%

Table 6: Results in the groceries market

Our research suggests that Amazon's reputation for offering the lowest prices attracts some customers in this sector (no small danger in one as price-driven as groceries, as the likes of Aldi and Lidl have demonstrated). This shows it could have an opening as a competitor on a pure

budget proposition. However, as seen in our behavioural survey results, its brand currently trails competitors on trust and expertise, which are important factors in this market.

The energy sector has one established market leader – British Gas (18%). All remaining competitors are clustered some way behind, with Amazon in the middle of the pack (12%). It can take some heart at least from the fact it outperforms established Big Six brands such as Npower and E.ON.

Energy	% Purchasing
British Gas	18%
EDF	13%
SSE	13%
Amazon	**12%**
E.ON	12%
Npower	11%
Scottish Power	11%
First Utility	10%

Table 7: Results in the energy market

The price of deals offered appears to be a particularly strong driver of brand choice in this sector, exclusive of customers' perceptions of whether the brand they buy from typically offers good prices. Nearly two-thirds of customers in the energy experiment choose the two cheapest options, regardless of anything else – notably higher than in other sectors. However, our research suggests that Amazon is damaged in this sector by a perceived lack of expertise. Amazon's brand as a logistical powerhouse has its limits.

Where Goliath Is David

Amazon does not do particularly well as a challenger in Airlines (11%) or Hotels (10%). In part, this might be because there is already a wide variety of brands within these two sectors that cater to the budget and higher end markets. It is less obvious what the gap in the market would be for Amazon.

Airlines	% Purchasing
British Airways	25%
easyJet	15%
Jet2	15%
TUI	14%
Amazon	**11%**
Ryanair	10%
Norwegian Air	8%
Primera Airlines	3%

Table 8: Results in the airlines market

Hotels	% Purchasing
Premier Inn	15%
Holiday Inn	14%
Hilton	14%
Travelodge	14%
Radisson Blu	13%
Ibis	12%
Amazon	**10%**
Z Hotels	8%

Table 9: Results in the hotels market

In addition, Amazon could face questions in these markets around expertise and quality as a challenger. Customers know what they're getting with existing brands that provide a budget offer. They may be less willing to take a gamble on an unproven new brand for less frequent and more 'experiential' purchases like flights or hotel stays, where the customer interaction is likely to have a more emotional effect. Just as Amazon does well in sectors where online brands can prevail, it seems to do worse in those that depend on the offline experience.

This is less of an issue in the sectors where Amazon tests well. The quality of the base product is more of a given for mobile network and travel insurance deals (how much data/coverage you have), and competition is more based on price and other factors. The same doesn't apply for a hotel room or a flight, where most customers would attest that quality can vary dramatically.

Recommendations

While our research focused on specific sectors, our findings offer a few general lessons for companies across sectors that could face the spectre of Amazon as a challenger.

If you can beat Amazon on price: make sure customers know.

If one thing stands out from both elements of our research, it's that price is usually key. While it may be hard to compete with Amazon if they enter your market at the most competitive price possible, there are plenty of examples of sectors where it doesn't (at least to begin with).

However, customers have strong brand associations with Amazon as a firm that offers products at the best possible price – and not all of them will do the research to verify that they are. Therefore, if your prices *are* competitive with Amazon, make sure customers know! Price-searching is a burden for customers.

Recognise convenience is key: make purchases seamless for customers.

If you're going to offer customers a showroom, make it as easy as Amazon would for them to buy what they see: ease and convenience is a common purchase driver in our research. For firms with existing bricks and mortar portfolios in sectors that rely on consumer trust and quality assurance, improve and integrate your online channels to make the purchasing and delivery experience as seamless and convenient as possible.

Curate your purchase experience: take a customer-centric approach.

This isn't always something that drives purchase decisions, but it's a hygiene factor that can shift purchases at the margins. While you might not be able to match Amazon's efficiency, using stores as more than just a point of sale can help you deliver a more unique, customer-curated in-store purchasing experience. The Apple Genius Bar and O2's Gurus make the most of the opportunity for face-to-face contact with consumers.

Differentiate your offering: give customers another reason to come.

Firms that offer something Amazon can't are typically in a better position. This could even involve out-Amazoning Amazon: through technological disruption or simpler tactical interventions that catch other firms unaware.

The most obvious way of doing so is through product. Providing more unique products and services – such as own-brand or exclusive lines, or deals including unusual extras – gives customers more of a reason to choose you over other competitors.

Rethink your physical footprint: make it easy for customers to see for themselves.

One-way Amazon competes is through sheer convenience. Nevertheless, it starts off weaker in sectors where quality is a priority. That's why Amazon has made a point of keeping its property overheads low through warehousing and is exploring bricks and mortar stores as 'showrooms'. It knows in sectors such as groceries, home electronics and clothing, consumers prefer to judge quality before they buy.

While many bricks and mortar retailers have an array of showrooms ready to go, changing trends in shopping habits mean they may still be behind the curve. Commercial pressures have forced firms to reduce their physical footprint: for many, the next challenge will be ensuring the stores they have are in the right places and advance from a one-size-fits-all approach that no longer works.

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Messengers

Who We Listen to, Who We Don't and Why

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All of us, at some time or other, have experienced the frustration of not having our ideas and proposals listened to. It is a frustration that can quickly turn to annoyance when someone else – maybe from a different department or, worse still, an outside 'agency' – says exactly the same thing we've been saying for weeks, and suddenly everyone thinks it's the best idea since sliced bread. The fact that nothing about the idea has changed, or that the proposal now being enthusiastically embraced is the same one that only a few days before was roundly rejected, barely seems to register.

This commonplace scenario illustrates that it is often the '*Messenger*' rather than the *'Message'* that carries sway: a phenomenon that will likely be familiar to many working in the behavioral sciences. Namely, that when it comes to messages designed to influence attitudes and change behaviors the entity delivering those messages – *a.k.a. the messenger* – can be as important, sometimes more so, than the substance of the message itself (Dolan, Hallsworth, Halpern, King, Metcalfe, & Vlaev, 2012).

When a messenger communicates information something intriguing happens. They become connected to the content of that message in the listener's mind (John, Blunden, & Liu, 2019). This association can have a dramatic effect on how that messenger and their messages are evaluated. Consequently, we don't always listen to people (or other sources of information) based on the content or accuracy of what they are saying. Rather, we listen to those perceived to possess particular traits or attributes that signal that their messages are likely to be worth listening to. This commonly overlooked insight suggests that the messenger has a much more fundamental role in the influence process than just communicating the message.

They *are* the message.

Messengers, Hard and Soft

Our two-year program of research and subject of the book *Messengers: Who We Listen To, Who We Don't and Why?* (Martin & Marks, 2019a, 2019b) is built upon two broad categories of messenger: hard and soft. Hard messengers have their messages accepted because they are perceived to possess superior *Status*. Soft Messengers, in contrast, are listened to because audiences feel a *Connectedness* to them. Within these hard and soft categories lie eight fundamental traits, four hard-related and four soft-related, which each reliably impact whether or not people will listen to a messenger.

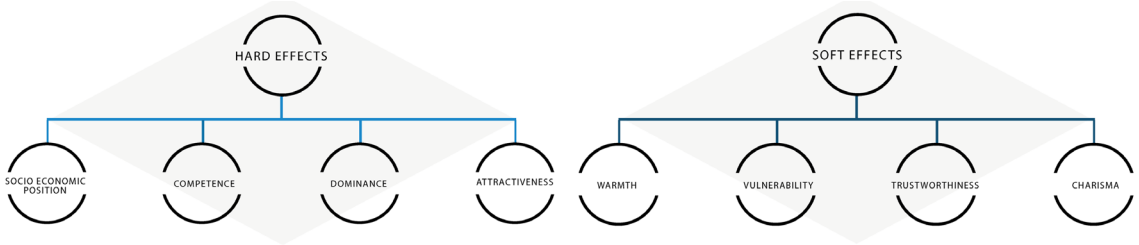

Figure 1: There are two types of messenger: hard and soft. Within each of these broad categories lie four specific traits.

In this essay we briefly outline these eight messenger effects and how they influence the extent to which people will listen to, accept and act upon a messenger's message. We also highlight the broader impact these fundamental messenger effects have on our society. Not

just in terms of who we are more likely to listen to, but the resultant impact on what we believe and who we become.

Hard Messengers

Hard messengers possess, or appear to possess, elevated status. Messengers with high status are influential in groups and societies because they are believed to possess power or useful qualities that may be valuable to those around them. Think CEO of a company or the captain of a sports team. Typically, we associate status with hierarchies in the workplace because they provide a clear organizational structure where those at the top make the important decisions and wield the greatest influence. But status hierarchies are also found in our schools, family groups, our networks of friends and associates, and our local communities. Our research has identified four important traits that contribute to status-driven messenger success: *socio-economic position, competence, dominance* and *attractiveness.*

Socio-Economic Position

Socio-economic position is important because it communicates the kind of lifestyle a person enjoys; the social circles they inhabit; and the resources they have access to (Kraus, Park, & Tan, 2017). A messenger's socio-economic position can be inferred from all sorts of signals, such as the cars they drive (Guéguen, Meineri, Martin, & Charron, 2014), the clothes they wear (Nelissen & Meijers, 2011), and their motivation to engage with others (Kraus & Keltner, 2009). One study even found that people could make accurate assumptions about a messenger's income, social class and their parents' educational background, simply by viewing their Facebook profile picture (Becker, Kraus, & Rheinschmidt-Same, 2017). The conclusions people draw about a messenger's socio-economic position from such cues subsequently determine how favorably they treat them and how receptive they are to what they have to say.

Celebrities are the ultimate high-status messengers, which is not always a good thing. In 2018, health officials in China scrambled to contain a rumor regarding the effectiveness of the influenza vaccine after Canto-pop singer Kay Tse On-Kei claimed on WhatsApp, without evidence and contrary to expert opinion, that ninety percent of people who received the vaccine then caught the virus (Xinqi, 2018).

Competence

Just as we have a tendency to defer to messengers who exude elevated socio-economic position, so too do we defer to those who show signs of competence. Competent messengers are listened to because they are thought to possess the experience, skills and knowledge that can help others to achieve their goals. The cues we use to decide whether an individual (or an organization) possesses competence are as numerous as they are surprising. Clothes (Bickman, 1974), physical height (Lukaszewski, Simmons, Anderson, & Roney, 2016) and even the clocks positioned in company reception areas displaying the time in different countries provide observers with cues of competence (Leary, Jongman-Sereno, & Diebels, 2014). Competence even has a face.

Computational modelling techniques have led researchers to conclude that the competent face is mature-looking and attractive. It is typically less round than the average face, with higher cheekbones, a more angular jaw and a shorter distance between the eyebrows and eyes.

These principles hold true for both males and females. Simply *looking* competent can often be enough to convince people that a messenger *is* competent. This was well demonstrated in a study in which people were given 50 photographs of Chief Executive Officers to examine - half of them the CEOs of the 25 highest ranked companies listed on the Fortune 1,000, the other half drawn from the 25 lowest ranked organizations - and asked to infer their personality characteristics. The results were astonishing. The faces rated by the volunteers as the most competent tended to head the more profitable and successful organizations, while those judged to be less competent tended to be in charge of the less financially successful companies (Rule & Ambady, 2008). The results were not limited to male appointees, nor solely to business. When researchers showed people pictures of female CEOs the results were consistent (Rule & Ambady, 2009). And when asked to provide intuitive competency ratings after viewing photographs of politicians, observers' impressions were highly correlated with the actual election results (Ballew & Todorov, 2007).

Dominance

Dominant messengers impose on their audiences, often in a self-interested manner and at the expense of others. Their central goal is to triumph in competitive encounters. Dominance is therefore not just a behavioral outcome, as when one person bests another, but also a personality trait and individuals who possess it act competitively, even aggressively (Sidanius & Pratto, 2004). Dominant types are combative rather than cooperative and to the dominant messenger *"winning is more important than how you play the game"* (Altemeyer, 2006). So why do people listen to them?

From an astonishingly early age, a deeply embedded expectation resides in us all: to the victor, goes the spoils (Enright, Gweon, & Sommerville, 2017). Cues of dominance and the beliefs we have about how others will respond to them are so deeply embedded they can be recognized by children as young as 10 months old (Mascaro & Csibra, 2014). This is because dominant individuals have the capability to inflict costs and endow benefits onto others. We therefore use dominance as a cue to navigate our social environment and frequently reward those who possess it with increased attention and deference. No surprise, then, that dominant messengers are frequently effective messengers. But they are not without their limits. Dominant messengers typically thrive when conflict, competition and uncertainty are rife. When choosing a CEO for a company whose share price is falling and whose employees are stressed, studies show dominant candidates are more likely to be favored. But when company performance is good and employees feel psychologically safe, less dominant leaders are selected. The same is true in politics, leading some to stoke fear in order to create a climate that favors their dominant disposition (Laustsen & Petersen, 2015).

Attractiveness

The fourth hard messenger effect is attractiveness. Rather than possessing instrumental value like superior knowledge or power, the attractive messenger can have a powerful effect because they have high *mate value*. As a result, societies' beautiful are often given preferential treatment, awarded higher status and so wield greater influence than less attractive members. In the labor market, attractive employees are more likely to be offered jobs, gain promotions and earn more than their average-in-appearance colleagues - a phenomenon that has become known as the 'beauty premium' (Maestripieri, Henry, & Nickels, 2017). It is possible that attractive employees receive additional workplace benefits simply because other people

look up to them and prefer their company. However, in some organizational contexts there may be genuine differences in productivity between them and their less attractive counterparts. For example, one study looked at the effect of a salesperson's attractiveness on their ability to successfully sell prescription drugs to physicians. Trained doctors tend to deny their vulnerability to succumbing to an attractive messenger, but the data tells a different story. The results showed that the attractiveness of the salesperson was related to the amount of drug the doctors prescribed (Ahearne, Gruen, & Jarvis, 1999).

Soft Messengers

The standout feature of Soft Messengers is the *connectedness* audiences feel towards them. Humans are social animals and have a strong desire to form connections, bond and cooperate with others. People don't always look to those with status for information. Sometimes they prefer to hear from their friends, those they trust, and the people who are 'like them'. Our research finds the four most important traits that contribute to connectedness-driven messenger success are: *warmth, vulnerability, trustworthiness* and *charisma.*

Warmth

Warm messengers care about their audience's welfare and want to cooperate rather than compete with them. They don't seek to demonstrate their status but rather, their benevolence. They do this by expressing positivity and using warm language to help smooth social interactions (Brown & Levinson, 1987). No one closes a conversation with Siri or Alexa by saying, "You take care now!" but we reliably signal our warmth and friendliness to other *people* using polite words and phrases. This can have a big impact. One study found that dominant sounding doctors were more than twice as likely to be sued for malpractice as an equally competent group of doctors who used a warmer tone of voice (Ambady, LaPlante, Nguyen, Rosenthal, Chaumeton, & Levinson, 2002).

Vulnerability

Our impulse to help others is an automatic, emotional response that is formed early in life (Davidov, Zahn-Waxler, Roth-Hanania, & Knafo, 2013). That's why messengers who signal their vulnerability will often be listened to more than those who remain closed off. Defense attorneys frequently present their clients as vulnerable individuals who suffered a lot in life to get judge and jury on side (Gray & Wegner, 2011). Contestants in talent shows often find themselves at an advantage if they possess a 'vulnerability' or 'back story' leading some to claim that their deficiencies and shortcomings are as important as their talents (BBC News, 2009).

Financial compensation can certainly incentivize people to give aid to those in need – social workers and nurses don't work for free – but this powerful internal motivation to help the vulnerable can sometimes cancel out the need for economic rewards. One study found that the more money people were offered, the more willing they were to allow someone to jump ahead of them in an airport line. That's hardly a surprise. The real surprise was people rarely took the money. Rather than a sign of inducement, it was seen as a sign of vulnerability. "If you're willing to pay $100 to cut in line you really must be desperate" (Oberholzer-Gee, 2006).

Trustworthiness

Trust is the third soft messenger effect and is crucial to any human relationship. Without it, it is hard to have successful romantic relationships, productive workplace collaborations or prosperous economic exchanges (Simpson & Willer, 2015). There are two broad forms of trust; competence-based trust, which is based on our confidence in a messenger's capabilities, and integrity-based trust, which is our belief that a messenger will uphold good moral standards even if a temptation to violate them arises (Kim, Dirks, Cooper, & Ferrin, 2006).

Truthfulness and trustworthiness are not the same thing. Research has shown that by following certain group norms a messenger can earn 'group credits' from their audience that can help to cover the cost of future mistakes or even wrongdoing they may engage in (Hogg, 2010). This goes some way to explaining how some messengers can lie to and deceive audiences yet still maintain their position and loyalty.

Charisma

The fourth soft messenger effect is Charisma which has been defined as a compelling attractiveness or charm that inspires devotion in others. But how do messengers compel audiences and evoke devotion? One important element is an ability to articulate a collective identity and vision (Conger & Kanungo, 1987). Another is what psychologists call surgency. To have 'high surgency' is to outwardly express greater levels of energy, enthusiasm and positivity through, amongst other things, body language (Sy, Horton, & Riggio, 2018). Indeed, studies find the most successful TED talks are typically made by presenters who use around twice as many hand gestures as their less successful peers (Van Edwards, 2015).

Listening... Believing... Becoming

In this essay we have briefly summarized our investigation into over sixty years' worth of research exploring the traits of communicators to whom people are most inclined to listen. The eight messenger effects identified – four of them 'status-driven' hard effects and the other four 'connectedness-driven' soft effects – underpin every aspect of daily social interaction and help explain three key processes. Who we listen to. What we believe. And who we become.

Listening – each messenger trait has an attention-capturing quality that is automatic and unthinking. However, the latest research suggests that those perceived as powerful and dominant, who can potentially have the greatest impact on our welfare, are attended to more quickly than softer types (Abir, Sklar, Dotsch, Todorov, & Hassin, 2018). Similarly, attractive individuals also draw attention particularly easily, due to the evolutionary and social value of this messenger trait (Tsikandilakis, Bali, & Chapman, 2019). Of course, just because a person commands attention this doesn't guarantee that any ideas, opinions or requests then expressed are accepted or complied with, but it does mean that they won't fall on deaf ears. The fact they're receiving attention means that their messages are more likely to be given consideration.

Believing – as people are drawn in by these messenger cues, their preparedness to believe what they hear also increases. Especially to the extent the nature of the messenger and their message are aligned. Life-saving advice sounds more convincing when delivered by someone with the appearance of competence. Instructions during a fire drill are more credible when

hollered by a dominant-sounding voice. Encouragement and empathy seem more genuine when delivered by a warm messenger.

Becoming – if listeners become more attentive and receptive, not only might they start to believe a messenger. Their belief can begin to shape how they then behave and ultimately who they become. A shy teenager might be prompted by an aggressively dominant friend to take drugs or join a gang; or they might be persuaded by a charismatic classmate to stick to the straight and narrow. An adult's choice of career or partner might be shaped by the influence of one particularly powerful messenger. So too might their decision to vaccinate their child or not. An apolitical person may be turned into a serial voter by a celebrity. In some cases it might even be the celebrity that is voted for, leading to the possibility of an entire country's future becoming shaped not necessarily by a proficient messenger but simply one who is prominent and dominant. Our fundamental personalities may be genetically coded and remain relatively stable over time.

But everything else in our lives is fair game... to the messengers in society that we listen to.

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All of One or One of All?

Variety-Seeking in Simultaneous and Sequential Financial Decision-Making

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Financial decisions are an everyday practice. And we frequently spend, save, borrow and invest money. These decisions range from time-consuming analyses, to habitual, unconscious behaviours. There are many factors that can influence financial decisions, among which whether we make sequential decisions, one choice at a time, or simultaneous decisions, many choices in one go. Simultaneous differs from sequential choice as it requires us to predict our future preferences across varying time horizons, while making multiple decisions at once. As a consequence, simultaneous decisions have been found to increase choice diversification outside the financial context, whereas sequential decisions result in more consistent choice selections (Simonson, 1990).

However, within a financial context, it is currently less clear whether simultaneous (vs. sequential) decision-making leads to more variety-seeking. While variety can be desirable in certain financial contexts, it is less so in others. For example, diversification of investment assets can spread risk, whereas consistency in saving or loan repayments can be helpful. Financial service providers are often able to design the choice context, determining whether consumers need to make sequential or simultaneous decisions. Hence it is important to understand how this type of choice presentation steers financial decisions.

Theoretical Background

Diversification as a consequence of decision presentation has received considerable attention from consumer researchers. They have consistently found that people who make multiple decisions at once for future separated consumption diversify more, compared to people making decisions one after another (e.g. Simonson, 1990; Read & Loewenstein, 1995; Read et al., 2001). However, researchers are less like-minded about the reasons for diversification in simultaneous (vs. sequential) choice. Whereas Simonson (1990) argues that this difference is due to uncertainty avoidance (i.e. not knowing what our future preferences will be) and consequently risk aversion, others (Read & Loewenstein, 1995) have explained it through time contraction (i.e. the tendency to compress time intervals) and choice bracketing (i.e. the tendency to treat choices that are framed together differently from those that are framed apart).

Although previous research reveals that variety-seeking can be stimulated by offering all choices at once (i.e. simultaneous choice), findings might depend on the decision and consumption context. For example, Fox, Ratner and Lieb (2005) find that choice categorisation leads to increased variety-seeking, and Galak, Kruger and Loewenstein (2011) show that a low rate of consumption increases people's variety-seeking in simultaneous choice. While simultaneous and sequential decision-making have been compared mainly within the food consumption context (e.g. yoghurts or chocolate bars, Simonson, 1990; Read & Loewenstein, 1995) and entertainment contexts (i.e. movies or lotteries; Loewenstein, 2001), we question whether similar effects hold for decisions made in the financial context. Only a few have studied diversification as a result of decision strategy within such a context (e.g. Bernartzi & Thaler, 2001), but these studies involved low frequent decisions. Investigating the role of simultaneous choice in everyday financial decisions would be more comparable to the frequency of food choices in the initial papers mentioned. But still financial decisions can be very different from those in the consumption domain.

Presence of Value

Financial decisions often involve quantitative information and monetary amounts. And the inclusion of numerical values can elicit changes in our behaviour (Vohs, Mead, & Goode, 2008). A money-related context influences whether we approach decisions with a prevention or promotion focus (Tong, Zheng, & Zhao, 2013). In other words, it affects whether we look for safety and reduced losses or advancements and gains (Higgins, 1997). Research has revealed that, especially in a spending context, people deciding about money become prevention-focused (Tong et al., 2013). They opt for the safe option and stick to the status-quo (Chernev, 2004). This may mean that when they make multiple simultaneous decisions for future separated consumption, they stick to what was previously selected. Thus, in a concrete financial context, we anticipate that simultaneous choice leads to little diversification and the difference in variety-seeking between sequential and simultaneous decision-making may not hold.

Nonetheless, financial decisions are not always phrased in monetary terms. If presented in terms of personal goals (like the pursuit of ideals and aspirations), the focus of the financial decision may move away from numerical values towards a non-monetary outcome, activating a promotion focus (Zhou & Pham, 2004). Here, people are more risk-seeking and prefer exploration (Pham & Avnet, 2004). Therefore, we expect that moving away from monetary towards goal-oriented decisions will activate a promotion focus, translating to reduced risk aversion and increased variety-seeking in simultaneous decision-making.

Goal Duration

Within the financial context, goals can be short- or long-term, also possibly influencing decision-making. When the achievement of the goal is far in the future, it may feel less urgent (Mitchell et al., 2008; Ballard, Vancouver, & Neal, 2018), resulting in more risk-seeking behaviour (Mishra & Lalumière, 2010). The opposite holds when goals are relatively short-term (Mitchell et al., 2008) and choosing between them feels like a trade-off (Dhar & Simonson, 1999). Consequently, it could be anticipated that the time horizon connected to the decision's goal will impact people's variety-seeking during simultaneous choice. Short-term goals may enhance the variety-seeking in simultaneous choice, whereas long-term goals may reduce it.

Therefore, in the current research we test the presence of variety-seeking in simultaneous financial decisions and assess whether the framing of choice as (non-)monetary and/or the decision time horizon has an impact. See Table 1 for the specific hypotheses.

Hypothesis 1	Variety seeking does not differ between simultaneous and sequential choice in financial decisions that involve monetary values.
Hypothesis 2	Variety seeking will be higher for simultaneous choice than for sequential choice in financial decisions that are focused on non-monetary financial goals.
Hypothesis 3	Time horizons will impact the variety seeking in simultaneous rather than sequential choice. Variety-seeking for short-term goals will be higher than for long-term goals in simultaneous choice.

Table 1: Hypotheses

Study

To test the impact of simultaneous (vs. sequential) choice on the level of diversification in financial decisions, a 2 (Choice presentation: simultaneous vs. sequential) × 2 (Goal time horizon: short-term goals vs. long-term goals) between subjects scenario study was conducted among 310 American adults (M_{age} = 36.78, SD_{age} = 12.33, 51.6% male) on Amazon Mechanical Turk. Participants were introduced to a new hypothetical feature of their bank app that rounds up purchases and transfers money into their savings account. Participants were told that unique to this feature was the possibility to alter the round-up amount ($0.10, $0.50 or $1.00) and vary the saving goal per week. An example explaining the new feature was included.

First, participants had to name either four 6-month goals (short-term goals conditions), or four 10-year goals (long-term goals conditions). Second, participants needed to set-up the new feature. Depending on the assigned condition, participants were asked to indicate one round-up amount ($0.10, $0.50 or $1.00) and one goal the round-up amount would contribute to, either for the upcoming four weeks at the same time (simultaneous choice conditions) or for each week separately (sequential choice conditions)[1].

Diversification was measured by both the number of different round-up amounts and goals selected across the four weeks. Amount diversification ranged from 0 (same amount was selected each week) to 2 (all different amounts were chosen across the four weeks) and goal diversification ranged from 0 (same goal was selected each week) to 3 (all different goals were selected across the four weeks).

[1] This manipulation of simultaneous and sequential choice was similar to Simonson's (1990) Study 1.

Results

A two-way ANOVA of choice presentation and goal time horizon on both the level of round-up amount and goal diversification confirmed part of our hypotheses (H1 & H2). The level of diversification across conditions depended on the type of choice, but the time horizon of the goal had no influence.

For the *diversification in round-up amount* the choice presentation did not have a significant effect ($F[1, 306] = 0.829$, $p = .363$). Neither was there a significant effect of the goal time horizon ($F[1, 306] = 0.150$, $p = .699$) or an interaction effect ($F[1, 306] = 0.188$, $p = .665$).

For *goal diversification*, however, the choice presentation did have an influence ($F[1, 306] = 36.311$, $p < .001$). In line with previous literature, participants in the simultaneous choice conditions diversified their goal decisions more (i.e. selected a larger number of different goals to save for) ($M = 2.44$, $SD = 1.05$) than participants in the sequential choice conditions ($M = 1.67$, $SD = 1.20$, see Figure 1). Again there was no significant effect of the goal time horizon ($F[1, 306] = .317$, $p = .507$) or an interaction effect ($F[1, 306] = 1.328$, $p = .307$).

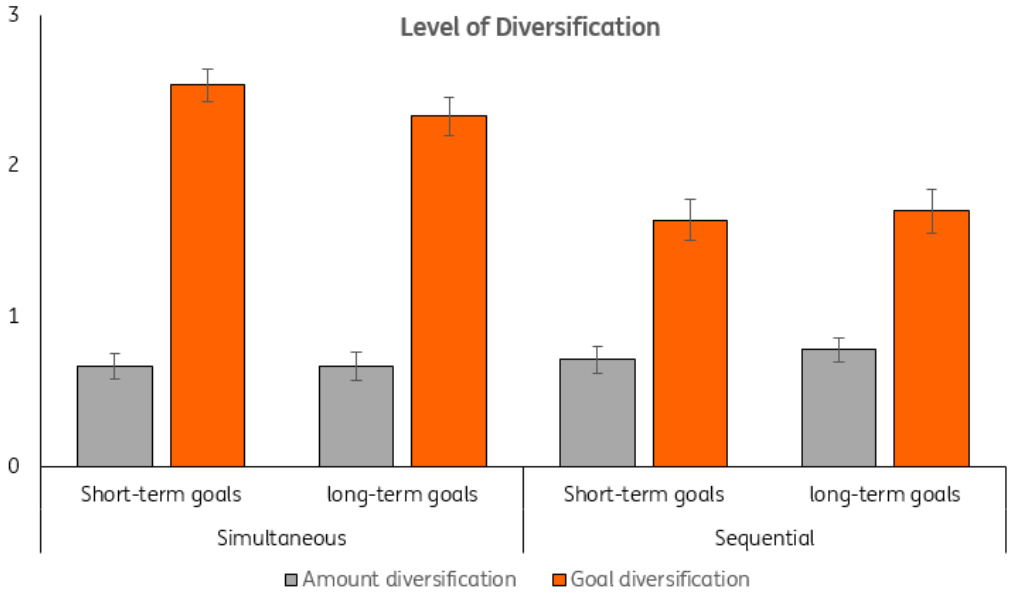

Figure 1: Level of diversification in round-up amount and goal across conditions. *Note:* For amount diversification, all conditions did not significantly differ (*t's* (306) < 0.951, *p* > .343). For goal diversification all conditions differ significantly (*t's* (306) > 3.480, *p's* < .001), except for the simultaneous short and long term goals conditions (*t* (306) > 1.151, *p* = .250) and the sequential short and long term goals conditions (*t* (306) > 0.317, *p* = .752). Error bars represent ± 1 standard error.

Discussion

It is essential for financial institutions to understand the impact of how they design decision environments as selecting more variety within the financial context is not always in the best interests of consumers. In this research, we explore the extent to which the decision context (simultaneous or sequential) can trigger variety selection.

We find that when the choice to automatically round up purchases to increase savings is presented as simultaneous, people are more variety-seeking, compared to when the choice is presented as sequential. However, this only occurs when the decision is framed in non-monetary terms (i.e. goal attainment). People save for a larger number of different goals when making simultaneous choices. Interestingly, variety-seeking does not appear to differ between simultaneous and sequential choice for monetary decisions (i.e. round-up amounts). The introduction of different time horizons also doesn't prompt differences between those making simultaneous choices, or those making sequential choices.

Our findings are a product of the decision context created within this study (i.e. presenting the choice as simultaneous or sequential). In comparing our results to previous studies that use a product-selection context, we have identified the presence of numerical values and varying time horizons as two key context variants. It is, however, important to recognise that our financial choice is different from a choice in the consumption context in other ways too, potentially contributing to people's variety-seeking.

Firstly, whereas variety-seeking within product selection in previous studies can be rationalised through the diminishing utility of consumption (Read & Loewenstein, 1995), multiple financial contributions to a goal might not create diminishing utility given that it gets us closer to achieving the goal. Secondly, as goals are personal aspirations with a personal value, the opportunity cost of selecting one over another may be higher, making the decision more difficult and increasing variety-seeking (Dhar & Simonson, 1999). And thirdly, as the action in our study is the contribution of funds towards a goal, while beneficial in the long-term, the choice may be perceived as a short-term loss, resulting in a decision that is framed around loss. We mention these variants to highlight additional features of the study we think relevant to our results and that deserve additional investigation.

It must be noted that our investigation of variety-seeking in simultaneous and sequential everyday financial decisions is limited. Within this study, we provide the first evidence that increased variety-seeking in simultaneous choice does not always occur, but does hold when the decision relates to a non-monetary choice. More research, in particular field studies, is needed to validate our findings. We believe that our findings combined with future research will be very useful to not only financial institutions but also to consumers wanting to make informed financial decisions themselves.

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Pro-Environmental Behaviour

We Care Because Others Do

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Introduction

Climate change and environment conservation are the defining global challenges of our time (World Economic Forum, 2019). While most mitigation efforts are still required at the scale of industry and policy making, behavioural change at the individual level is also needed.

Individuals can combat environmental threats in several ways, from improving housing energy efficiency to limiting their meat consumption or riding public transportation. Several psychological motivators and barriers play a role in determining this pro-environmental behaviour[1] (hereafter PEB). After all, conservational decisions often represent trade-offs between individual present sacrifices and collective uncertain benefits in the future.

Using data from the European Social Survey, this paper presents new insights into the complex interplay of interpersonal, intrapersonal and external social influences on individual PEB. Central to this paper is the question whether personal factors, social factors or a synergy of the two best explain why individuals do, or do not, behave pro-environmentally.

We highlight three main findings. First, social factors including peers' behaviour are among the strongest motivators of personal environmental decisions. Second, the sense of social efficacy not only improves personal PEB directly, but it also does so indirectly by enhancing the sense of self-efficacy of individual actions. Third, individual concerns about energy affordability can turn into a barrier to PEB when such concerns increase excessively.

This leads to important implications. It demonstrates that individual behaviour is strongly influenced by the behaviour of others, and that social influence could be harnessed to develop effective strategies to encourage more sustainable decisions and climate resilient behaviour.

Data and Framework

We use data from Round 8 of the European Social Survey (ESS) conducted in 2016-2017, which included two unique modules covering questions on individual and public attitudes to climate change as well as on energy preferences, concerns and use behaviours.[2] Our sample is composed of approximately 30,000 individuals, aged 15-85, living in 21 European countries.[3]

We analyse (1) how personal and social-related factors explain individual pro-environmental behaviour, and (2) the extent to which these factors interact with each other as barriers or motivators for positive environmental behaviour. We use the value-belief-norm framework (Stern, 2000) for this analysis and extend it with personal beliefs and norms related to the behaviour of others.

[1] Pro-Environmental Behaviour (PEB) is defined as the intensity of current individual behaviours to reduce energy use, that is behaviours related to daily life housing, transport, consumption, etc.

[2] The ESS is a cross-national survey conducted face-to-face every two years in Europe since 2001. It is representative of the population of each of the participant countries, following a strict random probability sampling. Further details on the survey and freely downloadable data are available at www.europeansocialsurvey.org/data/.

[3] Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Hungary, Ireland, Island, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

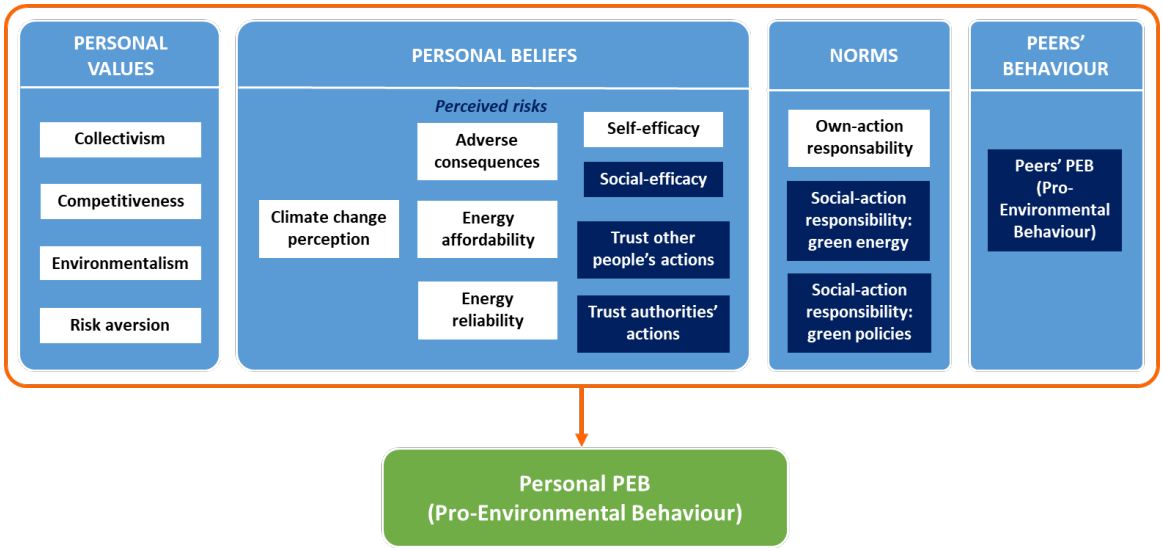

Figure 1: Value-belief-norm theory (Stern, 2000), adapted by the authors

In Figure 1, the fundamental idea that personal PEB is driven by personal values, beliefs and norms about the individual himself is represented in the white boxes. The dark-blue boxes add several social-related factors to the original model, following the literature on the influence of social norms and social comparisons on environmental decision making and behaviour (Frey & Meier, 2004; Schultz et al., 2007; Allcott, 2011; van der Linden, 2015; Lede & Medealy, 2018). The specific definitions and measures we apply to the ESS data are shown in Figure 2.[4]

[4] The factors' structure was validated in a principal component factor analysis. To facilitate the interpretation of results, all variables were standardised.

FACTOR	VARIABLE	DEFINITION AND MEASURE
PERSONAL VALUES	Collectivism	Orientation toward in-group and common values over self or individualistic values. It is a continuous index measuring the importance of (1) helping people and caring for others well-being, (2) understanding others, (3) being loyal and devoted to close people, and (4) people having equal opportunities and being treated equally.
	Competitiveness	Preference for achievement and material rewards for success in contrast to the preference for cooperation and modesty. It is a continuous index measuring the importance of (1) being successful and that people recognise personal achievements, (2) being rich, having money and expensive things, and (3) reverse of being humble and modest.
	Environmentalism	Intrinsic preference for ecology protection, conservation, and preservation. It is a continuous measure of the importance of caring about nature and looking after the environment.
	Risk aversion	Preference for uncertainty avoidance. It is a continuous measure of the reverse of likeness and willingness to take risks and looking for adventures.
PERSONAL BELIEFS	Climate change perception	It is a continuous measure of the extent to which someone believes that world's climate is indeed changing due to increases in temperature over the past 100 years.
	Perceived adverse consequences risks	It is a continuous measure of the extent to which someone is worried about the adverse consequences of climate change on natural and human systems.
	Perceived energy affordability risks	It is a continuous measure of the extent to which someone is worried about energy becoming too expensive for many people in his country.
	Perceived energy reliability risks	It is a continuous index measuring the extent to which someone is worried about his country being too dependent on (1) energy imports, (2) using energy generated by fossil fuels, and (3) potentially subject to energy cuts.
	Self-efficacy	It is a continuous measure of the extent to which someone believes that limiting his own energy use can indeed help reduce climate change.
	Social-efficacy	It is a continuous measure of the extent to which someone believes that large numbers of people limiting their energy use could indeed reduce climate change.
	Trust other people's actions	It is a continuous measure of the extent to which someone expects that large numbers of people will actually limit their energy use to try to reduce climate change.
	Trust authorities' actions	It is a continuous measure of the extent to which someone expects that governments in enough countries will take action to reduce climate change.
NORMS	Own-action responsibility	It is a continuous measure of the extent to which someone feels a personal responsibility to try to reduce climate change.
	Social-action responsibility: green energy	It is a continuous index measuring the amount of electricity used in someone's country that someone thinks should be generated from green energy sources such as solar power, wind power and organic biomass.
	Social-action responsibility: green policies	It is a continuous index measuring the extent to which someone favours the following policies in his country to reduce climate: (1) taxes on fossil fuels, (2) subsidies on renewable energy, and (3) bans on sales of low energy efficient household appliances.
PEERS' BEHAVIOUR	Peers' PEB	It is a continuous measure of the average PEB of people similar to oneself in terms of country, region, gender and age.
OUTCOME	Personal PEB	It is a continuous measure of the frequency of current behaviours in daily life to reduce individual energy use, related to housing, transport, consumption, etc.

Figure 2: Value-belief-norm definitions and measures

What Factors Determine Personal PEB?

To better understand how personal and social-related factors explain individual PEB, we present in Figure 3 the empirical results of the framework proposed in the previous section.[5]

[5] The results presented in this paper are based on linear regressions. All regressions account for several demographic covariates, country-region fixed effects, robust-clustered standard errors, and post-stratification weights including design weights.

Our findings suggest that peers' PEB (β=0.79, *p*=0.00), personal environmentalistic values (β=0.17; *p*=0.01), and the feeling of being personally responsible for climate change (β=0.12; *p*=0.01) are the strongest motivators of individual green behaviours. Individual PEB also shows to be enhanced with a stronger sense of social-action responsibility, social efficacy, trust on other people's actions, collectivistic values, and perceived risks associated to climate change. Adding to the social-related factors, the household context (living with a partner and/or having children) also contributes to better environmental behaviour. In contrast, people with more competitive and individualistic values as well as older or with incomes higher than the country median seem to experience more barriers towards green behaviour.[6]

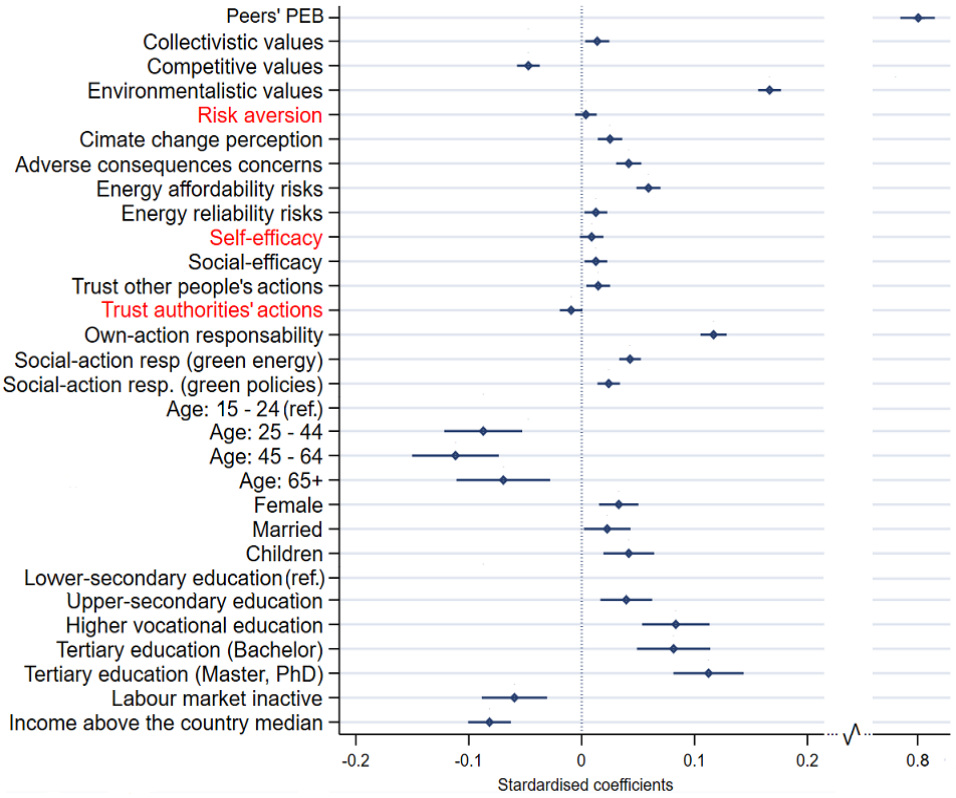

Figure 3: Determinants of individual Pro-Environmental Behaviour. *Note*: Coefficients in red are not statistically significant at 90% of confidence levels.

As shown in Figure 3, both the belief that climate is changing and being concerned about energy affordability separately improve personal PEB. However, we find further evidence that the interaction between these two perceptions can turn into a barrier for green behaviours: individuals convinced that climate change is real are much less motivated to take action when their concerns about energy affordability become too large. This highlights the importance of affordability matters in shaping people's green behaviour; when such perceived economic risks increase excessively, people can turn their sense of individual responsibility into a defensive attitude towards others (including governments) as the ones responsible to combat climate change (Kollmuss & Agyeman, 2002).

[6] Strikingly, neither risk aversion nor self-efficacy or trust in governments' action to reduce climate change seem to have a significant direct impact on individual PEB. In the following sections we dig deeper in the possible explanations of this result.

The Power of Peers' PEB

As mentioned in the previous section, the strongest motivator of individual PEB is the personal exposure to similar others who behave in a pro-environmental manner (peers' PEB). This peer-effect reflects the power of a social norm or social pressure in stimulating individual green behaviour (Cialdini et al., 1990; Lindenberg & Steg, 2007; Schultz et al., 2007).

Interestingly, we find further evidence that the positive influence of peers' PEB on personal PEB is larger among individuals that are relatively less concerned about the risks that climate change brings about (see Figure 4).[7] This suggests that social behaviour comparison or social norms could act as an extrinsic PEB motivator for those who are less intrinsically motivated. As implied by Figure 4, greater social pressure could enhance the PEB of those who are less concerned about the adverse consequences of climate change, even to the point that their behaviour improves more than that of those more intrinsically motivated. This is a typical example of the bandwagon effect, a psychological phenomenon where people do something primarily because other people's behaviours, regardless of their personal beliefs which may even be ignored or overruled (Corneo & Jeanne, 1997; Frederiks et al., 2015).

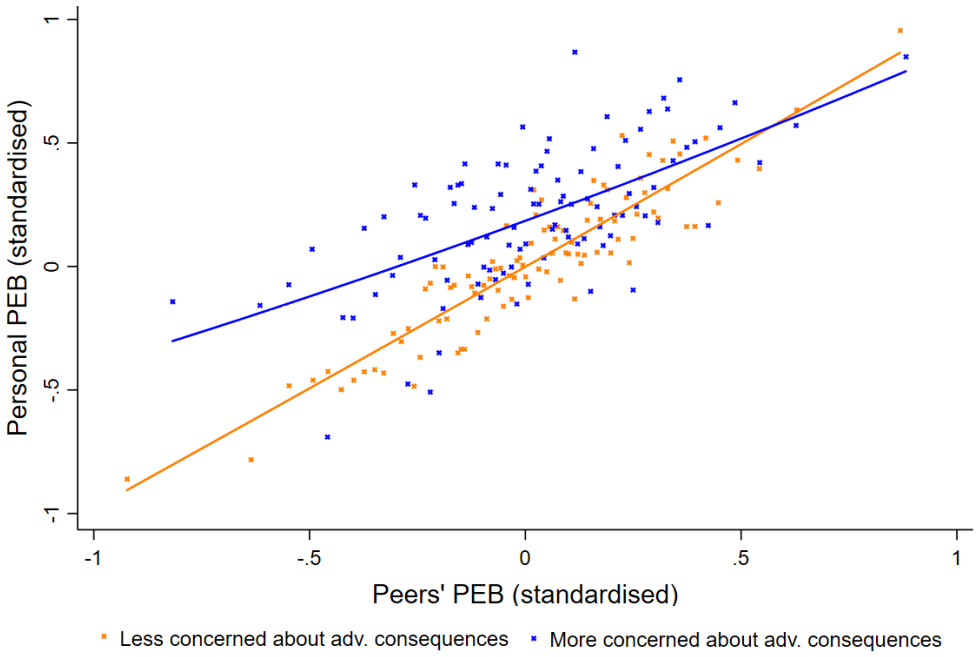

Figure 4: Effect of peers' PEB on personal PEB by concerns about the adverse consequences of climate change. *Note*: The figure shows the interaction effect after controlling for all covariates included in the original model.

As shown in Figure 5, we also find that the motivating effect of peers' PEB on personal PEB is slightly stronger among people with individualistic values rather than collectivistic ones.[8] For people with more collectivistic values, personal norms (own-action responsibility) seem to be the most important moderating factor of PEB. Further analyses suggest that the probability of individualistic people to show positive behaviours towards the environment is conditional on

[7] A set of interacted linear regressions were used to test for this moderation effect.

[8] Note that this effect pertains to individualistic vs. collectivistic values at the individual level. The effect does not hold at the country level when testing the differential effect of peers' PEB in more individualistic or collectivistic social environments.

their expectation that the government does so as well. This is also known as the "conditional cooperation" effect observed in voting, teamwork and tax compliance behaviours (Gächter, 2006).

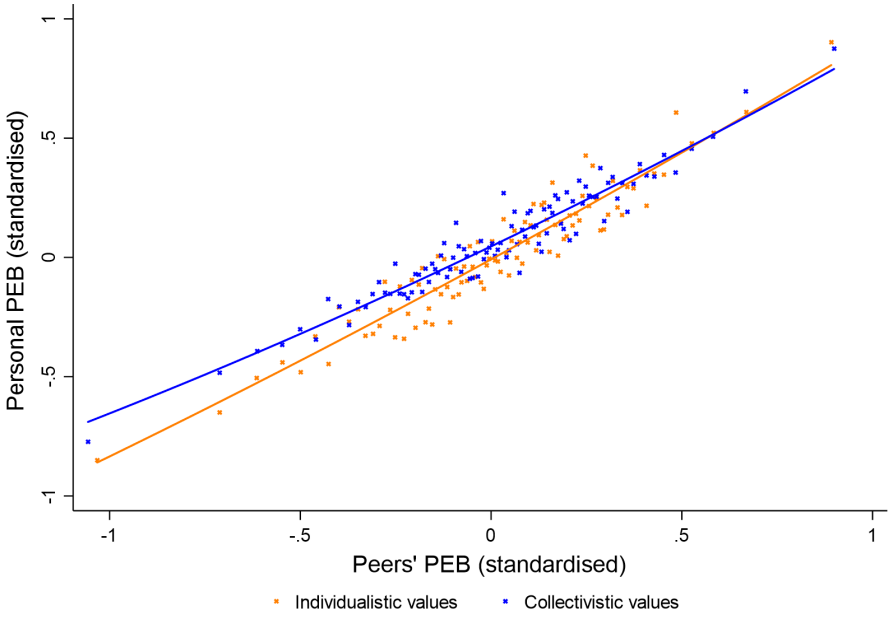

Figure 5: Effect of peers' PEB on personal PEB by collectivistic-individualistic values. *Note*: The figure shows the interaction effect after controlling for all covariates included in the original model.

Self-Efficacy vs. Social Efficacy as Motivators of PEB

In Figure 6, we illustrate the main result from the self-efficacy and social efficacy moderation and mediation analyses in relation to individual PEB. First, we find that self-efficacy – the belief that individual actions can make an impact to reduce climate change – positively affects personal green behaviours but only if individuals believe that climate change is actually happening (climate change perception) and at the same time are concerned about its adverse consequences. If these beliefs are not present, the influence of self-efficacy on personal PEB appears to be null. This might be explained because many people consider climate change risks as well as the benefits of mitigating them to be uncertain and mostly in the future or geographically distant, both reducing the perceived ability and actions to mitigate climate change (Leiserowitz, 2005; Swim et al., 2009).[9]

Second and more interestingly, we find that social efficacy – the belief that people as a group can make an impact on climate change mitigation – can directly motivate PEB, even when there are no beliefs or concerns about climate change risks. According to our findings, social efficacy is so powerful that it not only improves PEB directly, but it can also mediate the effect of self-efficacy on individual PEB. This finding is consistent with the psychology of climate change as a collective problem, as opposed to private problems, in that individuals tend to feel easily discouraged by the seemingly insignificant effects of personal behaviour. Therefore,

[9] Because a sizeable 10% of people in our sample does not believe that climate change is happening at all and another 27% report not to be concerned about climate change, we observe an overall null effect of self-efficacy on PEB in our basic model (see Figure 3).

psychological factors related to the impact of joint effort seem to play an extremely important role in motivating both personal environmental behaviour and the sense of efficacy of individual actions (Keizer et al., 2013; Frederiks et al., 2015; Williamson et al., 2018).

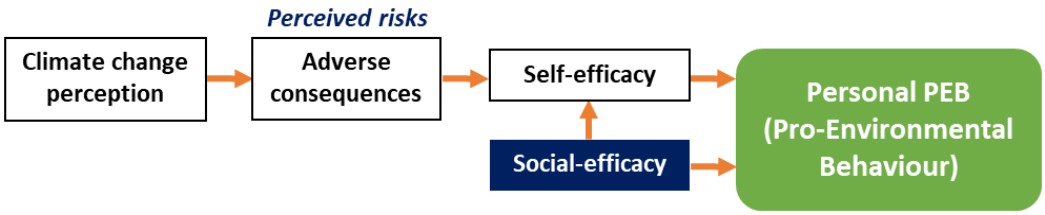

Figure 6: Effect of self-efficacy and social efficacy on personal PEB

Final Remarks

This paper has provided insights into the interplay of individual and social-related factors as motivators or barriers of personal environmental behaviour. We highlight the finding that the pro-environmental behaviour of peers as well as the belief that joint efforts can make an impact on climate change reduction are strong motivators of personal green behaviours. This finding implies that social comparisons or social norms could act as extrinsic drivers of environmental behaviour, especially for those that are less intrinsically motivated (e.g., due to stronger individualistic values, climate change denial or too much concern about energy affordability).

The extent to which social forces can drive individual pro-environmental behaviour significantly depends on personal values and beliefs; all factors likely to differ across cultures and countries. To design effective behavioural mechanisms to promote pro-environmental behaviour, further research on these potential differences is needed. In addition, there is more to learn about drivers and barriers of environmental behaviours beyond those investigated in this study, including for example cognitive biases such as loss aversion and temporal discounting, external rewards or punishments, and the objective circumstances under which environmental decisions take place (Anable et al., 2006; Frederiks et al., 2015).

On a final note, many people say that global problems require global actions. This paper shows that even if climate change might not be perceived by everyone as a global problem that requires individual action, the sense of social responsibility could stimulate individual behavioural change. Apparently, the more we believe or see that others care about the environment, the more we learn as individuals to care too.

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What Academics Can Learn from Industry

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Introduction

Companies are getting better and better at experimentation. They might not publish peer-reviewed papers, but they do take advantage of their access to thousands (or sometimes millions) of customers, as well as technology that enables trying lots of new things. Today, the most innovative businesses (Intuit, P&G, Google, Amazon, Netflix) have publicly stated they run thousands of experiments (Clarke, 2016). While this pace may only be achievable by the most sophisticated companies, experimentation platforms like Optimizely and Amplitude unlock off-the-shelf AB testing capabilities for small-to-medium sized companies. The end result is a high-speed learning model and a hard-to-ignore source of insights on human behavior and motivation.

As a behavioral science consulting firm that has worked with hundreds of companies from a broad array of industries, we see an opportunity for academics to pay attention to the insights this model has to offer. This article will pull from direct work experience and interviews with clients and partners. Our team has run over 50 experiments with companies across industries, including Facebook, Lilly, Aetna, Lyft, Kiva, AARP, as well as many smaller startups.

First, we'll focus on companies' growing appreciation for academic insights and how they are currently being used. Second, we'll highlight the under-explored opportunity – what insights academics can glean from the sheer volume of experiments that is happening at companies.

Application of Academic Insights by Companies

There are three insights that we think companies are particularly well-versed in. 1) They notice a difference between stated and revealed preferences; 2) Choice architecture matters; 3) People are influenced by social proof and norms.

1. There Is a Difference Between Stated and Revealed Preferences: Customers Don't Always Do What They Say They Will

Companies, for the most part, still rely on interviews, focus groups, and surveys to inform new feature development. However, with the growing ability to capture product usage and analyze data, companies are discovering that there is a difference between stated and revealed preferences (Samuelson, 1948). Customers might say they prefer one thing, but end up choosing something else.

The launch of Facebook's News Feed offers an example. Before this feature launched, Facebook users had to click on friends' profiles to see their updates. The News Feed pushed people's updates into a feed, enabling users to see all their friends' updates at once. Immediately after it launched, Facebook users were generally furious. One man, Ben Parr, even created a group called "Students Against Facebook News Feed" that gained 700,000 members within a number of days (Stephens-Davidowitz, 2017).

In this case, we might think a company would backtrack. Yet, Facebook did not do so: "Zuckerberg in fact knew that people liked the News Feed, no matter what they were saying in the groups. He had the data to prove it. People were spending more time on Facebook... And they were doing more there – dramatically more" (Kirkpatrick, 2010).

A second example of a gap between stated and revealed preferences is from Thumbtack, an online marketplace that connects and aggregates service providers like handymen and painters with people in need of their services. During onboarding, Thumbtack will ask service providers about their skillset, experience, types of jobs they may want, and how much they might charge for their services. The images below show which preferences Thumbtack might ask a handyman.

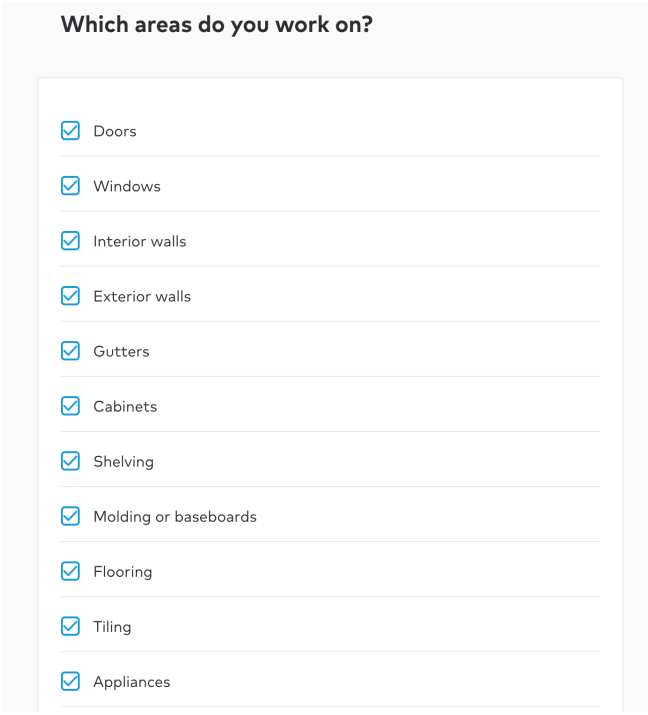


Figure 1: Onboarding question about work type preference

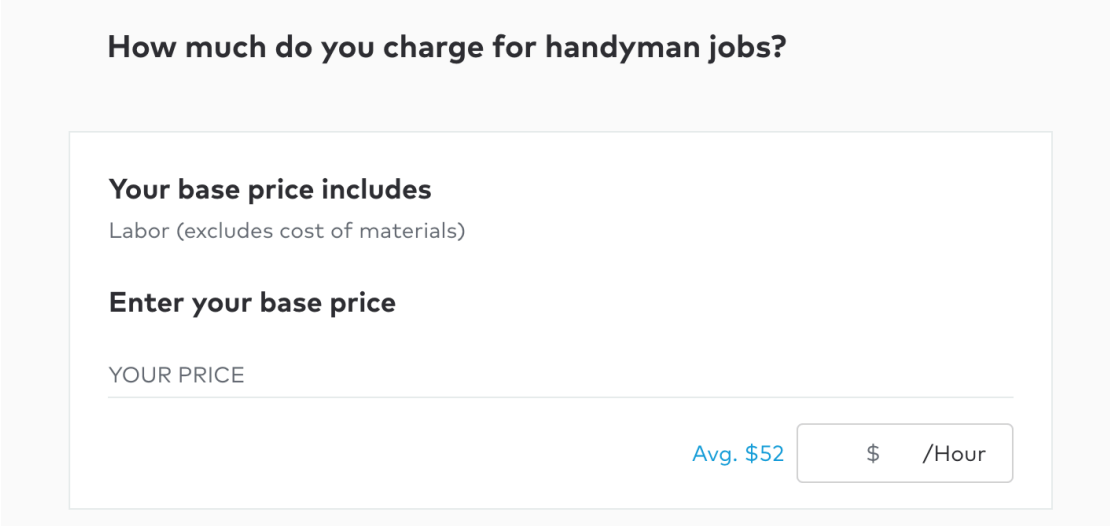


Figure 2: Onboarding question about price

Thumbtack has observed a significant difference between what jobs service-providers *say* they are willing to do, and what jobs they *actually take*. "Their revealed preferences are, on average, substantially broader than their stated preferences when it comes to finding new projects to complete," shares Lucas Puente, Lead Economist at Thumbtack. When Thumbtack offers

them jobs outside the realms of their stated preferences (perhaps involving a different type of property or task than they originally selected) or price points, but match their location and skillset, many still take the work on.

2. Choice Architecture, or How Options Are Presented, Matters

Companies have a growing appreciation that the *way* choices are presented to consumers, termed *choice architecture*, has a strong impact on consumers' decision-making. Many companies have internalized basic behavioral science wisdom that layout, range, and sequencing of options have an effect on what people ultimately choose (Johnson et al., 2012; Balz, Sunstein, & Thaler, 2014).

OKPanda, an English-language learning app, discovered the power of using choice architecture within their sign-up flow. Adam Gries, founder, explains that when the students first sign-up, they need to select what type of teacher they prefer. The main decision is between a native-speaking English teacher and a non-native English-speaking teacher. Through experimentation, OKPanda learned it was more effective, from a conversion standpoint, to have people answer a multiple-choice question upfront about their preferences than to present a list of teachers with key attributes listed on their profile (e.g., native or non-native).

Thumbtack has also experienced the power of choice architecture. They have found consumers are more likely to select the professional that first appears on the app who seems to meet their needs, particularly in certain categories where "done" is more important than "perfect." In other words, Thumbtack noticed a lot of users were "satisficing," a decision-making strategy where people select the alternative that is "good enough," rather than putting in effort to find the best possible choice (Simon, 1978).

3. People Are Influenced by Social Proof and Norms

The use of *social proof* by companies is widespread (Das et al., 2014; Alcott & Rogers, 2014; Amblee & Bui, 2010). Perhaps the best-known example of leveraging social norms to drive behavior change has been conducted by Opower. They demonstrated that presenting social norm messaging about how much energy people's neighbors were saving can be scaled to influence energy conservation across an entire community (Alcott, 2011; Zaval & Cornwell, 2016).

Information on what peers are doing can be especially enticing. Thumbtack shared that some of their most effective marketing campaigns revolved around the message of "what your neighbors are getting done on Thumbtack." Additionally, one of the authors, Kristen, ran an experiment with Arizona Federal Credit Union that used social proof to help reduce spending on eating out (Common Cents, 2018). An email was sent to people in the experiment with a subject line that asked: "Curious how your spending on eating out compares to others?" This email had a click through rate that was 2.4 times higher than previous emails sent by the credit union.

Lessons from Companies

Based on our work with hundreds of companies, three main ideas stand out as a good start for the field of social science to learn from companies:

1) There are more nuanced ways to think about friction,

2) There are ways to build intuition faster, even within an academic context, and

3) There may be benefits from research lacking generalizability.

1. Friction Is Complex – It Can Be Bad and Good

Behavioral science has shown that people can be deterred from taking action by even minor amounts of choice, added steps, time, effort, and decision-making. These types of behavioral "frictions" (perceived or real) generally decrease the probability that a given behavior takes place, and also account for a number of human biases (e.g., Murray & Haubl, 2007). For example, our propensity to stick with the status quo (Samuelson & Zeckhauser, 1988; Kahneman, Knetsch, & Thaler, 1991) and with defaults (Johnson & Goldstein, 2003), or avoid making difficult choices (Chernev, Böckenholt, & Goodman, 2016), are all examples of the power of friction. Designing for low friction is generally understood and accepted in companies. Evan Willams, founder of Twitter, has said that the key to making a fortune online is to remove extra steps from common activities (Wired, 2013).

The general approach of making designs simple and usable is accepted in industry, and focuses on the reduction of friction. However, there is an emerging understanding that some types of friction actually make designs more usable, not less.

The first way friction within a system can be helpful is that it helps change the cost-benefit equation by decreasing the perception of future costs. One example comes from Ethan Smith, Growth Advisor at MasterClass, an online learning platform. Like many other products, MasterClass originally asked users for their email and credit card on a single screen (see Figure 3).

MasterClass then tested separating the email field and credit card fields onto two different screens, which is in direct contrast to design 'best practices' that recommend fewer steps is better due to the extra click required (see Figures 4 & 5).

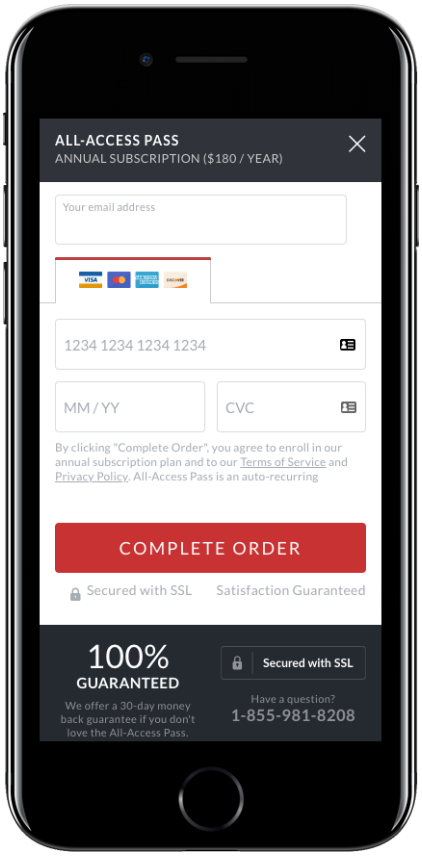
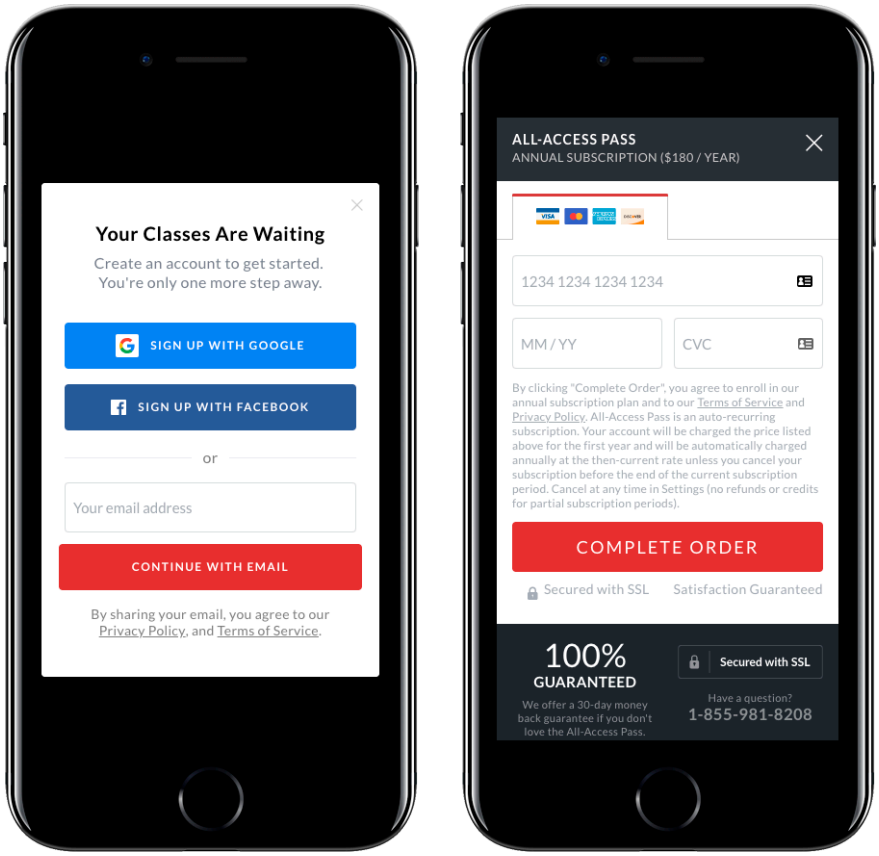


Figure 3: Email and credit card on one screen



Figures 4 and 5: Email and credit card split across screens

What MasterClass found, however, was a substantial increase in subscriptions, which is potentially attributable to the idea that even though the number of steps increased, the perceived level of "ask" on each step was reduced.

Goodui.org has reported similar results. Goodui.org is a platform that aggregates experimental results across different contexts, providing members with insights into effective design techniques. They report on a two-condition experiment. One condition has all the sign-up fields on one page, and the second condition breaks up the fields onto two pages.

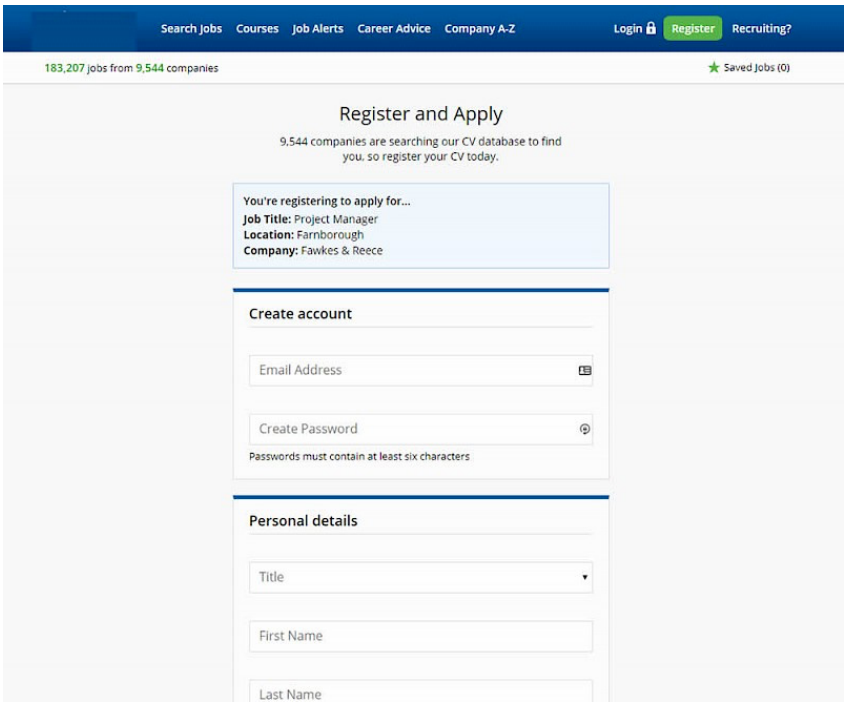
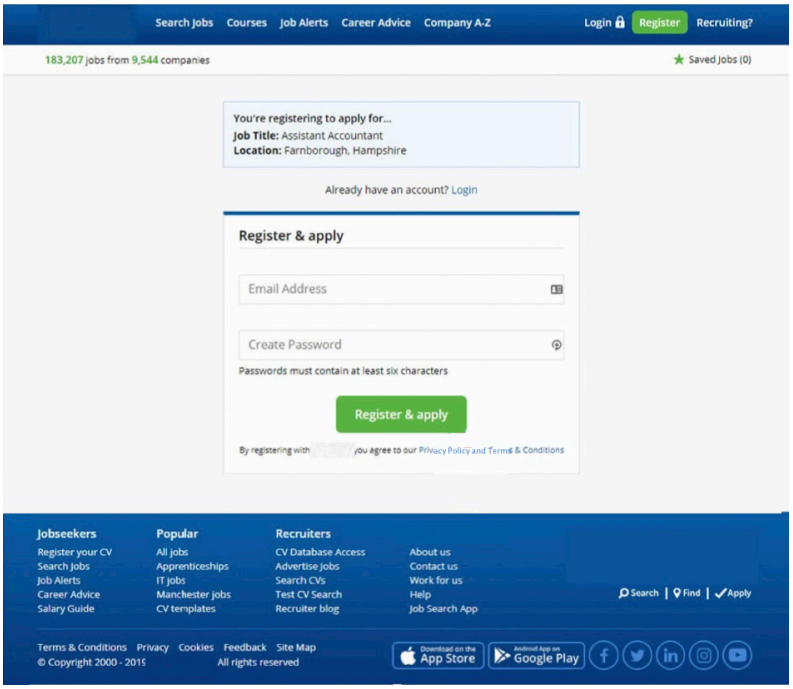
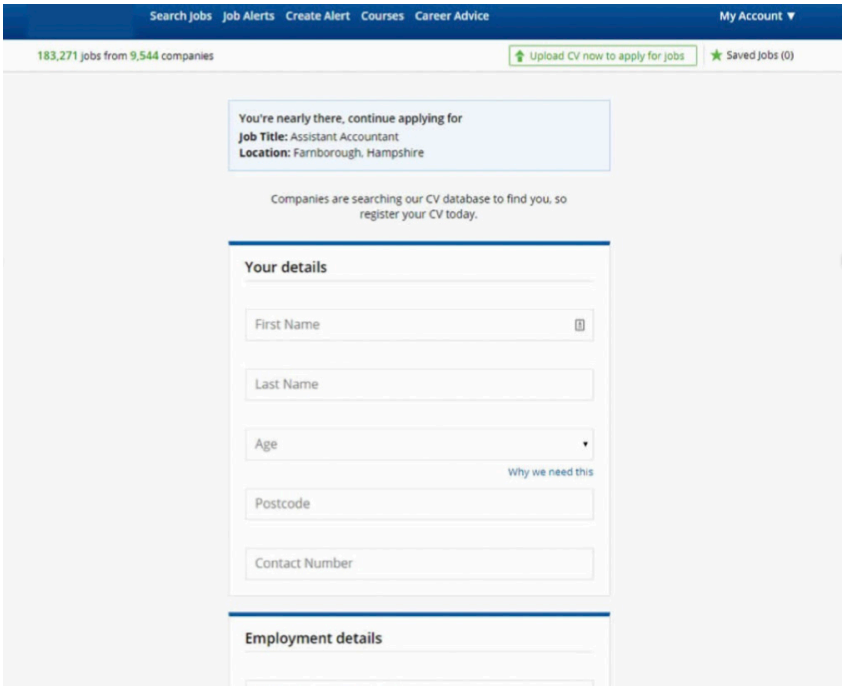


Figure 6: Create account followed by personal details on one screen





Figures 7 and 8: Create Account is on the first screen; Personal Details are on the second

Like MasterClass, the number of steps increased, but the amount of information collected stayed the same. And like MasterClass, doing this increased conversion (8.7% to 11.7%). Goodui.org includes this example in a series of five tests that all examine the effect of splitting up steps into multiple screens. Based on these five tests, they conclude that splitting up steps is a winning strategy that will likely increase conversion, with a 5.5% median effect.

A third example comes from Trunk Club, a clothing subscription service. To increase the number of site visitors that sign up for its service, Trunk Club tested a change to its sign-up flow. The new flow added more steps but allowed the user to focus on each question individually, with visuals supporting each question. Launching this experiment was a risk; the longer flow increased the number of opportunities a user had to drop out of the experience. However, the experiment results showed that the longer flow increased conversion by 133% (The Big Book of Experimentation, Optimizely).

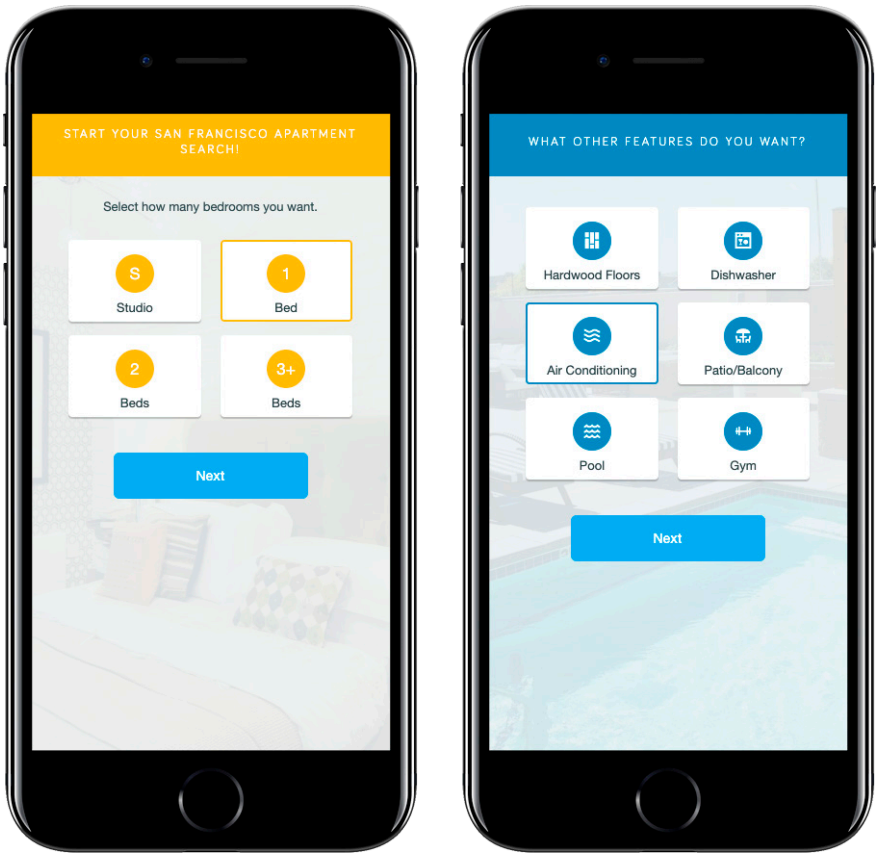
In these examples, people became more motivated to continue when there were more, not fewer, steps. Ethan Smith explains:

> Contrary to 'best practices,' adding more steps to a flow often does not reduce conversion. In fact, it can increase conversion. Users tend to focus on the current screen and the immediate decision of whether to continue or exit. They perform cost benefit analyses for each step. By reducing steps on each individual screen and separating them into more screens with fewer steps, the user perceives a reduced cost on each screen. This seemingly small change in the cost benefit equation can lead to dramatic increases in conversion.

It might be the case that there is a difference between *actual* friction and *perceived* friction. Breaking fields up into multiple steps does not allow people to fully consider all of the future costs in their decision making. They evaluate only one cost at a time.

Another type of "good" friction that increases conversion is friction that builds a customer's mental model of the product, and thus increases their intention to convert. Smith shares an example from Apartment List, an online apartment rental marketplace.

Apartment List increased conversion by adding relevant and easy to complete steps in their sign up flow (e.g., asking a user looking for an apartment how many bedrooms they need, their price range, and which features they want). While these additional questions increased friction for the user, these questions show the customer the potential benefits they will receive if they complete the flow. This change in the perceived benefit changes the cost benefit equation resulting in dramatically more users finding their new home.



Figures 9 and 10: User preferences shown at the top of the screen

This approach is currently being used at other companies. StitchFix is a subscription personal styling service. Given StitchFix's relative newness to the market, it may be unclear how the service works and what benefits it can offer potential customers. To mitigate this, StitchFix asks questions in its sign-up flow that clarify the benefits the service can provide. For example, as shown below, they cleverly highlight multiple benefits by asking "What are the reasons you're excited to try Stitch Fix?"

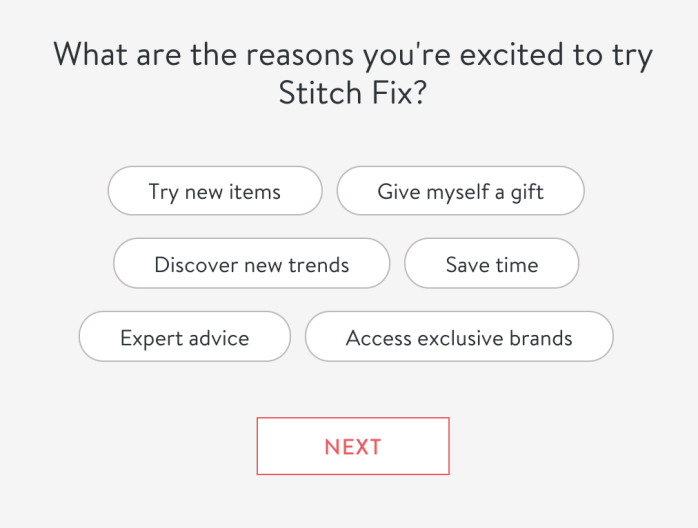


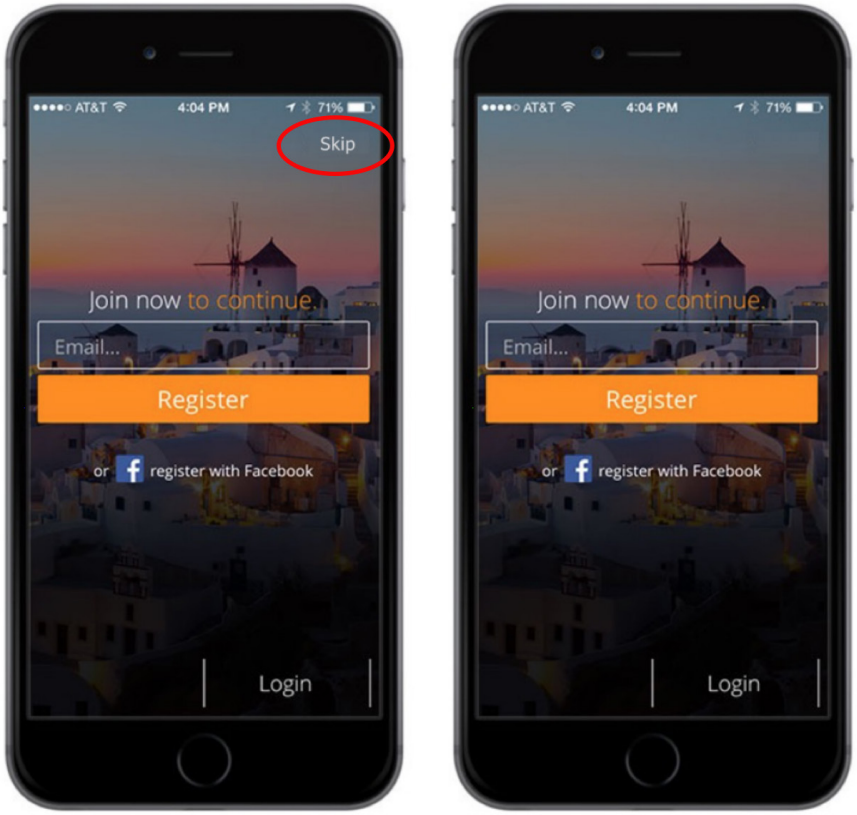
Figure 11: Question that helps the consumer understand the value of StitchFix

StitchFix also asks users if they want help with outfits for work, casual, or date nights. Without this question, users may assume Stitch Fix only handles one type of wardrobe – i.e., the business dress.

And finally, sometimes, friction might intrinsically be helpful. By slowing users down, it can increase general commitment and help them make better decisions. One example comes from Secret Escapes, a flash-sale travel company that offers discounted rates on 4-5 star hotels. Before launching their app, their internal team was conflicted about whether to allow users to see the travel deals without signing up (inputting their email and password). To test this, they ran an experiment. In the first condition, users were able to close or skip the sign-up screen. In the second condition, sign-up was required and no skip option was offered. The second condition, that forced users to sign-up, was the winning condition. It doubled the sign-up rate without negatively impacting reviews (see Figures 12 & 13) (The Big Book of Experimentation, Optimizely).

OKPanda observed a similar finding. People completed more language learning sessions when they were required to put down a credit card to activate the one-month free trial than those who were not asked to put down a credit card to activate it. Founder Adam Gries believes this was due to helping people actively commit to trying out the product. People who experienced no friction never fully committed to their free month.

Friction is complex. While most of the time, friction might prevent certain behaviors, companies are telling a more nuanced story. In this case, we show that some companies have found friction may be "good" if it serves to 1) decrease the perception of costs 2) increase attention to future benefits or 3) increase the likelihood of commitment. More research is needed to validate these hypotheses.



Figures 12 and 13: Skip option allowed vs no skip option. *Source*: The Big Book of Experimentation, Optimizely

2. Build Intuition Faster

Our experience is that shortening the cycle for intuition-building is one of the most useful parts of companies' execution speed. One of our clients, CUNA Mutual Group, asked us to help them with their unemployment insurance product, SafetyNet, which pays out up to $9,000 if the insured individual becomes unemployed. Building on the research that adding context to statistics helps people digest them (Barrio, Goldstein, & Hofman, 2016) we suggested the team translate the payout of $9,000 into something that a consumer could more easily relate to.

Within just a few days, CUNA Mutual Group launched an experiment. Some customers saw the original page, and some customers saw a new page with three added statements, "John paid rent," "Jen covered daycare," and "Sara paid medical bills" underneath the main benefit of the $9,000 payout. Within days, they had enough traffic to see that the new version had increased page-over-page conversion by 3%. With this data, they worked with their Marketing Department to implement the changes more formally with improved images and an integrated design.

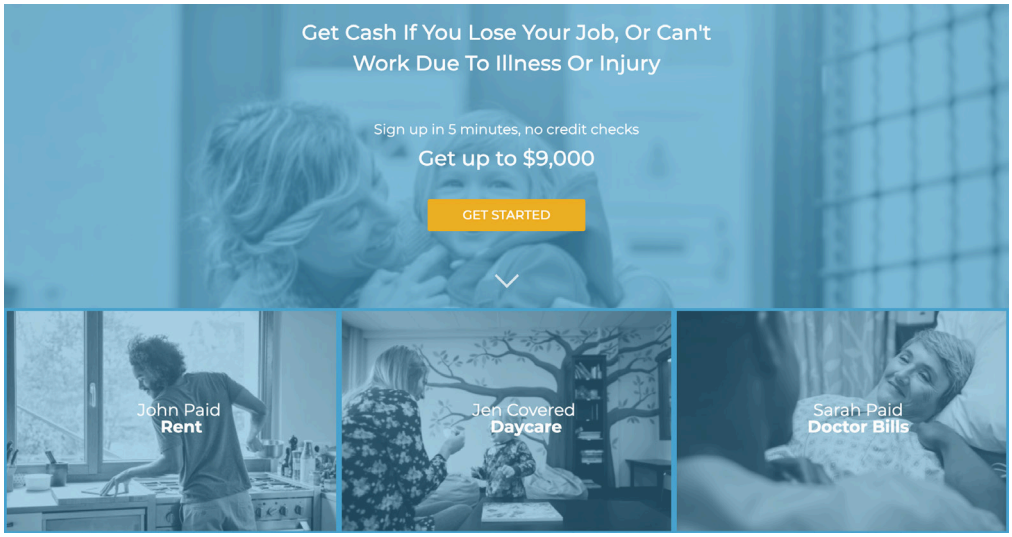


Figure 14: CUNA Mutual Group's job insurance page updated with concrete examples of how the benefit could be used

In addition to quickly running tests on their own websites, companies also often run tests using Facebook or Google ads. This strategy is often even faster, requiring less internal coordination and fewer approvals. Duke University's Common Cents Lab implemented such a test that informed a partnership with Lendstreet. With the goal of reducing consumer debt, the team wanted to understand the most effective ways to get consumers to call their credit card companies and ask for lower interest rates. The team launched a 7-condition experiment on Google AdWords with different messaging, and then measured the call rates for each message.

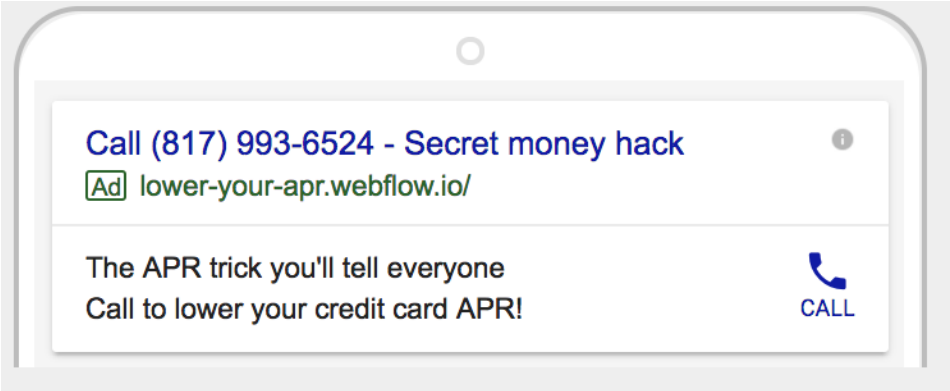


Figure 15: Example of what each ad looked like

Academics run pre-tests, but they are often confined to student samples or MTurk studies. When moving from lab testing to field experimentation, there might be risks. To mitigate these risks, companies have realized it is worth the investment to develop clever ways to conduct low-cost, low-risk pre-tests in the field.

3. What We Can Learn from a Lack of Generalizability

In academia, it's important to develop interventions that are able to generalize across a population. Generalizability is a measure of how useful the results of a study are for a broader group of people or situations; lack of generalizability is therefore often an evil to be avoided. Lack of generalizability can arise if the participant pool is limited to certain narrow character-

istics (e.g., small age range, narrow income band, specific location). Interestingly, companies don't appear to care about this. Imagine that a company launches a feature that it hopes will help all of their customers. Instead, a smaller subset of users actually opt in to use the feature. In this case, the company does not care about the intent-to-treat effect or to understand if the feature might have a similar effect on customers that do not opt in.

Instead, they analyze data to see if the feature increased their business metrics for the subset of customers that did opt in, compared to customers that did not. They are effectively ignoring selection bias – these two groups (people who opt in and people who don't opt in) may be completely different types of people. Yet, if the new feature improves business outcomes for this small subset, the company might put more effort into designing interventions for that subset in hopes they can convince more customers to opt in.

For example, a popular SaaS company completed an analysis of which users were likely to continue past the free trial period. They found that users were more likely to stay beyond the trial period if they had added another user, such as a colleague, to the service within the first week. The team then put significant effort into ensuring that all new users were nudged to add a colleague within the first week. As another example, Facebook employees have shared that in Facebook's early days, if a new user added 7 friends in ten days to Facebook, they were likely to be a user for life. Based on this correlation, the team designed a sign-up flow to get people to add 7 friends.

What appears to be happening is not a confusion on causality and correlation (although in some companies it might be), but rather a strategic decision. They have found it is easier to focus on learning from their best users, even if is a self-selected sample, than exerting effort to create a representative user sample that would generalize better.

Adam Gries of OKPanda shares that he, too, started with an initial strategy of "going after everybody." However, when the team looked at their user data, they found that only users who demonstrated interest in creating a "language learning plan" ended up being the most successful. The team, seeing this data, focused on getting more good users – the "plan-creating users" – and let go of trying to convert the super-casual users that had no interest in creating a plan.

Moreover, while this strategy will never allow practitioners to conclude the causal direction of an effect (for example, perhaps most successful users are the ones who would want to create a language learning plan), it does help practitioners narrow in on their most engaged customers.

We recommend that academics internalize this type of thinking for some research projects. At times it may be okay (and even desirable) to have behavioral insights that do not generalize to everyone. Focusing research on the subset of people for whom intervention would be most useful can be an easier and a potentially more impactful strategy.

Conclusion

Much has already been written about the rise of behavioral science and the demand from companies to apply academic insights to improve business outcomes. Indeed, last year's Behavioral Economics Guide opened with an introduction from Robert Cialdini on the golden

age of behavioral science. Cialdini, supporting this notion of bi-directional influence, suggested that this "love affair" between businesses and academics would develop into a "comfortable interdependence" moving forward.

And it is happening. Companies are increasingly looking to the social science world for insights on human behavior, in hopes they can build better products. Companies are also experimenting. They are learning what drives their customers' behavior. Often, the insights they discover are old news to the social science community. But sometimes, companies are on the edge of new and interesting insights that could lead to a greater understanding of human behavior. This can only be good for a more symbiotic relationship to develop.

The Authors

Kristen Berman co-founded Irrational Labs with Dan Ariely in 2013. She was on the founding team for the behavioral economics group at Google, a group that touches over 25 teams across Google, and she hosted one of the top behavioral change conferences globally, StartupOnomics. She co-authored a series of workbooks called *Hacking Human Nature for Good,* with Dan Ariely. These workbooks are being used at companies like Google, Intuit, Fidelity, Lending Club for business strategy and design work. Kristen's work has been featured in *The Stanford Innovation Review, TechCrunch,* and *Scientific American.*

Kristen also co-founded Common Cents Lab, a Duke University initiative dedicated to improving the financial well-being for low- to middle-income Americans. Under Kristen's leadership, Common Cents launched over 50 experiments with companies, touching tens of thousands of people.

Evelyn Gosnell is a Managing Director at Irrational Labs. Evelyn's work spans across a broad array of industries. She has launched major health initiatives with companies such as Aetna, developing and implementing behavioral training programs to be used at scale. She has worked with Google, Procter & Gamble, The World Bank, Maritz, AARP, CUNA Mutual, among others.

Evelyn leads Irrational Labs' Behavioral Economics Bootcamp, a part-time program for product leaders looking to apply behavioral insights to improving their product and services. Evelyn is also the Head of Product Development and Behavioral Science at Shapa, a health startup founded by Dan Ariely.

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Intuitive Behavioral Design

How to Empower Professional Investors

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Abstract

Any asset manager below one trillion USD in assets under management can be considered small-to-medium sized (Forbes, 2018). Over the course of 70 years, the asset management industry has become a copy-cat machine based on pseudo-innovative portfolio construction techniques, resulting in a high level of standardization in its service offerings (Schuller, 2015). Those stream-lined me-too products favor the survival of large asset managers, while digitalization and fee-pressure strengthen their edge (PwC, 2018).

We know from industries driven by competitive forces, that the development of a comparative advantage requires first principle (= creative and critical) thinking, through which value creating solutions are generated. This way of thinking increases in relevance, the more alpha-driven an investment strategy is supposed to be (Schuller, Mousavi, & Gadzinski, 2019). The vast majority of financial instruments claim to be alpha-driven (ICI, 2018). Their investment process and behavior, though, speak a different language.

As a result of these dynamics, small-to-medium sized asset managers have a choice to make: *specialization or extinction.* For those who opt-in for specialization, the path involves understanding the behavior of other market participants as well as their own. Adaptive markets require investment processes and behavior to become adaptive too. Adaptivity of the investment decision maker then requires an active maximization of skills and minimization of luck dependence (and influence) in the investment decision. Thus, a most rational understanding lays the foundation for why and how to adapt.

Behavioral economics and finance have enabled us to better understand the implications of our bounded rationality as capital market participants. The translation of those insights into practical guidance for professional investors has only recently begun. In this article, we introduce one such framework, developed at Panthera Solutions that offers executable principles in the context of asset management from a practitioner's viewpoint.

The Managerial Problem and Its Solution

As the asset management industry grows increasingly competitive, specialization is the key to survival for most investment firms. Finance is first and foremost a social science. By enhancing the rational understanding of the behavior of other market participants as well as their own, professional investors can develop a comparative advantage in their respective specialization efforts. The managerial problem consists of "slow" adoption rates of applicable behavioral insights by professional investors in order to make more rational investment decisions in their search for comparative advantages in adaptive markets (Monk, 2015).

Solution: to support professional investors in their specialization, an effective *interventions and applications toolbox* needs to be explored to facilitate designed changes for empowering professional investors, embedded in a choice architecture that supports their empowerment. This interplay leads to a comparative advantage through adaptive behavior and adaptive investment processes, which then interact with adaptive markets, as depicted in Figure 1.

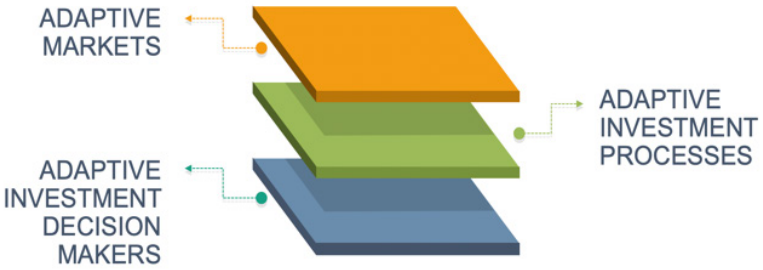

Figure 1: Adaptive markets

Our research and experience have produced a blueprint for effectively directing management changes in the asset management industry. This emergent blueprint consists of a clarified intervention objective, an intervention and application toolbox and an implementation roadmap through which the toolbox is brought to bear. In addition to the conceptional groundwork, parts of the blueprint were empirically tested and validated through action research design. We label the outcome as Intuitive Behavioral Design®.

Academic Context

The Third Asset Allocation Generation

The visualization below summarizes 70 years of modern portfolio theory since Markowitz (1952) in three defined generations of portfolio construction techniques. The first two, single period/single factor models and multi-period/multi-factor models share a set of assumptions that are based on the homo oeconomicus as a concept of man (Schuller, 2015).

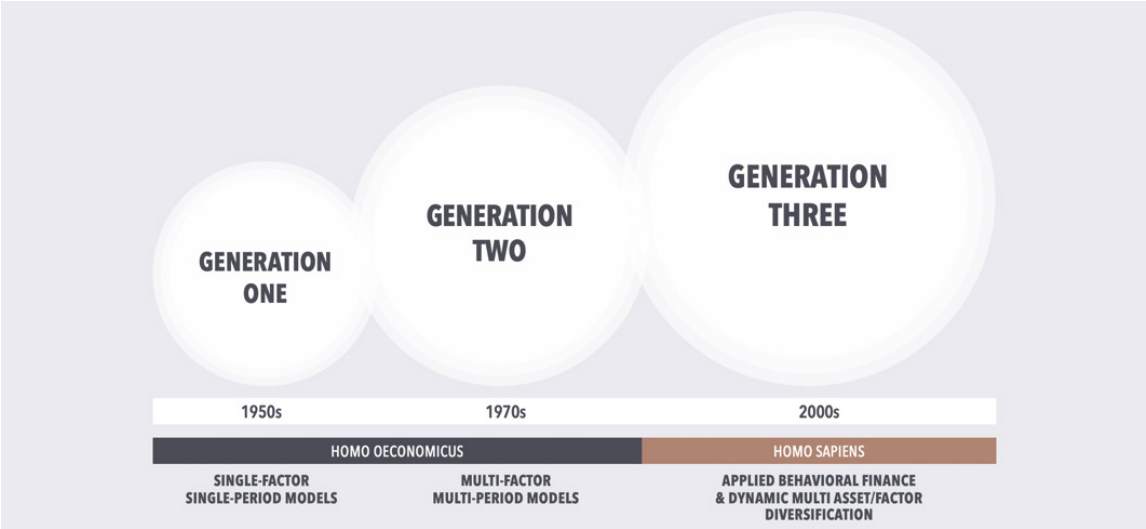

Figure 2: Asset allocation generations. Copyright Panthera Solutions.

Despite significant empirical and experimental evidence against the basic assumptions of the first two generations of models, and in support of the concept of biased human behavior, the disunity of the scientific discourse persists to date. This was highlighted in 2013, when the Prize in Economic Sciences in Memory of Alfred Nobel (the Nobel Prize in Economics) was

awarded to Eugene F. Fama, Lars Peter Hansen, and Robert J. Shiller, representing diametrically opposed schools of thoughts—with Shiller being a prominent researcher on market anomalies, as demonstrated in his book Animal Spirits (Shiller & Akerlof, 2009) or his groundbreaking work with another Nobel Laureate George Akerlof on Sludges in financial services (2015)[1].

Third generation asset allocation models represent emancipation from the basic assumptions of the first two. The homo oeconomicus no longer takes the center of the stage and starting point of modelling. The academic foundations of this alternative line of work was initiated by Benoit Mandelbrot in the 1960s and continued in the 1970s, with researchers (Jensen, 1978; Kahneman & Tversky, 1979; Shiller, 1981; Dimson, 1988) documenting market phenomena which could not be explained by the established theories, but could be understood as being caused by the cognitive biases of market participants. These researchers laid the foundation for subsequent research in detecting and isolating dozens of biases since. In 2004, the third generation of models received its conceptual framework through Andrew Lo´s (2004) combination of cognitive neuroscience and evolution theory postulated as the Adaptive Market Hypothesis (AMH).

Contrary to the first-generation assumptions, including the central notion of Pareto Efficiency, Lo defines market efficiency from an evolutionary perspective, arguing that market participants optimize their satisfaction, while oscillating between greed and fear. AMH-groundwork has been laid by one of the pioneers in behavioral finance, Hersh Shefrin, with the very first behavioral investment book "Beyond Greed and Fear" (Shefrin, 1999). Within the framework AMH provides, behavioral finance research can now focus on applicable insights concerning cognitive aspects of market participants (Lo, 2010).

The AMH assumptions are compatible with a system theoretical/constructivist understanding of nature and highlights the fundamental weakness of the modern capital market theory—assuming market participant as homo oeconomicus, thus rational agents. This weakness can be traced back to intended and/or unintended selective interpretations of Adam Smith by Milton Friedman and other researchers at the Chicago School of Economics.

The Scottish philosopher and father of modern economics, Adam Smith, has described market participants in his two main publications (Smith, 1759, Smith 1776) as civilized persons, willing to sacrifice beyond self-interest and capable of altruism. Morgenstern (1935), Keynes (1936) and Hayek (1952) among others viewed market participants as social beings with limited cognitive capacity, whose market choices arise from social and reflexive interactions. For instance, Hayek (1952) considers the market as a complex social system, whereas the complexity has its origin in the constructivist perception of a brain, which interprets any information subjectively and converts it into heterogeneous expectations. This fundamental relativity of perception has also been a well-known phenomenon in natural sciences, introduced by quantum mechanics during the first half of the 20th century, e.g., see Schrödinger's cat (Schrödinger, 1935).

In short, before the rational agent was established as the dominant formal view of humans during the second half of the 20th century, sciences created sufficient evidence to consider

[1] Sludges are defined as using nudging techniques for less benevolent purposes to a) discourage behavior that is in the person´s best interest and/or b) to encourage self-defeating behavior (Thaler, 2018)

individuals as path-dependent, satisfaction-optimizing actors with bounded rationality. The substitution of the rational agent by a more accurate view of humans as part of the third-generation modeling simply means returning to an already well-established understanding of the concept of man.

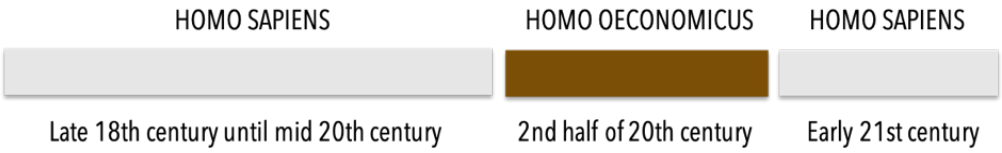

Figure 3: Concept of humankind of a market participant. Copyright Panthera Solutions.

This insight suggests that the analysis of market processes and participants can benefit from an anthropologic-sociological perspective. This framework has influenced the research in behavioral economics and behavioral finance since the 1970s, or more recently, the fields of cognitive neuroscience and complexity research.

Empowering Professional Investors

Most Evidence-Based Investment Decisions (EBID)

The empowerment of a professional investor to structurally increase the likelihood of a most evidence-based investment decision requires a workable definition of rationality.

Drawing on a workable definition from Rapp and Cortes (2016), an investment decision becomes more rational, if (1) the limbic system is stimulated as such to maximize the contribution of the Prefrontal (PFC) and Orbitofrontal Cortex (OFC) to the decision-making process and if (2) PFC+OFC are trained to equip the individual with relevant expert knowledge and related tools to assess the consequences of its use (Roth, 2007). This neuro-scientific definition is multi-disciplinarily supported by the world´s foremost experts on expertise, summarized in the Cambridge Handbook of Expertise and Expert Performance (Ericsson, 2018).

According to the standard model in cognitive neuroscience (Roth, 1994), the thinking process is a full-body exercise, for which the rational element can, but not necessarily has to play a role. The sequence of a thinking process begins and ends with our limbic system, the central evaluation system of our brain, orchestrating our emotions by, for instance, managing our hormonal balance. The rational contribution to a thinking process, according to cognitive neuroscience, is compatible with the dimension of different levels of consciousness, following Freud´s topographic model of the mind, "*which is still the most coherent and intellectually satisfying view of the mind*" (Kandel, 1999). It is further compatible with the system 1 and 2 categorization of the Prospect Theory (Kahneman & Tversky, 1979) and the equally pioneering work of Steven Sloman (Sloman & Barbey, 2007; Sloman & Fernbach, 2017).

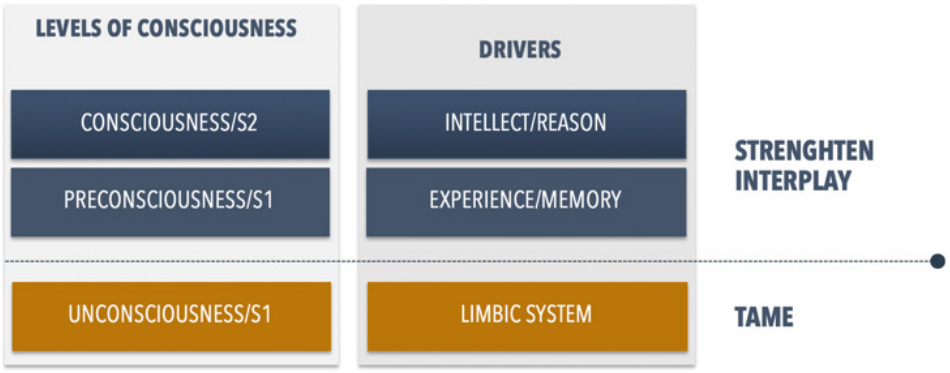

Figure 4: Levels and drivers of consciousness

Figure 4 shows preconsciousness and unconsciousness as thinking processes that Kahneman calls System 1 (S1), namely fast, automatic, frequent, emotional, stereotypic. The consciousness is categorized as System 2 (S2), namely slow, effortful, infrequent, logical, calculating (Kahneman, 2011). S1 is divided into preconsciousness, based on intuition-driven heuristics, and unconsciousness, based on instinct-driven heuristics (Roth, 1999).

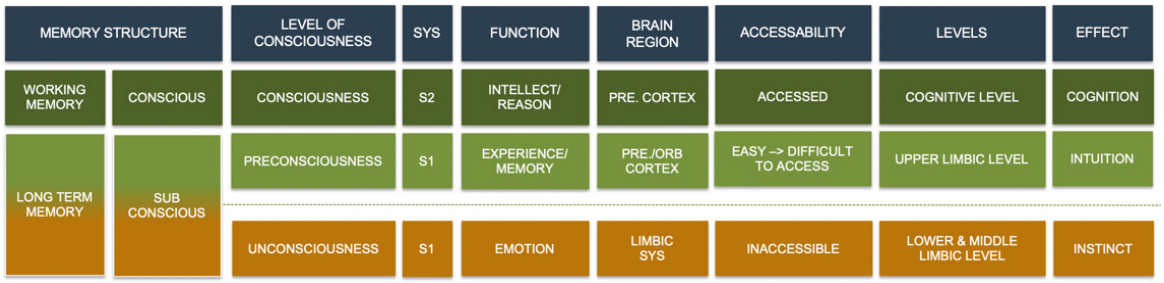

Figure 5: Integration of different cognitive perspectives. Copyright Panthera Solutions.

Likewise, the early Epstein (1973), when formulating his dual-process model, the Cognitive-experiential self-theory (CEST) states *"experiential system, which operates at a preconscious level of information processing (acts) in contrast to a rational system, which operates at a conscious level" (Epstein, 1983).* Although the foundation for an S2 and S1 distinction was laid, it took his school of thought years of additional research to better assess and work in the interplay between consciousness and preconsciousness (Epstein, 1991). "*It is noteworthy that the stage of the dual-process aspects of CEST that was reached in 1991 is considerably more advanced than most modern dual process theories proposed many years later. In fact, the same could even be said of the 1983 article, in which a list of attributes of experiential processing was first introduced*." (Epstein, 2005)

Conclusively, the late Epstein can be considered in line with the initially introduced approach of Roth and Sloman, as he would even claim that the early Sloman "*presents as his own original theory a detailed reproduction of almost all the major assumptions and processing principles and attributes of the experiential and rational systems described in CEST*", only with different labels (Epstein, 2005). All three offer a refined distinction between consciousness (S2), preconsciousness (S1) and unconsciousness (also S1) They also lay the foundation for the integration of three different schools of thoughts in the next section. Figure 5 summarizes the state-of-the-art research on these three levels.

Facilitating Most Evidence-Based Investment Decisions by Integrating 3 Behavioral Schools

A bridge can be built between the three schools of thought in behavioral finance, Fast & Frugal Heuristics, Heuristics & Biases and Naturalistic Decision Making (FFH, H&B and NDM; see Figure 6). Switching from looking at them through the competitive lens of turfs, to an understanding of what their respective insights can do for practitioners, one finds them to be sufficiently overlapping to generate a compatible and complementary foundation.

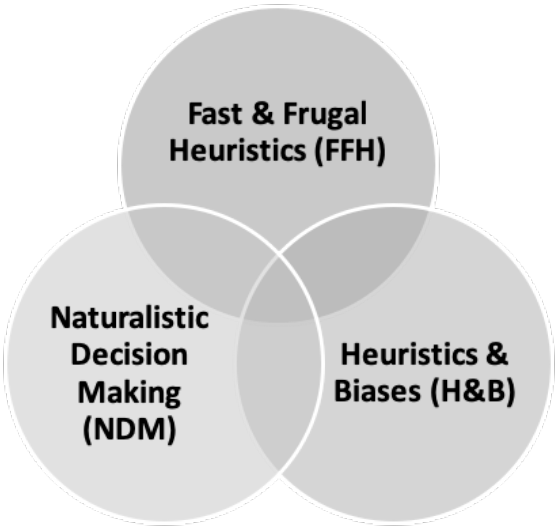

Figure 6: Schools of thought in behavioral finance

The understanding of whether heuristics are a predominantly negative phenomenon for a rational decision in the business domain has changed (Forbes, 2015; Mousavi & Gigerenzer, 2014; Mousavi, Gigerenzer, & Kheirandish 2017). In the early days of behavioral finance research it was believed that a rational decision avoids invoking heuristics altogether (Gilovich et al., 2002). Gerd Gigerenzer and his team have clarified through a series of well-received research articles that in certain contexts, most of us regularly use heuristics simply because they produce better decisions (Gigerenzer & Brighton, 2009; Gigerenzer & Gassmaier, 2011; Gigerenzer & Goldstein, 1996). The consideration of the context, thus turns a heuristic from a phenomenon to be generally avoided to a potentially useful tool. Specific heuristics, namely intuition-based heuristics, can be used for making more rational decisions, in the sense that a successful application of an intuition-based heuristic is governed by its ecological rationality (Gigerenzer, 2015).

A criticism posed by Gigerenzer and his school of thought (FFH – Fast and Frugal Heuristics) to Kahneman and his school of thought (H&B – Heuristics and Biases) is that the latter has ignored the relevance of the context, blaming an individual to act sub-optimally when being trapped in

a heuristics based on cognitive biases, while ignoring the relevance of intuition-based heuristics in the context of uncertainty (Gigerenzer, 2017; Mousavi & Gigerenzer, 2017).

The "Naturalistic Decision Making"-school (NDM) of Gary Klein can be seen as bridge builder between H&B and FFH. Their application-focused approach pragmatically defines intuition as "*based on large numbers of patterns gained through experience, resulting in different forms of tacit knowledge*" (Klein, 2015). Kahneman and Klein compared their schools (Kahneman & Klein, 2009) and concluded that they can agree on distinguishing different classes of intuitions: those that arise from experience and manifest skill (NDM) and those that arise from simplifying heuristics, not from specific experience (H&B). They both endorse the Simon definition of a skilled intuition (Simon, 1992): "*The situation has provided a cue: this cue has given expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition*." They also agree that most intuitive judgments and decisions in S1 are skilled, appropriate and eventually successful, but not all.

Conclusion: "*Skilled intuition will only develop in an environment of sufficient regularity, which provides valid cues to the situation*" (Kahneman & Klein, 2009). The FFH definition of intuition-driven heuristics can be compatibly devised together with the common ground findings of Kahneman and Klein. FFH postulates he*uristics as adaptive tools that ignore information to make fast and frugal decisions that are accurate and robust under conditions of uncertainty. A heuristic is considered ecologically rational when it functionally matches the structure of an environment* (Neth, Meder, Kothiyal, & Gigerenzer 2014; Neth & Gigerenzer 2015; Mousavi & Gigerenzer 2017).

This outcome is in line with a realm of literature in evolutionary psychology that dates back to the 1940 and gained traction since the 1990s (Riggs, 1993): the evolutionary mismatch theory. It refers to evolved traits that were once advantageous but became maladaptive due to changes in the environment. The maladaptive notion was prominently included in the contextual framework Lo (2004) created for the third generation of portfolio optimization techniques, by postulating the adaptive market hypothesis. The evolutionary mismatch theory provides ground for all three described schools in behavioral finance, as it is not only applicable for phylogenetic learning, but also ontogenetic variations (Lloyd, Wilson, & Sober, 2011; Giphart & van Vugt, 2018).

In short, S1 can be distinguished between intuition-driven and instinct-driven heuristics, whereas intuition-driven should be included in most evidence-based investment decisions, given conditions of uncertainty. Intervening in the preconsciousness to shape intuition-driven heuristics can support professional investors in overcoming their resistance to change, thus making their behavior more adaptive.

Including intuition-driven heuristics in our thinking process increases the likelihood of a more rational outcome (Roth, 2007). Whereas including our instinct-driven heuristics as limbic system-based unconsciousness ("gut feeling") should be avoided in our decision making.

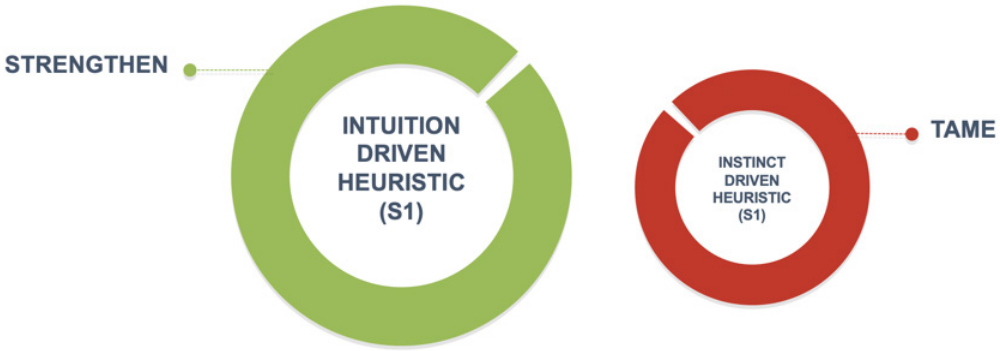

Figure 7: Intuition versus instinct-driven heuristics

Solution

Overcoming the Resistance to Change

Notwithstanding the relevance of most evidence-based investment decisions, a non-trivial phenomenon can be observed: professional investment decision makers tend to talk more about an eventual behavioral impact on their decisions than actually make use of practical behavioral insights in favor of more evidence-based decision making. A phenomenon that was reasoned as follows (Schuller, 2017b):

- Many still consider the rational agent model and corresponding theories and methodologies the state-of-the-art.
- Even those espousing behavioral finance insights use it as a hollow vessel, showcasing their awareness of cognitive biases while not making use of them – a common pretense in Finance.
- Those who work on solutions based on behavioral insights, are rather outward-oriented, trying to sense the thought process of others through sentiment indices or cognitive finance.

All three share the same foundation of resistance: decision makers' difficulty to face their need to adapt their own behavior according to adaptive markets. Change and related challenges are widely researched in the general management literature. For the asset management industry, however, it can be considered an under-researched knowledge frontier (Epstein, 2015).

The complexity of the task to trigger and manifest individual and organizational changes has proven to be non-trivial across fields. Citing the doyens of learning in organizations, Harvard professors Robert Kegan and Lisa Lahey: "*We all know there is a big gulf between insight and the ability to act upon it.*" (Kegan, 2009).

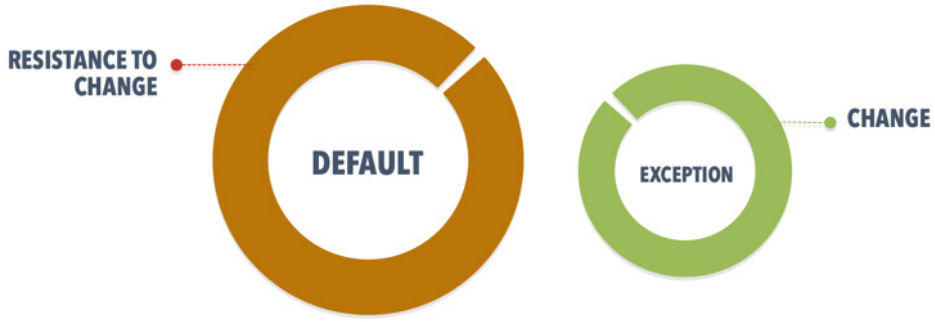

Figure 8: Resistance to change as default setting

Framework for Directed Change

The question arises, how to bring all the above together in a comprehensive framework to understand how to intervene in the choice architecture of a professional investment process that enables empowerment towards most evidence-based decision making. At the same time, the framework needs to be concrete enough to derive from interventions on an individual level, empowering the decision maker to utilize the enabling choice architecture.

The Panthera framework addresses the need to overcome the described resistance to change by constructively closing the knowing-doing gap (Schuller, 2018). In empowering professional investors towards most evidence-based investment decisions, our framework concentrates on two elements:

1. *Establishing focus* to get ready for making most evidence-based decisions (intervention framework)

2. *Applying the established focus* to select the right tools/methods/sources in building the case for most evidence-based decisions (application framework)

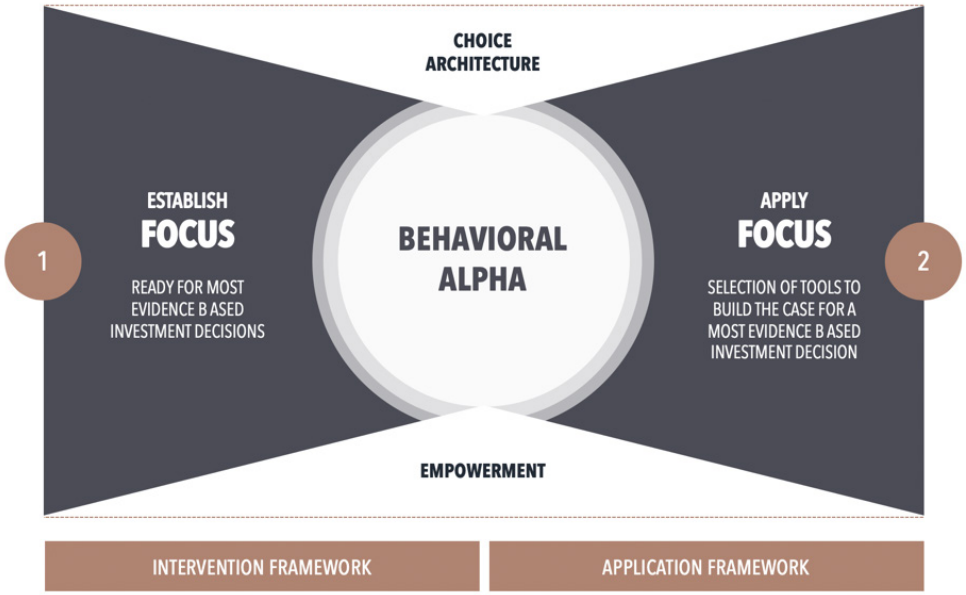

Figure 9: Intervention and application framework. Copyright Panthera Solutions.

Both elements of the framework are driven by the objective to empower individual decision makers, while embedding them in a choice architecture that facilitates their empowerment.

Busy Is the New Stupid – the Choice Architecture as Focus Enabler

Let us further elaborate on the link between an enabling choice architecture along the value chain of an investment process, and an empowered investment decision maker who is embedded in it:

Recent research in applied behavioral finance (Halpern, 2016) concludes that the choice architecture along the investment process is of significant relevance for whether the decision itself is made rationally or emotionally. The facilitation of self-directed neuroplasticity to include intuition-based heuristics in decision making requires being embedded in a supportive choice architecture to make lasting changes. The assumption that people have self-control because they're good at exerting willpower is increasingly falsified. Self-control and all its benefits, may not be related to inhibiting limbic-system impulses at all (Shefrin & Thaler, 1978; Hofmann, 2012; Inzlicht, 2017). Willpower can be rather considered to be a reservoir, not a river. Once deployed to one decision, less self-control remains for the next one (Eisenhardt, 2015). Relying on willpower after its exhaustion results in distraction, which in turn leaves one busy throughout cognitive arousal, instead of remaining focused.

The choice architecture is a combination of cultural and procedural patterns (Thaler & Sunstein, 2008). Awareness of institutional investors regarding the importance of its arrangement is steadily on the rise, supported by growing research in the field (Lo, 2014).

Conclusion

Investors need to accept the characteristics of capital markets: they are complex, adaptive systems with a high level of endogenous dynamic, driven by a large number of heterogeneous

market participants acting under imperfect information and bounded rationality. Investment processes and decision makers need to match this adaptivity.

This article focuses on how people actually take decisions, and how they can be supported in taking better decisions through the introduced intervention and application framework. Our research produced a blueprint for effective directed change management in the asset management industry.

We define "better investment decisions" as most evidence-based ones, which emerge from simultaneous maximization of skills and minimization of reliance on luck for achieving ones investment objectives. Making most evidence-based investment decisions involves creating a fit between analyzed market phenomenon and the analytical tool applied, and supplemented by intuition-based heuristics.

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RESOURCES

Behavioral Science Concepts

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A

Action bias

Some core ideas in behavioral economics focus on people's propensity to do nothing, as evident in **default bias** and **status quo bias**. Inaction may be due to a number of factors, including **inertia** or anticipated **regret**. However, sometimes people have an impulse to act in order to gain a sense of control over a situation and eliminate a problem. This has been termed the action bias (Patt & Zeckhauser, 2000). For example, a person may opt for a medical treatment rather than a no-treatment alternative, even though clinical trials have not supported the treatment's effectiveness.

Action bias is particularly likely to occur if we do something for others or others expect us to act (see **social norm**), as illustrated by the tendency for soccer goal keepers to jump to left or right on penalty kicks, even though statistically they would be better off if they just stayed in the middle of the goal (Bar-Eli et al., 2007). Action bias may also be more likely among **overconfident** individuals or if a person has experienced prior negative outcomes (Zeelenberg et al., 2002), where subsequent inaction would be a failure to do something to improve the situation.

Affect heuristic

The affect heuristic represents a reliance on good or bad feelings experienced in relation to a stimulus. Affect-based evaluations are quick, automatic, and rooted in experiential thought that is activated prior to reflective judgments (see **dual-system theory**) (Slovic et al., 2002). For example, experiential judgments are evident when people are influenced by risks framed in terms of counts (e.g. "of every 100 patients similar to Mr. Jones, 10 are estimated to commit an act of violence") more than an abstract but equivalent probability frame (e.g. "Patients similar to Mr. Jones are estimated to have a 10% chance of committing an act of violence to others") (Slovic et al., 2000).

Affect-based judgments are more pronounced when people do not have the resources or time to reflect. For example, instead of considering risks and benefits independently, individuals with a negative attitude towards nuclear power may consider its benefits as low and risks as high under conditions of time pressure. This leads to a more negative risk-benefit correlation than would be evident without time pressure (Finucane et al., 2000).

The affect heuristic has been used as a possible explanation for a range of consumer judgments, including product innovations (King & Slovic, 2014), brand image (e.g. Ravaja et al., 2015), and product pricing (e.g. the **zero price effect**; see Samson & Voyer, 2012). It is considered another general purpose heuristic similar to **availability heuristic** and **representativeness heuristic** in the sense that affect serves as an orienting mechanism akin to similarity and memorability (Kahneman & Frederick, 2002).

Altruism

According to neoclassical economics, rational beings do whatever they need to in order to maximize their own wealth. However, when people make sacrifices to benefit others without expecting a personal reward, they are thought to behave altruistically (Rushton, 1984). Common applications of this pro-social behavior include volunteering, philanthropy, and helping others in emergencies (Piliavin & Charng, 1990).

Altruism is evident in a number of research findings, such as **dictator games**. In this game, one participant proposes how to split a reward between himself and another random participant. While some proposers (dictators) keep the entire reward for themselves, many will also voluntarily share some portion of the reward (Fehr & Schmidt, 1999).

While altruism focuses on sacrifices made to benefit others, similar concepts explore making sacrifices to ensure **fairness** (see **inequity aversion** and **social preferences**).

Ambiguity (uncertainty) aversion

Ambiguity aversion, or uncertainty aversion, is the tendency to favor the known over the unknown, including known risks over unknown risks. For example, when choosing between two bets, we are more likely to choose the bet for which we know the odds, even if the odds are poor, than the one for which we don't know the odds.

This aversion has gained attention through the Ellsberg Paradox (Ellsberg, 1961). Suppose there are two bags each with a mixture of 100 red and black balls. A decision-maker is asked to draw a ball from one of two bags with the chance to win $100 if red is drawn. In one bag, the decision-maker knows that exactly half of the pieces are red and half are black. The color mixture of pieces in the second bag is unknown. Due to ambiguity aversion, decision-makers would favor drawing from the bag with the known mixture than the one with the unknown mixture (Ellsberg, 1961). This occurs despite the fact that people would, on average, bet on red or black equally if they were presented with just one bag containing either the known 50-50 mixture or a bag with the unknown mixture.

Ambiguity aversion has also been documented in real-life situations. For example, it leads people to avoid participating in the stock market, which has unknown risks (Easley & O'Hara, 2009), and to avoid certain medical treatments when the risks are less known (Berger, et al., 2013).

Anchoring (heuristic)

Anchoring is a particular form of **priming** effect whereby initial exposure to a number serves as a reference point and influences subsequent judgments. The process usually occurs without our awareness (Tversky & Kahneman, 1974) and has been researched in many contexts, including probability estimates, legal judgments, forecasting and purchasing decisions (Furnham & Boo, 2011).

One experiment asked participants to write down the last three digits of their phone number multiplied by one thousand (e.g. 678 = 678,000). Results showed that people's subsequent estimate of house prices were significantly influenced by the arbitrary anchor, even though they were given a 10 minute presentation on facts and figures from the housing market at the

beginning of the study. In practice, anchoring effects are often less arbitrary, as evident the price of the first house shown to us by a real estate agent may serve as an anchor and influence perceptions of houses subsequently presented to us (as relatively cheap or expensive). Anchoring effects have also been shown in the consumer packaged goods category, whereby not only explicit slogans to buy more (e.g. "Buy 18 Snickers bars for your freezer"), but also purchase quantity limits (e.g. "limit of 12 per person") or 'expansion anchors' (e.g. "101 uses!") can increase purchase quantities (Wansink et al., 1998).

Asymmetrically dominated choice

See **Decoy effect**

Availability heuristic

Availability is a heuristic whereby people make judgments about the likelihood of an event based on how easily an example, instance, or case comes to mind. For example, investors may judge the quality of an investment based on information that was recently in the news, ignoring other relevant facts (Tversky & Kahneman, 1974). In the domain of health, it has been shown that drug advertising recall affects the perceived prevalence of illnesses (An, 2008), while physicians' recent experience of a condition increases the likelihood of subsequently diagnosing the condition (Poses & Anthony, 1991). In consumer research, availability can play a role in various estimates, such as store prices (Ofir et al., 2008) or product failure (Folkes, 1988). The availability of information in memory also underlies the **representativeness heuristic**.

B

Behavioral economics

The field of behavioral economics studies and describes economic decision-making. According to its theories, actual human behavior is less rational, stable, and selfish than traditional normative theory suggests (see also ***homo economicus***), due to **bounded rationality**, limited **self-control**, and **social preferences**.

Bias

See **Cognitive bias**

Bounded rationality

Bounded rationality is a concept proposed by Herbert Simon that challenges the notion of human rationality as implied by the concept of ***homo economicus***. Rationality is bounded because there are limits to our thinking capacity, available information, and time (Simon, 1982). Bounded rationality is a core assumption of the "natural assessments" view of **heuristics** and **dual-system models** of thinking (Gilovich et al., 2002), and it is one of the psychological foundations of behavioral economics. (See also **satisficing** and **fast and frugal**.)

(Economic) Bubble

Economic (or asset) bubbles form when prices are driven much higher than their intrinsic value (see also **efficient market hypothesis**). Well-known examples of bubbles include the US Dot-com stock market bubble of the late 1990s and housing bubble of the mid-2000s. According to Robert Shiller (2015), who warned of both of these events, speculative bubbles are fueled by contagious investor enthusiasm (see also **herd behavior**) and stories that justify price increases. Doubts about the real value of investment are overpowered by strong emotions, such as envy and excitement.

Other biases that promote bubbles include **overconfidence**, **anchoring**, and **representativeness**, which lead investors to interpret increasing prices as a trend that will continue, causing them to chase the market (Fisher, 2014). Economic bubbles are usually followed a sudden and sharp decrease in prices, also known as a crash.

C

Certainty/possibility effects

Changes in the probability of gains or losses do not affect people's subjective evaluations in linear terms (see also **prospect theory** and **zero price effect**) (Tversky & Kahneman, 1981). For example, a move from a 50% to a 60% chance of winning a prize has a smaller emotional impact than a move from a 95% chance to a 100% chance (certainty). Conversely, the move from a 0% chance to a 5% possibility of winning a prize is more attractive than a change from 5% to 10%. People over-weight small probabilities, which explains the attractiveness of gambling. Research suggests that problem gamblers' probability perception of losing is not distorted and that their **loss aversion** is not significantly different from other people. However, they are much more risk-taking and strongly overweight small to medium probabilities of winning (Ring et al., 2018).

Choice architecture

This term coined by Thaler and Sunstein (2008) refers to the practice of influencing choice by "organizing the context in which people make decisions" (Thaler et al., 2013, p. 428; see also **nudge**). A frequently mentioned example is how food is displayed in cafeterias, where offering healthy food at the beginning of the line or at eye level can contribute to healthier choices. Choice architecture includes many other behavioral tools that affect decisions, such as **defaults**, **framing**, or **decoy** options.

Choice overload

Also referred to as 'overchoice', the phenomenon of choice overload occurs as a result of too many choices being available to consumers. Overchoice has been associated with unhappiness (Schwartz, 2004), **decision fatigue**, going with the **default** option, as well as choice deferral—avoiding making a decision altogether, such as not buying a product (Iyengar & Lepper, 2000). Many different factors may contribute to perceived choice overload, including

the number of options and attributes, time constraints, decision accountability, alignability and complementarity of options, consumers' preference uncertainty, among other factors (Chernev et al., 2015).

Choice overload can be counteracted by simplifying choice attributes or the number of available options (Johnson et al., 2012). However, some studies on consumer products suggest that, paradoxically, greater choice should be offered in product domains in which people tend to feel ignorant (e.g. wine), whereas less choice should be provided in domains in which people tend to feel knowledgeable (e.g. soft drinks) (Hadar & Sood, 2014).

Cognitive bias

A cognitive bias (e.g. Ariely, 2008) is a systematic (non-random) error in thinking, in the sense that a judgment deviates from what would be considered desirable from the perspective of accepted norms or correct in terms of formal logic. The application of **heuristics** is often associated with cognitive biases. Some biases, such as those arising from **availability** or **representativeness**, are 'cold' in the sense that they do not reflect a person's motivation and are instead the result of errors in information processing. Other cognitive biases, especially those that have a self-serving function (e.g. **overconfidence**), are more motivated. Finally, there are also biases that can be motivated or unmotivated, such as **confirmation bias** (Nickerson, 1998).

As the study of heuristics and biases is a core element of behavioral economics, the psychologist Gerd Gigerenzer has cautioned against the trap of a "bias bias" – the tendency to see biases even when there are none (Gigerenzer, 2018).

Cognitive dissonance

Cognitive dissonance, an important concept in social psychology (Festinger, 1957), refers to the uncomfortable tension that can exist between two simultaneous and conflicting ideas or feelings—often as a person realizes that s/he has engaged in a behavior inconsistent with the type of person s/he would like to be, or be seen publicly to be. According to the theory, people are motivated to reduce this tension by changing their attitudes, beliefs, or actions. For example, smokers may rationalize their behavior by holding 'self-exempting beliefs', such as "The medical evidence that smoking causes cancer is not convincing" or "Many people who smoke all their lives live to a ripe old age, so smoking is not all that bad for you" (Chapman et al., 1993).

Arousing dissonance can be used to achieve behavioral change; one study (Dickerson et al., 1992), for instance, made people mindful of their wasteful water consumption and then made them urge others (publicly **commit**) to take shorter showers. Subjects in this 'hypocrisy condition' subsequently took significantly shorter showers than those who were only reminded that they had wasted water or merely made the public commitment.

Commitment

Commitments (see also **precommitment**) are often used as a tool to counteract people's lack of willpower and to achieve behavior change, such as in the areas of dieting or saving. The greater the cost of breaking a commitment, the more effective it is (Dolan et al., 2010). From the perspective of social psychology, individuals are motivated to maintain a consist-

ent and positive self-image (Cialdini, 2008), and they are likely to keep commitments to avoid reputational damage (if done publicly) and/or **cognitive dissonance** (Festinger, 1957). A field experiment in a hotel, for example, found 25% greater towel reuse among guests who made a commitment to reuse towels at check-in and wore a "Friend of the Earth" lapel pin to signal their commitment during their stay (Baca-Motes et al., 2012). The behavior change technique of 'goal setting' is related to making commitments (Strecher et al., 1995), while **reciprocity** involves an implicit commitment.

Confirmation bias

Confirmation bias (Wason, 1960) occurs when people seek out or evaluate information in a way that fits with their existing thinking and preconceptions. The domain of science, where theories should advance based on both falsifying and supporting evidence, has not been immune to bias, which is often associated with people processing hypotheses in ways that end up confirming them (Oswald & Grosjean, 2004). Similarly, a consumer who likes a particular brand and researches a new purchase may be motivated to seek out customer reviews on the internet that favor that brand. Confirmation bias has also been related to unmotivated processes, including primacy effects and **anchoring**, evident in a reliance on information that is encountered early in a process (Nickerson, 1998).

Control premium

In behavioral economics, the control premium refers to people's willingness to forego potential rewards in order to control (avoid delegation) of their own payoffs. In an experiment, participants were asked to choose whether to bet on another person or themselves answering a quiz question correctly. Although individuals' maximizing their rewards would bet on themselves in 56% of the decisions (based on their beliefs), they actually bet on themselves 65% of the time, suggesting an aggregate control premium of almost 10%. The average study participant was willing to sacrifice between 8 and 15% of expected earnings to retain control (Owens et al., 2014). (See also **overconfidence**.)

Curse of knowledge

Economists commonly assume that having more information allows us to make better decisions. However, the information asymmetry that exists when one economic agent has more information than another can also have negative effects for the better-informed agent. This is known as the curse of knowledge (Camerer et al., 1989), which occurs because better-informed agents are unable to ignore their own knowledge.

The curse of knowledge can manifest itself in many domains of economic life, such as setting prices or estimating productivity. With respect to the latter, one study found that experts consistently underestimate the amount of time required by novices to perform a task (Hinds, 1999).

A fun way to show the curse of knowledge in action is through a musical game in which participants are either the "tapper" or a "listener." In the game, the tapper selects a simple, well-known song, such a "Happy Birthday," and taps out the rhythm on a table. The listeners then try to guess the song. In an early experiment, tappers expected the listeners to correctly guess

the song 50% of the time, yet, in reality, listeners were only correct 2.5% of the time (Newton, 1990).

D

Decision fatigue

There are psychological costs to making decisions. Since choosing can be difficult and requires effort, just like any other activity, long sessions of decision making can lead to poor choices. Similar to other activities that consume resources required for executive functions, decision fatigue is reflected in self-regulation, such as a diminished ability to exercise self-control (Vohs et al., 2008). (See also **choice overload** and **ego depletion**.)

Decision staging

When people make complex or long decisions, such as buying a car, they tend to explore their options successively. This involves deciding what information to focus on, as well as choices between attributes and alternatives. For example, when people narrow down their options, they often tend to screen alternatives on the basis of a subset of attributes, and then they compare alternatives. **Choice architects** may not only break down complex decisions into multiple stages, to make the process easier, but they can also work with an understanding of sequential decision making by facilitating certain comparisons at different stages of the choice process (Johnson et al., 2012).

Decoy effect

Choices often occur relative to what is on offer rather than based on absolute **preferences**. The decoy effect is technically known as an 'asymmetrically dominated choice' and occurs when people's preference for one option over another changes as a result of adding a third (similar but less attractive) option. For example, people are more likely to choose an elegant pen over $6 in cash if there is a third option in the form of a less elegant pen (Bateman et al., 2008). While this effect has been extensively studied in relation to consumer products, it has also been found in employee selection (e.g. Slaughter et al., 2006), apartment choices (Simonson, 1989), or as a nudge to increase hand hygiene (Li et al., 2018).

Default (option)

Default options are pre-set courses of action that take effect if nothing is specified by the decision maker (Thaler & Sunstein, 2008), and setting defaults is an effective **nudge** when there is **inertia** or uncertainty in decision making (Samson, 2014). Since defaults do not require any effort by the decision maker, defaults can be a simple but powerful tool when there is inaction (Samson & Ramani, 2018). When choices are difficult, defaults may also be perceived as a recommended course of action (McKenzie et al., 2006). Requiring people to opt out if they do not wish to donate their organs, for example, has been associated with higher donation rates (Johnson & Goldstein, 2003). Similarly, making contributions to retirement savings accounts has become automatic in some countries, such as the United Kingdom and the United States.

Delusion of competence (Dunning-Kruger effect)

This is the case whereby, either socially or pathologically, a person lacks reflexive acknowledgement that they are not equipped to make a decision or to act appropriately in relation to the demands of a situation. Kruger and Dunning (1999) observed a divergence between perceived and actual competence which explains a range of unsound decision-making. The effect explains why, among other real-world difficulties, management boards decide to promote products whose working they don't understand, and why talent show contestants are unaware of their inability to sing, until ejected by the judges. (The prevalence of this bias has made the producers of certain talent shows very wealthy.)

Dictator game

The dictator game is an experimental game (see **behavioral game theory**) designed to elicit **altruistic** aspects of behavior. In the **ultimatum game**, a proposing player is endowed with a sum of money and asked to split it with another (responding) player. The responder may either accept the proposer's offer or reject it, in which case neither of the players will receive anything. Since expressed preferences in the ultimatum game may be due to factors other than altruism (e.g. fear of envy), the dictator game is played without the responder being able to decide whether to accept the offer or not (Camerer, 2003). As a result, it only involves one actual player and is not strictly a game. Whether or not these games really better measure altruism, or something else, forms part of an interesting debate (e.g. Bardsley, 2008) (See also **trust game**.)

Discounting

See **Time discounting**

Disposition effect

The disposition effect refers to investors' reluctance to sell assets that have lost value and greater likelihood of selling assets that have made gains (Shefrin & Statman, 1985). This phenomenon can be explained by **prospect theory** (**loss aversion**), **regret avoidance** and **mental accounting**.

Diversification bias

People seek more variety when they choose multiple items for future consumption simultaneously than when they make choices sequentially, i.e. on an 'in the moment' basis. Diversification is non-optimal when people overestimate their need for diversity (Read & Loewenstein, 1995). In other words, sequential choices lead to greater experienced **utility**. For example, before going on vacation I may upload classical, rock and pop music to my MP3 player, but on the actual trip I may mostly end up listening to my favorite rock music. When people make simultaneous choices among things that can be classified as virtues (e.g. high-brow movies or healthy deserts) or vices (e.g. low-brow movies or hedonic deserts), their diversification strategy usually involves a greater selection of virtues (Read et al., 1999). (See also **projection bias**.)

Dual-self model

In economics, dual-self models deal with the inconsistency between the patient long-run self and myopic short-run self. With respect to savings behavior, Thaler and Shefrin (1981) introduced the concepts of the farsighted planner and myopic doer. At any point in time, there is a conflict between those selves with two sets of **preferences**. The approach helps economic theorists overcome the paradox created by self-control in standard views of **utility**. The more recent dual-self model of impulse control (Fudenberg & Levine, 2006) explains findings from the areas of time discounting, risk aversion, and self-control (see also **intertemporal choice**). More practically-oriented research on savings behavior has attempted to make people feel more connected to their future selves, making them appreciate that they are the future recipients of current savings. In an experiment, participants who were exposed to their future (as opposed to present) self in the form of an age-progressed avatar in virtual reality environments allocated twice as much money to a retirement account (Hershfield et al., 2011).

Dual-system theory

Dual-system models of the human mind contrast automatic, fast, and non-conscious (System 1) with controlled, slow, and conscious (System 2) thinking (see Strack & Deutsch, 2015, for an extensive review). Many **heuristics** and **cognitive biases** studied by behavioral economists are the result of intuitions, impressions, or automatic thoughts generated by System 1 (Kahneman, 2011). Factors that make System 1's processes more dominant in decision making include cognitive busyness, distraction, time pressure, and positive mood, while System 2's processes tend to be enhanced when the decision involves an important object, has heightened personal relevance, and when the decision maker is held accountable by others (Samson & Voyer, 2012; Samson & Voyer, 2014).

E

Efficient market hypothesis

According to the efficient market hypothesis, the price (market value) of a security reflects its true worth (intrinsic value). In a market with perfectly rational agents, "prices are right". Findings in behavioral finance, by contrast, suggests that asset prices also reflect the trading behavior of individuals who are not fully rational (Barberis & Thaler, 2003), leading to anomalies such as asset **bubbles**.

Ego depletion

Ego depletion is a concept emanating from self-regulation (or self-control) theory in psychology. According to the theory, willpower operates like a muscle that can be exercised or exerted. Studies have found that tasks requiring self-control can weaken this muscle, leading to ego depletion and a subsequently diminished ability to exercise self-control. In the lab, ego depletion has been induced in many different ways, such as having to suppress emotions or thoughts, or having to make a range of difficult decisions. The resulting ego depletion leads people to make less restrained decisions; consumers, for example, may be more likely to choose candy

over 'healthy' granola bars (Baumeister et al., 2008). Some studies now suggest that the evidence for this resource depletion model of self-control has been overestimated (e.g. Hagger & Chatzisarantis, 2016).

Elimination-by-aspects

Decision makers have a variety of **heuristics** at their disposal when they make choices. One of these effort-reducing heuristics is referred to as 'elimination-by-aspects'. When it is applied, decision makers gradually reduce the number of alternatives in a choice set, starting with the aspect that they see as most significant. One cue is evaluated at a time until fewer and fewer alternatives remain in the set of available options (Tversky, 1972). For example, a traveler may first compare a selection of hotels at a target destination on the basis of classification, eliminating all hotels with fewer than three stars. The person may then reduce the choice set further by walking distance from the beach, followed by guest reviews, etc., until only one option remains.

(Hot-cold) Empathy gap

It is difficult for humans to predict how they will behave in the future. A hot-cold empathy gap occurs when people underestimate the influence of visceral states (e.g. being angry, in pain, or hungry) on their behavior or preferences (Loewenstein, 2005). In medical decision making, for example, a hot-to-cold empathy gap may lead to undesirable treatment choices when cancer patients are asked to choose between treatment options right after being told about their diagnosis.

In a study on the reverse, a cold-to-hot empathy gap, smokers were assigned to different experimental conditions (Sayette et al., 2008). Some smokers in a hot (craving) state were asked to make predictions about a high-craving state in a second session. Others made the same prediction while they were in a cold state. In contrast to those in the hot group, smokers in the cold group underpredicted how much they would value smoking during the second session. This empathy gap can explain poor decisions among smokers attempting to quit that place them in high-risk situations (e.g. socializing over a drink) and why people underestimate their risk of becoming addicted in the first place.

Endowment effect

This bias occurs when we overvalue a good that we own, regardless of its objective market value (Kahneman et al., 1991). It is evident when people become relatively reluctant to part with a good they own for its cash equivalent, or if the amount that people are **willing to pay** for the good is lower than what they are **willing to accept** when selling the good. Put more simply, people place a greater value on things once they have established ownership. This is especially true for goods that wouldn't normally be bought or sold on the market, usually items with symbolic, experiential, or emotional significance. Endowment effect research has been conducted with goods ranging from coffee mugs (Kahneman et al., 1990) to sports cards (List, 2011). While researchers have proposed different reasons for the effect, it may be best explained by psychological factors related to **loss aversion** (Ericson & Fuster, 2014).

Extrapolation bias

See **Representativeness heuristic**

F

Fairness

In behavioral science, fairness refers to our **social preference** for equitable outcomes. This can present itself as **inequity aversion**, people's tendency to dislike unequal payoffs in their own or someone else's favor. This tendency has been documented through experimental games, such as the **ultimatum**, **dictator**, and **trust games** (Fehr & Schmidt, 1999).

A large part of fairness research in economics has focused on prices and wages. With respect to prices, for example, consumers are generally less accepting of price increases as result of a short term growth in demand than rise in costs (Kahneman et al., 1986). With respect to wages, employers often agree to pay more than the minimum the employees would accept in the hope that this fairness will be **reciprocated** (e.g. Jolls, 2002). On the flip side, perceived unfairness, such as excessive CEO compensation, has been behaviorally associated with reduced work morale among employees (Cornelissen et al., 2011).

Fast and frugal

Fast and frugal decision-making refers to the application of ecologically rational **heuristics**, such as the **recognition heuristic**, which are rooted in the psychological capacities that we have evolved as human animals (e.g. memory and perceptual systems). They are 'fast and frugal' because they are effective under conditions of **bounded rationality**—when knowledge, time, and computational power are limited (Goldstein & Gigerenzer, 2002).

Fear of missing out

Social media has enabled us to connect and interact with others, but the number of options offered to us through these channels is far greater than what we can realistically take up, due to limited time and practical constraints. The popular concept of FoMO, or Fear of Missing Out, refers to "a pervasive apprehension that others might be having rewarding experiences from which one is absent" (Przybylski et al., 2013). People suffering from FoMO have a strong desire to stay continually informed about what others are doing (see also **scarcity heuristic**, **regret aversion**, and **loss aversion**).

Framing effect

Choices can be presented in a way that highlights the positive or negative aspects of the same decision, leading to changes in their relative attractiveness. This technique was part of Tversky and Kahneman's development of **prospect theory**, which framed gambles in terms of losses or gains (Kahneman & Tversky, 1979a). Different types of framing approaches have been identified, including risky choice framing (e.g. the risk of losing 10 out of 100 lives vs. the op-

portunity to save 90 out of 100 lives), attribute framing (e.g. beef that is described as 95% lean vs. 5% fat), and goal framing (e.g. motivating people by offering a $5 reward vs. imposing a $5 penalty) (Levin et al., 1998).

The concept of framing also has a long history in political communication, where it refers to the informational emphasis a communicator chooses to place in a particular message. In this domain, research has considered how framing affects public opinions of political candidates, policies, or broader issues (Busby et al., 2018).

G

Gambler's fallacy

The term 'gambler's fallacy' refers to the mistaken belief held by some people that independent events are interrelated; for example, a roulette or lottery player may choose not to bet on a number that came up in the previous round. Even though people are usually aware that successive draws of numbers are unrelated, their gut feeling may tell them otherwise (Rogers, 1998).

(Behavioral) Game theory

Game theory is a mathematical approach to modeling behavior by analyzing the strategic decisions made by interacting players (Nash, 1950). In standard experimental economics, the theory assumes ***homo economicus*** – a self-interested, rational maximizer. Behavioral game theory extends standard (analytical) game theory by taking into account how players feel about the payoffs other players receive, limits in strategic thinking, the influence of context, as well as the effects of learning (Camerer, 2003). Games are usually about cooperation or **fairness**. Well-known examples include the **ultimatum game**, **dictator game** and **trust game**.

H

Habit

Habit is an automatic and rigid pattern of behavior in specific situations, which is usually acquired through repetition and develops through associative learning (see also System 1 in **dual-system theory**), when actions become paired repeatedly with a context or an event (Dolan et al., 2010). 'Habit loops' involve a cue that triggers an action, the actual behavior, and a reward. For example, habitual drinkers may come home after work (the cue), drink a beer (the behavior), and feel relaxed (the reward) (Duhigg, 2012). Behaviors may initially serve to attain a particular goal, but once the action is automatic and habitual, the goal loses its importance. For example, popcorn may habitually be eaten in the cinema despite the fact that it is stale (Wood & Neal, 2009). Habits can also be associated with **status quo bias**.

Halo effect

This concept has been developed in social psychology and refers to the finding that a global evaluation of a person sometimes influences people's perception of that person's other unrelated attributes. For example, a friendly person may be considered to have a nice physical appearance, whereas a cold person may be evaluated as less appealing (Nisbett & Wilson, 1977). Halo effects have also been applied in other domains of psychology. For example, a study on the 'health halo' found that consumers tend to choose drinks, side dishes and desserts with higher calorific content at fast‐food restaurants that claim to be healthy (e.g. Subway) compared to others (e.g. McDonald's) (Chandon & Wansink, 2007).

Hedonic adaptation

People get used to changes in life experiences, a process which is referred to as 'hedonic adaptation' or the 'hedonic treadmill'. Just as the happiness that comes with the ownership of a new gadget or salary raise will wane over time, even the negative effect of life events such as bereavement or disability on subjective wellbeing tends to level off, to some extent (Frederick & Loewenstein, 1999). When this happens, people return to a relatively stable baseline of happiness. It has been suggested that the repetition of smaller positive experiences ('hedonic boosts'), such as exercise or religious practices, has a more lasting effect on our wellbeing than major life events (Mochon et al., 2008).

Herd behavior

This effect is evident when people do what others are doing instead of using their own information or making independent decisions. The idea of herding has a long history in philosophy and crowd psychology. It is particularly relevant in the domain of finance, where it has been discussed in relation to the collective irrationality of investors, including stock market **bubbles** (Banerjee, 1992). In other areas of decision-making, such as politics, science, and popular culture, herd behavior is sometimes referred to as 'information cascades' (Bikhchandi et al., 1992). Herding behavior can be increased by various factors, such as fear (e.g. Economou et al., 2018), uncertainty (e.g. Lin, 2018), or a shared identity of decision makers (e.g. Berger et al., 2018).

Heuristic

Heuristics are commonly defined as cognitive shortcuts or rules of thumb that simplify decisions, especially under conditions of uncertainty. They represent a process of substituting a difficult question with an easier one (Kahneman, 2003). Heuristics can also lead to **cognitive biases**. There are disagreements regarding heuristics with respect to bias and rationality. In the **fast and frugal** view, the application of heuristics (e.g. the **recognition heuristic**) is an "ecologically rational" strategy that makes best use of the limited information available to individuals (Goldstein & Gigerenzer, 2002).

There are generally different classes of heuristics, depending on their scope. Some heuristics, such as **affect**, **availability** and **representativeness** have a general purpose character; others developed in social and consumer psychology are more domain-specific, examples of which include brand name, price, and **scarcity** heuristics (Shah & Oppenheimer, 2008).

Hindsight bias

This bias, also referred to as the 'knew-it-all-along effect', is a frequently encountered judgment bias that is partly rooted in **availability** and **representativeness** heuristics. It happens when being given new information changes our recollection from an original thought to something different (Mazzoni & Vannucci, 2007). This bias can lead to distorted judgments about the probability of an event's occurrence, because the outcome of an event is perceived as if it had been predictable. It may also lead to distorted memory for judgments of factual knowledge. Hindsight bias can be a problem in legal decision-making. In medical malpractice suits, for example, jurors' hindsight bias tends to increase with the severity of the outcome (e.g. injury or death) (Harley, 2007).

Homo economicus

The term *homo economicus*, or 'economic man', denotes a view of humans in the social sciences, particularly economics, as self-interested agents who seek optimal, utility-maximizing outcomes. Behavioral economists and most psychologists, sociologists, and anthropologists are critical of the concept. People are not always self-interested (see **social preferences**), nor are they mainly concerned about maximizing benefits and minimizing costs. We often make decisions under uncertainty with insufficient knowledge, feedback, and processing capability (**bounded rationality**); we sometimes lack **self-control**; and our preferences change, often in response to changes in decision contexts.

Honesty

Honesty is an important part of our everyday life. In both business and our private lives, relationships are made and broken based on our **trust** in the other party's honesty and **reciprocity**.

A 2016 study investigated honesty, beliefs about honesty and economic growth in 15 countries and revealed large cross-national differences. Results showed that average honesty was positively associated with GDP per capita, suggesting a relationship between honesty and economic development. However, expectations about countries' levels of honesty were not correlated with reality (the actual honesty in reporting the results of a coin flip experiment), but rather driven by **cognitive biases** (Hugh-Jones, 2016).

People typically value honesty, tend to have strong beliefs in their morality and want to maintain this aspect of their self-concept (Mazar et al., 2008). Self-interest may conflict with people's honesty as an internalized **social norm**, but the resulting **cognitive dissonance** can be overcome by engaging in self-deception, creating moral "wiggle room" that enables people to act in a self-serving manner. When moral reminders are used, however, this self-deception can be reduced, as demonstrated in laboratory experiments conducted by Mazar and colleagues (2008). It is not surprising, then, that a lack of social norms is a general driver of dishonest behavior, along with high benefits and low costs of external deception, a lack of self-awareness, as well as self-deception (Mazar & Ariely, 2006).

Honesty must also be understood in the context of group membership. Employees of a large international bank, for example, behaved honestly on average in an experiment's control condition, but when their professional identity as bankers was rendered salient, a significant

proportion of them became dishonest. This suggests that the prevailing business culture in the banking industry weakens and undermines the honesty norm (Cohn et al., 2014) (see also **identity economics**).

Hot and cold states

See **Empathy gap**

Hyperbolic discounting

See **Time discounting**

Identity economics

Identity economics describes the idea that we make economic choices based on monetary **incentives** and our identity. A person's sense of self or identity affects economic outcomes. This was outlined in Akerlof and Kranton's (2000) seminal paper which expanded the standard utility function to include pecuniary payoffs and identity economics in a simple **game-theoretic** model of behavior, further integrating psychology and sociology into economic thinking.

When economic (or other extrinsic) incentives are ineffective in organizations, identity may be the answer: A worker's self-image as jobholder and her ideal as to how his job should be done, can be a major incentive in itself (Akerlof & Kranton, 2005). Organizational identification was found to be directly related to employee performance and even indirectly related with customer evaluations and store performance in a study on 306 retail stores, for example (Lichtenstein et al., 2010). Also, when employees were encouraged to create their own job titles such that they better reflected the unique value they bring to the job, identification increased, and emotional exhaustion was reduced (Grant et al., 2014). In some cases, identity can also have negative implications. Bankers whose professional identity was made salient, for example, displayed more dishonest behavior (see **honesty**).

IKEA effect

While the **endowment effect** suggests that mere ownership of a product increases its value to individuals, the IKEA effect is evident when invested labor leads to inflated product valuation (Norton et al., 2012). For example, experiments show that the monetary value assigned to the amateur creations of self-made goods is on a par with the value assigned to expert creations. Both experienced and novice do-it-yourselfers are susceptible to the IKEA effect. Research also demonstrates that the effect is not simply due to the amount of time spent on the creations, as dismantling a previously built product will make the effect disappear.

The IKEA effect is particularly relevant today, given the shift from mass production to increasing customization and co-production of value. The effect has a range of possible explanations, such as positive feelings (including feelings of competence) that come with the successful completion of a task, a focus on the product's positive attributes, and the relationship between

effort and liking (Norton et al., 2012), a link between our creations and our self-concept (Marsh et al., 2018), as well as a psychological sense of ownership (Sarstedt et al., 2017. The effort heuristic is another concept that proposes a link between perceived effort and valuation (Kruger et al., 2004).

Incentives

An incentive is something that motivates an individual to perform an action. It is therefore essential to the study of any economic activity. Incentives, whether they are intrinsic or extrinsic (traditional), can be effective in encouraging behavior change, such as ceasing to smoke, doing more exercise, complying with tax laws or increasing public good contributions. Traditional incentives can effectively encourage behavior change, as they can help to both create desirable and break undesirable **habits**. Providing upfront incentives can help the problem of **present bias** – people's focus on immediate gratification. Finally, incentives can help people overcome barriers to behavior change (Gneezy et al., 2019).

Traditionally, the importance of intrinsic incentives was underestimated, and the focus was put on monetary ones. Monetary incentives may backfire and reduce the performance of agents or their compliance with rules (see also **over-justification effect**), especially when motives such as the desire to **reciprocate** or the desire to avoid social disapproval (see **social norms**) are neglected. These intrinsic motives often help to understand changes in behavior (Fehr & Falk, 2002).

In the context of prosocial behavior, extrinsic incentives may spoil the reputational value of good deeds, as people may be perceived to have performed the task for the incentives rather than for themselves (Bénabou & Tirole, 2006). Similarly, performance incentives offered by an informed principal (manager, teacher or parent) can adversely impact an agent's (worker, student or child) perception of a task or of his own abilities, serving as only weak reinforcers in the short run and negative reinforcers in the long run (Bénabou & Tirole, 2003). (For an interesting summary of when extrinsic incentives work and when they don't in nonemployment contexts, see Gneezy et al., 2011).

Inequity aversion

Human resistance to "unfair" outcomes is known as 'inequity aversion', which occurs when people prefer **fairness** and resist inequalities (Fehr & Schmidt, 1999). In some instances, inequity aversion is disadvantageous, as people are willing to forego a gain in order to prevent another person from receiving a superior reward. Inequity aversion has been studied through **experimental games**, particularly **dictator**, **ultimatum**, and **trust games**. The concept has been applied in various domains, including business and marketing, such as research on customer responses to exclusive price promotions (Barone & Tirthankar, 2010) and "pay what you want" pricing (e.g. Regner, 2015).

Inertia

In behavioral economics, inertia is the endurance of a stable state associated with inaction and the concept of **status quo bias** (Madrian & Shea 2001). Behavioral **nudges** can either work *with* people's decision inertia (e.g. by setting **defaults**) or *against* it (e.g. by giving warnings)

(Jung, 2019). In social psychology the term is sometimes also used in relation to persistence in (or **commitments** to) attitudes and relationships.

Information avoidance

Information avoidance in behavioral economics (Golman et al., 2017) refers to situations in which people choose not to obtain knowledge that is freely available. Active information avoidance includes physical avoidance, inattention, the biased interpretation of information (see also **confirmation bias**) and even some forms of forgetting. In behavioral finance, for example, research has shown that investors are less likely to check their portfolio online when the stock market is down than when it is up, which has been termed the ostrich effect (Karlsson et al., 2009). More serious cases of avoidance happen when people fail to return to clinics to get medical test results, for instance (Sullivan et al., 2004).

While information avoidance is sometimes strategic, it usually has immediate hedonic benefits for people if it prevents the negative (usually psychological) consequences of knowing the information. It usually carries negative utility in the long term, because it deprives people of potentially useful information for decision making and feedback for future behavior. Furthermore, information avoidance can contribute to a polarization of political opinions and media bias.

Intertemporal choice

Intertemporal choice is a field of research concerned with the relative value people assign to payoffs at different points in time. It generally finds that people are biased towards the present (see **present bias**) and tend to discount the future (see **time discounting** and **dual-self model**).

L

Less-is-better effect

When objects are evaluated separately rather than jointly, decision makers focus less on attributes that are important and are influenced more by attributes that are easy to evaluate. The less-is-better effect suggests a preference reversal when objects are considered together instead of separately. One study presented participants with two dinner set options. Option A included 40 pieces, nine of which were broken. Option B included 24 pieces, all of which were intact. Option A was superior, as it included 31 intact pieces, but when evaluated separately, individuals were willing to pay a higher price for set B. In a joint evaluation of both options, on the other hand, Option A resulted in higher willingness to pay (Hsee, 1998).

Licensing effect

Also known as 'self-licensing' or 'moral licensing', the licensing effect is evident when people allow themselves to do something bad (e.g. immoral) after doing something good (e.g. moral) first (Merritt et al., 2010). The effect of licencing has been studied for different behavioral

outcomes, including donations, cooperation, racial discrimination, and cheating (Blanken et al., 2015). Well-publicized research in Canada asked participants to shop either in a green or a conventional online store. In one experiment, people who shopped in a green store shared less money in a **dictator game**. Another experiment allowed participants to lie (about their performance on a task) and cheat (take more money out of an envelope than they actually earned) and showed more **dishonesty** among green shoppers (Mazar & Zhong, 2010).

Loss aversion

Loss aversion is an important concept associated with **prospect theory** and is encapsulated in the expression "losses loom larger than gains" (Kahneman & Tversky, 1979a). It is thought that the pain of losing is psychologically about twice as powerful as the pleasure of gaining. People are more willing to take risks (or behave **dishonestly**, e.g. Schindler & Pfattheicher, 2016) to avoid a loss than to make a gain. Loss aversion has been used to explain the **endowment effect** and **sunk cost fallacy**, and it may also play a role in the **status quo bias**.

The basic principle of loss aversion can explain why penalty **frames** are sometimes more effective than reward frames in motivating people (Gächter et al., 2009) and has been applied in behavior change strategies. The website Stickk, for example, allows people to publicly **commit** to a positive behavior change (e.g. give up junk food), which may be coupled with the fear of loss—a cash penalty in the case of non-compliance. (See also **myopic loss aversion** and **regret aversion.**)

People's cultural background may influence the extent to which they are averse to losses (e.g. Wang et al., 2017)

M

Mental accounting

Mental accounting is a concept associated with the work of Richard Thaler (see Thaler, 2015, for a summary). According to Thaler, people think of value in relative rather than absolute terms. For example, they derive pleasure not just from an object's value, but also the quality of the deal—its transaction **utility** (Thaler, 1985). In addition, humans often fail to fully consider opportunity costs (tradeoffs) and are susceptible to the **sunk cost fallacy**.

Why are people willing to spend more when they pay with a credit card than cash (Prelec & Simester, 2001)? Why would more individuals spend $10 on a theater ticket if they had just lost a $10 bill than if they had to replace a lost ticket worth $10 (Kahneman & Tversky, 1984)? Why are people more likely to spend a small inheritance and invest a large one (Thaler, 1985)?

According to the theory of mental accounting, people treat money differently, depending on factors such as the money's origin and intended use, rather than thinking of it in terms of the "bottom line" as in formal accounting (Thaler, 1999). An important term underlying the theory is fungibility, the fact that all money is interchangable and has no labels. In mental accounting, people treat assets as less fungible than they really are. Even seasoned investors are susceptible to this bias when they view recent gains as disposable "house money" (Thaler & Johnson,

1990) that can be used in high-risk investments. In doing so, they make decisions on each mental account separately, losing out the big picture of the portfolio. (See also **partitioning** and **pain of paying** for ideas related to mental accounting.)

Consumers' tendency to work with mental accounts is reflected in various domains of applied behavioral science, especially in the financial services industry. Examples include banks offering multiple accounts with savings goal labels, which make mental accounting more explicit, as well as third-party services that provide consumers with aggregate financial information across different financial institutions (Zhang & Sussman, 2018).

Mindless eating

Various cues non-consciously affect the amount and quality of people's consumption of food. Cues often serve as benchmarks in the environment, and they may include serving containers, packaging, people, labels, and atmospheric factors. They suggest to the consumer what and how much is normal, appropriate, typical, or reasonable to consume. Perceptual biases contribute to a distorted sense of consumption; for example, people underestimate calories in larger servings and tend to serve themselves more when using larger utensils, plates, or bowls (Wansink et al., 2009).

Brian Wansink, the most prominent academic in behavioral food science, has faced allegations of scientific misconduct and several article retractions (Ducharme, 2018).

Money illusion

The term 'money illusion' has been coined by Irving Fisher (1928) and refers to people's tendency to think of monetary values in nominal rather than real terms. This usually occurs when we neglect to consider money's decrease in purchasing power as a result of inflation. Investors, for example, may focus on more salient nominal returns rather than real returns that also account for inflation (Shafir et al., 1997).

Myopic loss aversion

Myopic **loss aversion** occurs when investors take a view of their investments that is strongly focused on the short term, leading them to react too negatively to recent losses, which may be at the expense of long-term benefits (Thaler et al., 1997). This phenomenon is influenced by narrow framing, which is the result of investors considering specific investments (e.g. an individual stock or a trade) without taking into account the bigger picture (e.g. a portfolio as a whole or a sequence of trades over time) (Kahneman & Lovallo, 1993). A large-scale field experiment has shown that individuals who receive information about investment performance too frequently tend to underinvest in riskier assets, losing out on the potential for better long-term gains (Larson et al., 2016).

N

Naive allocation

Decision researchers have found that people prefer to spread limited resources evenly across a set of possibilities (see also **1/N heuristic**). This can be referred to as 'naive allocation'. For example, consumers may invest equal amounts of money across different investment options regardless of their quality. Similarly, the **diversification bias** shows that consumers like to spread out consumption choices across a variety of goods. Research suggests that **choice architects** can work with these tendencies due to decision makers' partition dependence. For instance, by separating healthy food menu options into different menu categories (e.g. 'fruits', 'vegetables') and combining unhealthy options into one single menu category (e.g. 'candies and cookies'), one can steer consumers toward choosing more healthy options and fewer unhealthy options (Johnson et al., 2012).

Nudge

According to Thaler and Sunstein (2008, p. 6), a nudge is

> any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic **incentives**. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting the fruit at eye level counts as a nudge. Banning junk food does not.

Perhaps the most frequently mentioned nudge is the setting of **defaults**, which are pre-set courses of action that take effect if nothing is specified by the decision-maker. This type of nudge, which works with a human tendency for inaction, appears to be particularly successful, as people may stick with a choice for many years (Gill, 2018).

On a cost-adjusted basis, the effectiveness of nudges is often greater than that of traditional approaches (Benartzi et al., 2017).

Questions about the theoretical and practical value of nudging have been explored (Kosters & Van der Heijden, 2015) with respect to their ability to produce lasting behavior change (Frey & Rogers, 2014), as well as their assumptions of irrationality and lack of agency (Gigerenzer, 2015). There may also be limits to nudging due to non-cognitive constraints and population differences, such as a lack of financial resources if nudges are designed to increase savings (Loibl et al., 2016). Limits in the application of nudges speak to the value of experimentation in order to test behavioral interventions prior to their implementation.

As a complementary approach that addresses the shortcomings of nudges, Hertwig and Grüne-Yanoff (2017) propose the concept of boosts, a decision-making aid that fosters people's competence to make informed choices. (See also **choice architecture**.)

1/N (heuristic)

1/N is a trade-off heuristic, one that assigns equal weights to all cues or alternatives (Gigerenzer & Gaissmaier, 2011). Under the 1/N rule, resources are allocated equally to each of N alternatives. For example, in the (one-shot) **ultimatum game**, participants most frequently split their money equally. Similarly, people often hedge their money in investments by allocating equal amounts to different options. 1/N is a form of **naive allocatio**n of resources.

O

Optimism bias

People tend to overestimate the probability of positive events and underestimate the probability of negative events happening to them in the future (Sharot, 2011). For example, we may underestimate our risk of getting cancer and overestimate our future success on the job market. A number of factors can explain unrealistic optimism, including perceived control and being in a good mood (Helweg-Larsen & Shepperd, 2001). (See also **overconfidence**.)

Ostrich effect

See **Information avoidance**

Overconfidence (effect)

The overconfidence effect is observed when people's subjective confidence in their own ability is greater than their objective (actual) performance. It is frequently measured by having experimental participants answer general knowledge test questions. They are then asked to rate how confident they are in their answers on a scale. Overconfidence is measured by calculating the score for a person's average confidence rating relative to the actual proportion of questions answered correctly.

A big range of issues have been attributed to overconfidence more generally, including the high rates of entrepreneurs who enter a market despite the low chances of success (Moore & Healy, 2008). Among investors, overconfidence has been associated with excessive risk-taking (e.g. Hirshleifer & Luo, 2001), concentrated portfolios (e.g. Odean, 1998) and overtrading (e.g. Grinblatt & Keloharju, 2009). The **planning fallacy** is another example of overconfidence, where people underestimate the length of time it will take them to complete a task, often ignoring past experience (Buehler et al., 1994). (See also **optimism bias**.)

Over-justification effect

This effect occurs when a person's intrinsic interest in a previously unrewarded activity decreases after they engage in that activity as a means to achieving an extrinsic goal (e.g. financial reward) (Deci et al., 1999). As a result, the number of hours worked by volunteers, for

instance, may be negatively affected by small financial rewards (Frey & Goette, 1999) (see also **incentives**).

P

Pain of paying

People don't like to spend money. We experience pain of paying (Zellermayer, 1996), because we are **loss averse**. The pain of paying plays an important role in consumer self-regulation to keep spending in check (Prelec & Loewenstein, 1998). This pain is thought to be reduced in credit card purchases, because plastic is less tangible than cash, the depletion of resources (money) is less visible, and payment is deferred. Different personality types experience different levels of pain of paying, which can affect spending decisions. Tightwads, for instance, experience more of this pain than spendthrifts. As a result, tightwads are particularly sensitive to marketing contexts that make spending less painful (Rick, 2018). (See also **mental accounting**.)

Partition dependence

See **Naive allocation**

Partitioning

The rate of consumption can be decreased by physically partitioning resources into smaller units, for example cookies wrapped individually or money divided into several envelopes. When a resource is divided into smaller units (e.g. several packs of chips), consumers encounter additional decision points—a psychological hurdle encouraging them to stop and think. In addition to the cost incurred when resources are used, opening a partitioned pool of resources incurs a psychological transgression cost, such as feelings of guilt (Cheema & Soman, 2008). Related research has found that separate mental payment accounts (i.e. envelopes with money) can disrupt a shopping momentum effect that may occur after an initial purchase (Dhar et al., 2007). (For related ideas, see also **mental accounting**).

Peak-end rule

According to the peak-end rule, our memory of past experience (pleasant or unpleasant) does not correspond to an average level of positive or negative feelings, but to the most extreme point and the end of the episode (Kahneman, 2000b). The rule developed from the finding that evaluations of a past episode seem to be determined by a weighted average of 'snapshots' of an experience, such as moments in a film, thus neglecting its actual duration (Fredrickson & Kahneman, 1993), as well research showing that people would prefer to repeat a painful experience if it is followed by a slightly less painful one (Kahneman et al., 1993). In terms of memories, remembered **utility** is more important than total utility (Kahneman, 2000a). People's memories of prototypical moments are related to the judgments made when people apply a **representativeness heuristic** (Kahneman, 2000b).

Planning fallacy

Originally proposed by Kahneman and Tversky (1979b), the planning fallacy is the tendency for individuals or teams to underestimate the time and resources it will take to complete a project. This error occurs when forecasters overestimate their ability and underestimate the possible risk associated with a project. Without proper training teams of individuals can exacerbate this phenomena causing projects to be based on the team's confidence rather than statistical projections.

One way to combat the planning fallacy is to use a method termed Reference Class Forecasting (Flyvbjerg et al., 2005; Kahneman & Tversky, 1979b). This method begins by creating a benchmark using data on similar projects. Then estimates are built based on variances from the benchmark, depending on variables related to the project at hand. For example, a construction company might estimate that building a house will take five weeks instead of the average reference class time of six weeks, because the team at hand is larger and more skilled than previous project teams. (See also **optimism bias**, **overconfidence**.)

Possibility effect

See **Certainty/possibility effects**

Precommitment

Humans need a continuous and consistent self-image (Cialdini, 2008). In an effort to align future behavior, being consistent is best achieved by making a **commitment**. Thus, precommitting to a goal is one of the most frequently applied behavioral devices to achieve positive change. Committing to a specific future action (e.g. staying healthy by going to the gym) at a particular time (e.g. at 7am on Mondays, Wednesdays and Fridays) tends to better motivate action while also reducing **procrastination** (Sunstein, 2014).

The 'Save More Tomorrow' program, aimed at helping employees save more money (Thaler & Benartzi, 2004), illustrates precommitment alongside other ideas from behavioral economics. The program also avoids the perception of **loss** that would be felt with a reduction in disposable income, because consumers commit to saving future increases in income. People's **inertia** makes it more likely that they will stick with the program, because they have to opt out to leave.

Preference

In economics, preferences are evident in theoretically optimal choices or real (behavioral) choices when people decide between alternatives. Preferences also imply an ordering of different options in terms of expected levels of happiness, gratification, **utility**, etc. (Arrow, 1958). Measurement of preferences may rely on **willingness to pay (WTP)** and **willingness to accept (WTA)**. Preferences are sometimes elicited in survey research, which may be associated with a range of problems, such as the hypothetical bias, when stated preferences are different from those expressed in actual choices, or response effects, when subjects return the answer that they perceive the researcher 'expects'. Armin Falk and colleagues have developed cross-culturally valid survey questions that are good predictors of preferences in behavioral

experiments. These include questions about risk taking (see **prospect theory**), **social preferences** (e.g. about **reciprocity**) and **time discounting** (Falk et al., 2012).

Preference reversal

Preference reversal (Lichtenstein & Slovic, 1973) refers to a change in the relative frequency by which one option is favored over another in behavioral experiments, as may be evident in the **less-is-better effect** or **ratio bias**, for example, or **framing effects** more generally. The preferred ordering of a pair of choices is often found to depend on how the choice is presented; this effect contradicts the predictions of rational choice theory. (See also **transitive/intransitive preferences**.)

Present bias

The present bias refers to the tendency of people to give stronger weight to payoffs that are closer to the present time when considering trade-offs between two future moments (O'Donoghue & Rabin, 1999). For example, a present-biased person might prefer to receive ten dollars today over receiving fifteen dollars tomorrow, but wouldn't mind waiting an extra day if the choice were for the same amounts one year from today versus one year and one day from today (see **time discounting**). The concept of present bias is often used more generally to describe impatience or immediate gratification in decision-making.

(Conceptual) Priming

Conceptual priming is a technique and process applied in psychology that engages people in a task or exposes them to stimuli. The prime consists of meanings (e.g. words) that activate associated memories (schema, stereotypes, attitudes, etc.). This process may then influence people's performance on a subsequent task (Tulving et al., 1982). For example, one study primed consumers with words representing either 'prestige' US retail brands (Tiffany, Neiman Marcus, and Nordstrom) or 'thrift' brands (Wal-Mart, Kmart, and Dollar Store). In an ostensibly unrelated task, participants primed with prestige names then gave higher preference ratings to prestige as opposed to thrift product options (Chartrand et al., 2008). Conceptual priming is different from processes that do not rely on activating meanings, such as perceptual priming (priming similar forms), the mere exposure effect (repeated exposure increases liking), affective priming (subliminal exposure to stimuli evokes positive or negative emotions) (Murphy & Zajonc, 1993), or the perception-behavior link (e.g. mimicry) (Chartrand & Bargh, 1999).

The technique of conceptual priming has become a promising approach in the field of economics, particularly in the study of the economic effects of social identity (see **identity economics**) and **social norms** (Cohn & Maréchal, 2016).

(Myopic) Procrastination

People often put off decisions, which may be due to **self-control** problems (leading to **present bias**), **inertia**, or the complexity of decision-making (see **choice overload**). Various **nudge** tools, such as **precommitment**, can be used to help individuals overcome procrastination. Choice architects can also help by providing a limited time window for action (see **scarcity heuristic**) or a focus on **satisficing** (Johnson et al., 2012).

Projection bias

In behavioral economics, projection bias refers to people's assumption that their own tastes or **preferences** will remain the same over time (Loewenstein et al., 2003). Both transient preferences in the short-term (e.g. due to hunger or weather conditions) and long-term changes in tastes can lead to this bias. For example, people may overestimate the positive impact of a career promotion due to an under-appreciation of **(hedonic) adaptation**, put above-optimal variety in their planning for future consumption (see **diversification bias**), or underestimate the future selling price of an item by not taking into account the **endowment effect**. Consumers' under-appreciation of **habit** formation (associated with higher consumption levels over time) may lead to projection bias in planning for the future, such as retirement savings.

Projection bias also affects choices in other settings, such as medical decisions (Loewenstein, 2005), gym attendance (Acland & Levy, 2015), catalog orders (Conlin et al., 2007), as well as car and housing markets (Busse et al., 2012).

Prospect theory

Prospect theory is a behavioral model that shows how people decide between alternatives that involve risk and uncertainty (e.g. % likelihood of gains or losses). It demonstrates that people think in terms of expected **utility** relative to a **reference** point (e.g. current wealth) rather than absolute outcomes. Prospect theory was developed by **framing** risky choices and indicates that people are **loss-averse**; since individuals dislike losses more than equivalent gains, they are more willing to take risks to avoid a loss. Due to the biased weighting of probabilities (see **certainty/possibility effects**) and loss aversion, the theory leads to the following pattern in relation to risk (Kahneman & Tversky, 1979a; Kahneman, 2011):

	GAINS	LOSSES
HIGH PROBABILITY	95% chance to win $10,000	95% chance to lose $10,000
(Certainty Effect)	Fear of disappointment	Hope to avoid loss
	RISK-AVERSE	RISK-SEEKING
LOW PROBABILITY	5% chance to win $10,000	5% chance to lose $10,000
(Possibility Effect)	Hope of large gain	Fear of large loss
	RISK-SEEKING	RISK-AVERSE

Prospect theory has been applied in diverse economic settings, such as consumption choice, labor supply, and insurance (Barberis, 2013).

R

Ratio bias

We find it harder to deal with proportions or ratios than with absolute numbers. For example, when asked to evaluate two movie rental plans with a contracted scale (e.g. 7 and 9 new movies per week for Plans A and B, respectively) as opposed to an equivalent offering with an expanded scale (364 and 468 movies per year, respectively), consumers favor the better plan (Plan B) more in the scale expansion than contraction condition (Burson et al., 2009). This is because our experiential system—unlike the rational system—encodes information as concrete representations, and absolute numbers are more concrete than ratios or percentages (Kirkpatrick & Epstein, 1992). (See also **framing**, **dual-system theory**, **affect heuristic**.)

Reciprocity

Reciprocity is a **social norm** that involves in-kind exchanges between people—responding to another's action with another equivalent action. It is usually positive (e.g. returning a favor), but it can also be negative (e.g. punishing a negative action) (Fehr & Gächter, 2000). Reciprocity is of interest to behavioral economists because it does not involve an economic exchange, and it has been studied by means of experimental games (see **behavioral game theory**). Organizations often apply reciprocity norms in practice. Charities take advantage of reciprocity if they include small gifts in solicitation letters (e.g. Falk, 2007), while hospitals may ask former patients for donations (e.g. Chuan et al., 2018).

Reciprocity is also used as a social influence tool in the form of 'reciprocal concessions', an approach also known as the 'door-in-the-face' technique. It occurs when a person makes an initial large request (e.g. to buy an expensive product), followed up by a smaller request (e.g. a less expensive option), if the initial request is denied by the responder. The responder then feels obligated to 'return the favor' by agreeing to the conceded request (Cialdini et al., 1975).

Recognition heuristic

While a core heuristic in the *heuristics and biases* tradition of Tversky and Kahneman is **availability**, a conceptually similar heuristic proposed in Gigerenzer's *fast and frugal* tradition is recognition. In the fast and frugal view, the application of heuristics is an "ecologically rational" strategy that makes best use of the limited information available to individuals (Goldstein & Gigerenzer, 2002). Recognition is an easily accessible cue that simplifies decision-making and indicates that sometimes less knowledge can lead to more accurate inferences. In one experiment, participants had to judge which one of two cities had the greater population size. Results showed that the vast majority of choices were based on recognition of the city name. What's more, the study indicated a less-is-more effect, whereby people's guesses are more accurate in a domain of which they have little knowledge than one about which they know a lot. American participants did better on German cities, while German participants had higher scores on American cities (Goldstein & Gigerenzer, 2002). (See also **satisficing**.)

Reference dependence

Reference dependence is one of the fundamental principles of prospect theory and behavioral economics more generally. In **prospect theory** (Kahneman & Tversky, 1979a), people evaluate outcomes relative to a reference point, and then classify gains and losses (see also **loss aversion**, **endowment effect**). Reference dependence can apply to any decision involving risk and uncertainty. Online privacy research, for example, has shown that identical privacy notices do not always result in the same levels of disclosure (Adjerid et al., 2013). Consumers evaluate privacy notices relative to the status quo—their current level of protection. When privacy notices are preceded by notices that are less protective, people disclose more compared to those who have experienced no change in privacy protection. The converse is the case if preceding privacy notices are more protective.

Regret aversion

When people fear that their decision will turn out to be wrong in hindsight, they exhibit regret aversion. Regret-averse people may fear the consequences of both errors of omission (e.g. not buying the right investment property) and commission (e.g. buying the wrong investment property) (Seiler et al., 2008). The effect of anticipated regret is particularly well-studied in the domain of health, such as people's decisions about medical treatments. A meta-analysis in this area suggests that anticipated regret is a better predictor of intentions and behavior than other kinds of anticipated negative emotions and evaluations of risk (Brewer et al., 2016). (See also **loss aversion**, **status quo bias**, **sunk cost fallacy**, **fear of missing out**, **information avoidance**, and **action bias**.)

Regulatory focus theory

The psychological theory of regulatory focus (Florack et al., 2013; Higgins, 1998) holds that human motivation is rooted in the approach of pleasure and the avoidance of pain and differentiates a promotion focus from a prevention focus. The former involves the pursuit of goals that are achievement- or advancement-related, characterized by eagerness, whereas the latter focuses on security and protection, characterized by vigilance. For example, a person can become healthy by either engaging in physical activity and eating organic food, or refraining from bad habits such as smoking or eating junk food. Prevention and promotion orientations are a matter of both enduring dispositions and situational factors.

According to *regulatory fit* theory, messages and **frames** that are presented as gains are more influential under a promotion focus, whereas those presented as losses carry more weight in a prevention focus. For example, research by Lee and Aaker (2004) found that 'gain frames' in advertising ("Get energized") lead to more favorable attitudes when the body of the advertising message is written in promotional terms (e.g. emphasizing the energy benefits of drinking grape juice), whilst 'loss frames' ("Don't miss out on getting energized!") have a more favorable effect when the main body of the ad focuses on prevention (e.g. stressing the cancer reduction benefits of drinking grape juice).

Representativeness heuristic

Representativeness is one of the major general purpose **heuristics**, along with **availability** and **affect**. It is used when we judge the probability that an object or event A belongs to class B by looking at the degree to which A resembles B. When we do this, we neglect information about the general probability of B occurring (its base rate) (Kahneman & Tversky, 1972). Consider the following problem:

Bob is an opera fan who enjoys touring art museums when on holiday. Growing up, he enjoyed playing chess with family members and friends. Which situation is more likely?

A. Bob plays trumpet for a major symphony orchestra

B. Bob is a farmer

A large proportion of people will choose A in the above problem, because Bob's description matches the stereotype we may hold about classical musicians rather than farmers. In reality, the likelihood of B being true is far greater, because farmers make up a much larger proportion of the population.

Representativeness-based evaluations are a common cognitive shortcut across contexts. For example, a consumer may infer a relatively high product quality from a store (generic) brand if its packaging is designed to resemble a national brand (Kardes et al., 2004). Representativeness is also at work if people think that a very cold winter is indicative of the absence of global warming (Schubert & Stadelmann, 2015) or when gamblers prefer lottery tickets with random-looking number sequences (e.g. 7, 16, 23, ...) over those with patterned sequences (e.g. 10, 20, 30, ...) (Krawczyk & Rachubik, 2019). In finance, investors may prefer to buy a stock that had abnormally high recent returns (the extrapolation bias) or misattribute a company's positive characteristics (e .g. high quality goods) as an indicator of a good investment (Chen et al., 2007).

Risk-as-feelings

'Consequentialist' perspectives of decision-making under risk or uncertainty (risky-choice theories, see e.g. **prospect theory**) tend to either focus on cognitive factors alone or consider emotions as an anticipated outcome of a decision.

The risk-as-feelings hypothesis (Loewenstein et al., 2001), on the other hand, also includes emotions as an anticipatory factor, namely feelings at the moment of decision-making.

In contrast to theories such as the **affect heuristic**, where feelings play an informational role helping people to decide between alternatives, risk-as-feelings can account for cases where choices (e.g. refusal to fly due to a severe anxiety about air travel) diverge from what individuals would objectively consider the best course of action.

S

Satisficing

According to Herbert Simon, people tend to make decisions by satisficing (a combination of sufficing and satisfying) rather than optimizing (Simon, 1956); decisions are often simply 'good enough' in light of the costs and constraints involved. As a **heuristic**, satisficing individuals will choose options that meet their most basic decision criteria. A focus on satisficing can be used by **choice architects** when decision makers are prone to procrastination (Johnson et al., 2012).

Scarcity (heuristic)

When an object or resource is less readily available (e.g. due to limited quantity or time), we tend to perceive it as more valuable (Cialdini, 2008). Scarcity appeals are often used in marketing to induce purchases. Marketing messages with limited quantity appeals are thought to be more effective than limited time appeals, because they create a sense of competition among consumers (Aggarwal et al., 2011). An experiment (Lee & Seidle, 2012) that used wristwatch advertisements as stimuli exposed participants to one of two different product descriptions "Exclusive limited edition. Hurry, limited stocks" or "New edition. Many items in stock". They then had to indicate how much they would be willing to pay for the product. The average consumer was willing to pay an additional 50% if the watch was advertised as scarce.

Scarcity can be used as an effective strategy by **choice architects** to get people who put off decisions (myopic procrastinators) to act (Johnson et al., 2012).

Scarcity (psychology of)

People have a "mental bandwidth," or brainpower, made up of attention, cognition, and **self-control** (Mullainathan & Sharif, 2013), which consists of finite resources that may become reduced or **depleted**. The scarcity mindset entails a feeling of not having enough of something. According to Mullainathan and Sharif, anyone can experience cognitive scarcity, but it is particularly pronounced for people living in poverty. On the positive side, this may induce limited focus that can be used productively. The downside is 'tunneling', which inhibits the cognitive power needed to solve problems, reason, or retain information. Reduced bandwidth also impairs executive control, compromising people's ability to plan and increasing impulsiveness whereby the focus becomes immediate—put food on the table, find shelter, or pay the utility bill (cf **present bias**).

The financial and life worries associated with poverty, and the difficult tradeoffs low-income individuals must make on a regular basis, all reduce their cognitive capacity. Limits on self-control or planning may lead some individuals to sacrifice future rewards in favor of short-term needs. **Procrastination** over important tasks is also more likely, as is avoidance of expressing negative emotions.

Self-control

Self-control, in psychology, is a cognitive process that serves to restrain certain behaviors and emotions vis-a-vis temptations and impulses. This aspect of self-regulation allows individuals to achieve goals (Diamond, 2013). (See also **intertemporal choice**, **present bias**, **dual-self model**, **dual-system theory**, **ego depletion**, and **decision fatigue**.)

Social norm

Social norms signal appropriate behavior and are classed as behavioral expectations or rules within a group of people (Dolan et al., 2010). Social norms of exchange, such as **reciprocity**, are different from market exchange norms (Ariely, 2008). Normative feedback (e.g. how one's energy consumption level compares to the regional average) is often used in behavior change programs (Allcott, 2011) and has been particularly effective to prompt pro-environmental behavior (Farrow et al., 2017). This feedback can either be descriptive, representing what most people do for the purpose of comparison (e.g. "The majority of guests in this room reuse their towels"; Goldstein et al., 2008), or injunctive, communicating approved or disapproved behavior (e.g. "Please don't…."; Cialdini et al., 2006). The latter is often more effective when an undesirable behavior is more prevalent than desirable behavior (Cialdini, 2008).

Social preferences

Social preferences (e.g. Fehr & Fischbacher, 2002) are one type of **preference** investigated in behavioral economics and relate to the concepts of **reciprocity**, **altruism**, **inequity aversion**, and **fairness**.

Social proof

The influence exerted by others on our behavior can be expressed as being either normative or informational. Normative influence implies conformity in order to be accepted or liked (Aronson et al., 2005), while informational influence occurs in ambiguous situations where we are uncertain about how to behave and look to others for information or cues. Social proof is an informational influence (or descriptive norm) and can lead to **herd behavior**. It is also sometimes referred to as a **heuristic**. Research suggests that receiving information about how others behave (social proof) leads to greater compliance among people from collectivist cultures, whereas information on the individual's past behavior (consistency/**commitment**) is associated with greater compliance for people from individualist cultures (Cialdini et al., 1999).

Status quo bias

Status quo bias is evident when people prefer things to stay the same by doing nothing (see also **inertia**) or by sticking with a decision made previously (Samuelson & Zeckhauser, 1988). This may happen even when only small transition costs are involved and the importance of the decision is great.

Field data from university health plan enrolments, for example, show a large disparity in health plan choices between new and existing enrollees. One particular plan with significantly more favorable premiums and deductibles had a growing market share among new employees, but

a significantly lower share among older enrollees. This suggests that a lack of switching could not be explained by unchanging **preferences**.

Samuelson and Zeckhauser note that status quo bias is consistent with **loss aversion**, and that it could be psychologically explained by previously made **commitments**, **sunk cost thinking**, **cognitive dissonance**, a need to feel in control and **regret avoidance**. The latter is based on Kahneman and Tversky's observation that people feel greater regret for bad outcomes that result from new actions taken than for bad consequences that are the consequence of inaction (Kahneman & Tversky, 1982).

While status quo bias is frequently considered to be irrational, sticking to choices that worked in the past is often a safe and less difficult decision due to informational and cognitive limitations (see **bounded rationality**). For example, status quo bias is more likely when there is **choice overload** (Dean et al., 2017) or high uncertainty and deliberation costs (Nebel, 2015).

Sunk cost fallacy

Individuals commit the sunk cost fallacy when they continue a behavior or endeavor as a result of previously invested resources (time, money or effort) (Arkes & Blumer, 1985). This fallacy, which is related to **loss aversion** and **status quo bias**, can also be viewed as bias resulting from an ongoing **commitment**.

For example, individuals sometimes order too much food and then over-eat just to "get their money's worth". Similarly, a person may have a $20 ticket to a concert and then drive for hours through a blizzard, just because s/he feels that s/he has to attend due to having made the initial investment. If the costs outweigh the benefits, the extra costs incurred (inconvenience, time or even money) are held in a different **mental account** than the one associated with the ticket transaction (Thaler, 1999).

Research suggests that rats, mice and humans are all sensitive to sunk costs after they have made the decision to pursue a reward (Sweis et al., 2018).

System 1/2

See **Dual-system theory**

T

Take-the-best (heuristic)

Take-the-best is a simple decision-making shortcut that people may apply when choosing between alternatives. It is a one-reason decision rule, a type of **heuristic** where judgments are based on a single "good" reason only, ignoring other cues (Gigerenzer & Gaissmaier, 2011). Using the take-the-best heuristic, a decision maker will base the choice on one attribute that is perceived to discriminate most effectively between the options (Gigerenzer & Goldstein, 1996). Airport customs officers, for example, may determine whether a passenger is selected for a search by choosing the best of various cues, such as airport of origin, nationality, or amount

of luggage (Pachur & Marinello, 2013). One study investigated voters' perceptions of how US presidential candidates would handle the single issue that voters regarded as most important, such as the state of the economy or foreign policy. A model based on this issue (as a take-the-best attribute used by potential voters) correctly chose the winner of the popular vote in 97% of all predictions (Graefe & Armstrong, 2012).

Take-the-first (heuristic)

Take-the-first is a fluency **heuristic**. Fluency-based decision-making strategies occur when different alternatives are recognized, but the one that is recognized faster is given higher value with respect to a criterion (Gigerenzer & Gaissmaier, 2011). In the case of take-the-first, decision-makers simply choose the first alternative that comes to mind (Johnson & Raab, 2003). Similar to other **fast and frugal** approaches, this strategy is most suitable in situations that present limitations to people's ability to analyze information carefully. When experienced handball players were asked to decide between taking a shot or passing the ball in video sequences, the first option that came to mind tended to be superior to later options or a condition under which when they had more time to analyze the situation.

Time (temporal) discounting

Time discounting research investigates differences in the relative valuation placed on rewards (usually money or goods) at different points in time by comparing its valuation at an earlier date with one for a later date (Frederick et al., 2002). Evidence shows that present rewards are weighted more heavily than future ones. Once rewards are very distant in time, they cease to be valuable. Delay discounting can be explained by impulsivity and a tendency for immediate gratification (see **self-control**), and it is particularly evident for addictions such as nicotine (Bickel et al., 1999).

Hyperbolic discounting theory suggests that discounting is not time-consistent; it is neither linear nor occurs at a constant rate. It is usually studied by asking people questions such as "Would you rather receive £100 today or £120 a month from today?" or "Would you rather receive £100 a year from today or £120 a year and one month from today?" Results show that people are happier to wait an extra month for a larger reward when it is in the distant future. In hyperbolic discounting, values placed on rewards decrease very rapidly for small delay periods and then fall more slowly for longer delays (Laibson, 1997). (See also **present bias**.)

Research has shown different ways to reduce discounting, such as **primed** future focus (Sheffer et al., 2016), mental simulation of future experiences (e.g. Stein et al., 2016), and interactions with visual representations of one's future self (Hershfield et al., 2011).

Transitive/intransitive preferences

Preference transitivity is a hallmark of rational choice theory. It holds that if, out of a set of options, A is preferred to B and B to C, then A must also be preferred to C (e.g. von Neumann & Morgenstern, 1947),. Intransitive preferences (i.e. C is preferred to A) violate the transitivity assumption and are sometimes used to indicate **System 1 vs 2** decision-making (Gallo et al., 2016). (See also **preference reversal** and **decoy effect**.)

Trust

Trust pervades human societies. It is indispensable in friendships, love, family, organizations and politics. Interpersonal trust is a mental construct with implications for social functioning and economic behavior as studied by **trust games**, for example.

Although neoclassical economic theory suggests that trust in strangers is irrational, trust and trustworthiness can be widely observed across societies. In fact, **reciprocity** exists as a basic element of human relationships and behavior, and this is accounted for in the trust extended to an anonymous counterpart (Berg et al., 1995). The nature of trusting behavior is a multi-faceted part of psychology, investigated in terms of underlying dispositions, intergroup processes, and cognitive expectations (Evans & Krueger, 2009). Behavioral and biological evidence indicates that trusting is not simply a special case of risk-taking, but based rather on important forms of **social preferences**, such as betrayal aversion (Fehr, 2010).

Both trust and trustworthiness increase when individuals are closer socially, but the latter declines when partners come from different social groups, such as nationality or race. Furthermore, high status individuals are found to be able to elicit more trustworthiness in others (Glaeser et al., 2000). For example, CEOs are considerably more trusting and exhibit more trustworthiness than students. Trust seems to reinforce trustworthy behavior. In a behavioral experiment, trustworthiness was highest when the threat to punish was available but not used, and lowest when the threat to punish was actually used. Paradoxically, however, most CEOs and students used the punishment threat; although CEOs made use of it significantly less (Fehr & List, 2004).

Trust game

Similar to the **dictator game**, this game asks participants to split money between themselves and someone else. However, the trust game first asks Player A to determine an initial endowment of zero or a higher value (e.g. $5). The money is then multiplied (e.g. tripled to $15) by the experimenter and given to Player B, who is then asked to return an amount of zero or a higher value back to Player A. The game is about **reciprocity** and **trust**, because Player A must decide how much of the endowment to give to Player B in the hope of receiving at least the same amount in return. In the original experiment (Berg et al., 1995), 30 out of 32 first players sent money, and 11 of these 30 decisions resulted in a payback that was greater than the initial amount sent. This finding confounds the prediction offered by standard economic assumptions (see ***homo economicus***) that there would be no trust. However, as with other games, critics have raised questions about what the trust game actually measures (Brülhart & Usunier, 2012). (See also **ultimatum game**.)

U

Ultimatum game

The ultimatum game is an early example of research that uncovered violations of standard assumptions of rationality (see ***homo economicus***). In the experiment, one player (the pro-

poser/allocator) is endowed with a sum of money and asked to split it between him/herself and an anonymous player (the responder/recipient). The recipient may either accept the allocator's proposal or reject it, in which case neither of the players will receive anything. From a traditional game-theoretic perspective, the allocator should only offer a token amount and the recipient should accept it. However, results showed that most allocators offered more than just a token payment, and many went as far as offering an equal split. Some offers were declined by recipients, suggesting that they were willing to make a sacrifice when they felt that the offer was unfair (see also **inequity aversion** and **fairness**) (Guth et al., 1982). (See also **dictator game** and **trust game**.)

Utility

In economics, utility (e.g. Stigler, 1950) refers to the benefits (satisfaction or happiness) consumers derive from a good, and it can be measured based on individuals' choices between alternatives or **preferences** evident in their **willingness to pay or accept**. Behavioral economists have questioned past assumptions that utility is always maximized, and they have worked with both traditional and new utility measures.

- *Expected utility* (Bernoulli, 1954 [1738]) has been used in economics as well as game and decision theory, including **prospect theory**, and is based on choices with uncertain outcomes.
- *Discounted utility* is a form of utility used in the **intertemporal choice** domain of behavioral economics (Berns et al., 2007).
- *Experience(d) utility* (Kahneman et al., 1997) relates to actual (hedonic) experiences associated with an outcome (in contrast to choice-based decision utility), which is associated with theories on forecasting errors like the **diversification bias**.
- *Remembered utility* (Kahneman et al., 1997) suggests that people's choices are also based on their memories of past events or experiences and is invoked in the **peak-end rule**.
- *Instant utility* and *forecasted utility* have been used in the area of **intertemporal choice**, such as research on the **empathy gap**, showing that forecasted utility is biased in the direction of instant utility (Camerer & Loewenstein, 2004).
- *Procedural utility* is relevant if people value not only outcomes, but also the processes that lead to these outcomes (Frey, Benz, & Stutzer, 2004).
- *Social utility* has been proposed in relation to **game theory**, where players not only always act self-interestedly, but also show concerns about the perceived intentions of other players and fairness (Camerer, 1997).
- *Transaction utility* accounts for perceived merit or quality of a deal, rather than just the value of a good or service relative to its price captured by *acquisition utility* (Thaler, 1985).

W

Willingness to pay (WTP) / willingness to accept (WTA)

In economics, willingness to accept (WTA) and willingness to pay (WTP) are measures of preference that do not rely on actual choices between alternative options. Instead, they ask individuals to specify monetary amounts. WTA is a measure of the minimum financial compensation that a person would need in order to part with a good or to put up with something undesirable (such as pollution or crime). Willingness to pay (WTP) is the opposite—the maximum amount of money someone is willing to pay for a good or to avoid something undesirable. According to standard economic intuition, WTP should be relatively stable across decision contexts and WTA should be very close to WTP for a given good.

Behavioral economics, however, has shown that WTP and WTA may be context-dependent. For example, Thaler (1985) found evidence that people presented with a hypothetical scenario of lying on a beach and craving a beer would be willing to pay significantly more for a beer purchased at a resort hotel as opposed to a rundown grocery store (see also transaction **utility** and **mental accounting**). In addition, sometimes the average WTA for a good exceeds its WTP, which may be indicative of an **endowment effect**, i.e. people value something more if they already own it. Research has also shown that the farther a good is from being an ordinary private (market) good, the more likely it is that WTA exceeds WTP. The WTA-to-WTP ratio is particularly high for health/safety and public/non-market goods (Horowitz & McConnel, 2002).

Winner's curse

The winner's curse describes the phenomenon that the winning bid of an auction tends to exceed the true (and uncertain to the bidders) value of the commodity, resulting, in effect, in the winner overpaying. Emotion, **cognitive biases** and incomplete information seem to account for this behavior, which can, in extremis, lead to **bubbles** in the stock or real estate markets.

In his seminal paper, "Anomalies: The Winner's Curse", Richard Thaler (1988) stated that if he were to auction of a jar of coins amongst his students, (1) the average bid would be significantly less than the actual value of the coins (bidders are risk averse) and (2) the winning bid would exceed the value of the jar (even if it might be overpriced). This is not consistent with the idea of all bidders being rational. In theory, if perfect information were available to everyone and all participants were completely rational in their decision-making and skilled at valuation, no overpayments should occur. However, the winner's curse, a robust and persistent deviation from theoretical predictions established in experimental economics, reflects **bounded rationality** quite well, since people have difficulty in performing contingent reasoning on future events (Charness & Levin, 2009) (see **intertemporal choice**). Not surprisingly, in an experimental demonstration of the winner's curse, the degree of uncertainty concerning the value of the commodity and the number of competing bidders were identified as the two factors that affect the incidence and magnitude of this curse (Bazerman & Samuelson, 1983).

In an attempt to overcome the winner's curse, an experiment has identified two factors that account for its persistence: a variability in the environment, which leads to ambiguous feedback (i.e. choices and outcomes being only partially correlated), and the tendency of decision makers to learn adaptively. Therefore, reducing the variance in the feedback (such that choices and outcomes are correlated), performance can be significantly improved (Bereby-Meyer & Grosskopf, 2008).

Z

Zero price effect

The zero price effect suggests that traditional cost-benefits models cannot account for the psychological effect of getting something for free. A linear model assumes that changes in cost are the same at all price levels and benefits stay the same. As a result, a decrease in price will make a good equally more or less attractive at all price points. The zero price model, on the other hand, suggests that there will be an increase in a good's intrinsic value when the price is reduced to zero (Shampanier et al., 2007). Free goods have extra pulling power, as a reduction in price from $1 to zero is more powerful than a reduction from $2 to $1. This is particularly true for hedonic products—things that give us pleasure or enjoyment (e.g. Hossain & Saini, 2015). A core psychological explanation for the zero price effect has been the **affect heuristic**, whereby options that have no downside (no cost) trigger a more positive affective response.

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	Tepper School of Business	PhD in Behavioral Economics
		(see also Dynamic Decision Making Laboratory)
		(see also Center for Behavioral and Decision Research)
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Claremont Graduate University	School of Social Science, Policy, and Evaluation	PhD in Economics
		(see also Center for Neuroeconomics Studies)
Columbia University	Columbia Business School	MBA, MS, and PhD in Business
		(see also Center for Decision Sciences)
	Department of Economics	MA and PhD in Economics
		(see also Cognitive and Behavioral Economics Initiative)
		(see also Cognition & Decision Lab)
Cornell University	Charles H. Dyson School of Applied Economics and Management	PhD in Applied Economics and Management
		Master of Professional Studies (MPS) in Applied Behavioral Economics and Individual Choice
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Georgia State University	Andrew Young School of Policy Studies	PhD in Economics MA in Economics (see also Experimental Economics Center)
Harvard University	Department of Economics School of Public Health	PhD in Economics MS and PhD in Social and Behavioral Sciences
Johns Hopkins University	Johns Hopkins Bloomberg School of Public Health	PhD in Social and Behavioral Sciences
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New York University	Graduate School of Arts & Science	MAs and PhDs in Economics, Politics and Psychology (see also Center for Experimental Social Science) (see also Institute for the Study of Decision Making)
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Manchester Metropolitan University	Department of Economics, Policy and International Business	MSc Behavioural and Economic Science
Middlesex University	Business School	MSc in Behavioural Economics in Action
Queen Mary University of London	School of Economics and Finance	MSc in Behavioural Finance
University College London	Division of Psychology And Language Sciences	Executive Programme in Behavioural Science
	Division of Psychology And Language Sciences	MSc in Cognitive and Decision Sciences PhD in Experimental Psychology
	School of Management and the Behavioural Insights Team	PhDs in Management with Behavioural Science and Policy
University of Bath		MSc Applied Psychology and Economic Behaviour
University of Cambridge	Judge Business School	MBA, Executive MBA and PhDs in Business Economics, Marketing, etc.
	Faculty of Economics	PhD in Economics (see also Cambridge Experimental and Behavioural Economics Group)
University of East Anglia	Department of Economics	MSc in Behavioural and Experimental Economics (see also Centre for Behavioural and Experimental Social Science)
University of Edinburgh	School of Philosophy, Psychology and Language Sciences	MA in Psychology and Economics
University of Essex	Department of Economics	MSc in Behavioural Economics

University of Exeter	School of Business	MSc in Behavioural Economics and Finance
University of Huddersfield		MSc in Behavioural Economics and Decision Science
University of Leeds	Leeds University Business School	MSc in Business Analytics and Decision Sciences (see also Centre for Decision Research)
University of Nottingham	School of Economics	MSc in Behavioural Economics PhD in Economics (see also Centre for Decision Research and Experimental Economics)
University of Oxford	Department of Economics	DPhil in Economics (see also Behavioural Economics Research Group) (see also Nuffield Centre for Experimental Social Sciences)
University of Reading	Henley Business School	MSc Behavioural Finance
University of Stirling	Stirling Management School	MSc in Behavioural Decision Making for Finance MSc in Behavioural Science for Management (see also Behavioural Science Centre)
University of Warwick (Warwick Business School)	Interdisciplinary	MSc in Behavioural and Economic Science **See pp. 220-222**
	Department of Psychology	MSc Behavioural and Data Science PhD in Psychology (see also Behavioural Science Group) (see also Decision Research at Warwick)

The Netherlands

Erasmus University Rotterdam	Erasmus School of Economics	Master in Economics and Business (Behavioural Economics specialization) PhD in Applied Economics (Behavioural Economics group)

Leiden University	Institute of Psychology	Master in Psychology (Economic and Consumer Psychology specialization)
Maastricht University	School of Business and Economics	Master in Human Decision Science
Radboud University Nijmegen	Department of Social Science	Master in Behavioural Science Master in Economics (Economics, Behaviour and Policy specialization)
Tilburg University	Department of Social Psychology School of Social and Behavioral Sciences Tilburg University Graduate Schools	Master in Social Psychology (Economic Psychology track) Research Master in Social and Behavioral Sciences Research Master and PhDs in Economics, Business (Marketing track) and Social & Behavioural Sciences (see also Tilburg Institute for Behavioural Economics Research)
University of Amsterdam (Amsterdam Business School / School of Economics)	Business School and School of Economics	Master and PhD in Economics (Research Priority Area Behavioural Economics)
University of Groningen	Faculty of Behavioural and Social Sciences	Research Master in Behavioural and Social Sciences
Utrecht University	Graduate School of Social and Behavioural Sciences	PhD in Social and Behavioural Sciences (see also Behaviour in Social Context)

Germany

Friedrich-Schiller University Jena	Jena Graduate School	PhD in Human Behaviour in Social and Economic Change
Ludwig-Maximilians University Munich	Munich Graduate School of Economics	PhD in Economics (see also Munich Experimental Laboratory for Economic and Social Sciences)
TH Köln		MA in Behavioral Ethics, Economics and Psychology

University of Bonn	Bonn Graduate School of Economics	PhD in Economics (see also Center for Economics and Neuroscience) (see also Bonn Laboratory for Experimental Economics)
University of Kassel		MSc in Economic Behaviour and Governance
University of Konstanz	Graduate School of Decision Sciences	PhDs at the Graduate School of Decision Sciences (interdisciplinary)

Other Countries

Australia

Monash University	Faculty of Business and Economics	Master of Business Economics
	School of Business, Monash University Malaysia.	PhDs in Management and Economics (see also Monash Laboratory for Experimental Economics) (see also Monash Business Behavioural Laboratory)
University of Queensland	School of Economics	Master and PhD in Economics (see also Risk and Sustainable Management Group)
University of Technology Sydney (UTS)	UTS Business School	PhD in Economics (Behavioural or Experimental Economics research field) (See also UTS Behavioural Laboratory)

Austria

University of Vienna	Faculty of Business, Economics, and Statistics	PhD in Economics MSc in Economics (see also Vienna Center for Experimental Economics)
Sigmund Freud University		Master in Psychology (Economic Psychology specialization)

Canada

University of British Columbia	UBC Sauder School of Business	PhD in Marketing and Behavioural Science
University of Saskatchewan	Interdisciplinary	PhD in Applied Economics (Research area in Behavioural and Experimental Economics) (See also Experimental Decision Laboratory)
University of Toronto	Rotman School of Management	MBAs and PhDs in Marketing and Business Economics (see also Behavioural Economics in Action)

Denmark

University of Copenhagen	Department of Economics	MSc and PhD in Economics (See also Centre for Experimental Economics)

Finland

Oulu University in Finland	Business School	Master's program in Economics

France

Paris School of Economics	School of Economics	Masters and PhDs in Economics (see also Parisian Experimental Economics Laboratory)
Toulouse School of Economics		PhD in Economics (Behavioral and Experimental Economics specialization)
University of Paris Panthéon-Sorbonne / University Paris Descrates		Master in Economics & Psychology

Israel

Hebrew University of Jerusalem	The Federmann Center for the Study of Rationality	PhDs at the Federman Center for the Study of Rationality (interdisciplinary)

Ireland

University College Dublin	School of Economics	MSc Behavioural Economics

Italy

Catholic University of the Sacred Heart, Milan	PhD School in Economics and Finance	PhD in Economics (see also Behavioral and Experimental Economics Research Group)

LUISS (Libera Università Internazionale degli Studi Sociali Guido Carli)	LUISS School Of European Political Economy	Master in Behavioral Science and Administration
University of Chieti-Pescara	School of Advanced Studies	PhD in Business and Behavioural Sciences
University of Trento	Doctoral School of Sciences	PhD in Economics and Management (Behavioural Economics)

Norway

Norwegian School of Economics		MSc in Economics, Business and Marketing PhD in Business and Management Science (see also the Choice Lab)

Portugal

Universidade Catolica Portuguesa		Master in Psychology in Business and Economics

Russia

National Research University Higher School of Economics		Master in Applied Social Psychology

Singapore

National University of Singapore	NUS Business School	MBA and PhDs in Management, Decision Sciences and Economics (see also Centre for Behavioural Economics)

Sweden

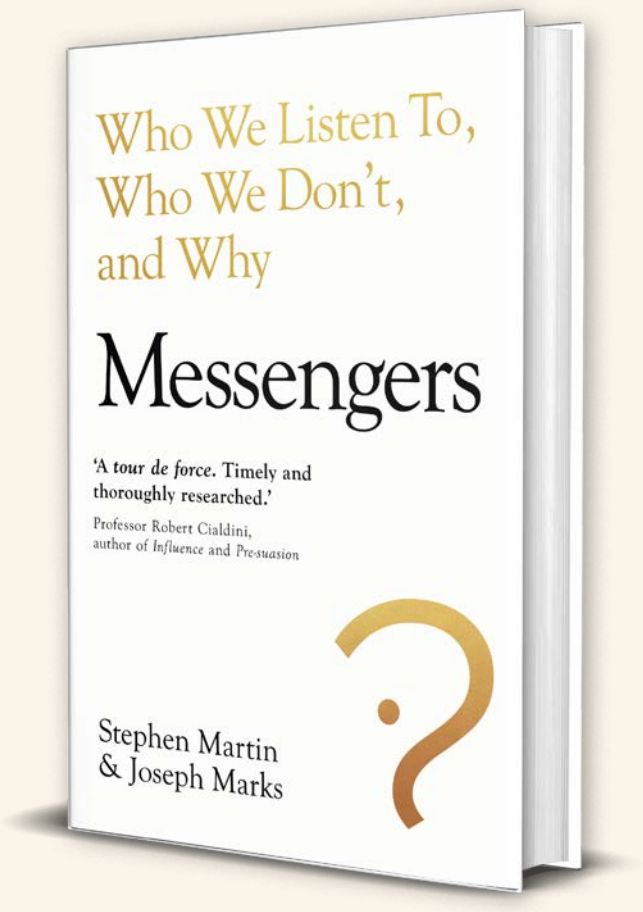
University of Gothenburg	School of Business, Economics, and Law	PhD in Economics (Behavioral Economics concentration)

Switzerland

Conférence Universitaire de Suisse Occidentale		PhD in Behavioral Economics and Experimental Research
University of Zurich (Zurich Graduate School of Economics)	Department of Economics	PhD in Economics and Neuroeconomics (see also Laboratory for Experimental and Behavioral Economics)

Events

Why Do People Listen To Men Like Donald Trump?



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Title	Dates (Location)	Frequency
Note: Event titles followed by an asterisk are primarily academic in nature		

Conferences & Meetings

Conference on Behavioral Economics and Development *	January 25-26, 2019 (Stanford, CA)	Check website
International Conference on Cognitive, Behavioral and Experimental Economics *	February 27-28, 2019 (Sydney, Australia)	Annual
BE.Hive: Climate Change Needs Behavior Change	March 19, 2019 (Washington, DC)	Check website
Behavioral Finance Forum	April 5, 2019 (New York, NY)	Check website
UCL Centre for Behaviour Change Conference	April 8 - 10, 2019 (London, UK)	Annual
BX Arabia	April 12 - 13, 2019 (Beirut, Lebanon)	Check website
Assessing the Contributions of Behavioral Economics to Economic Science (University of Chicago Policy Forum) *	April 25, 2019 (Chicago, IL)	Check website
International Meeting on Experimental and Behavioral Social Sciences (IMEBESS) *	May 2 - 4, 2019 (Utrecht, Netherlands)	Annual
Behavioral Alpha	May 15, 2019 (London, UK)	Check website
Boulder Summer Conference on Consumer Financial Decision Making	May 19 - 21, 2019 (Boulder, CO)	Annual
International Research-to-Practice Conference “Economic Psychology: Past, Present, Future” *	May 27 - 30, 2019 (Saratov, Russia)	Check website
Symposium on Economic Experiments in Developing Countries *	May 30 - 31, 2019 (Berkeley, CA)	Check website
NeuroPsychoEconomics Conference	June 6 - 7, 2019 (Rome, Italy)	Annual
LACEA Behavioral Insights Network Annual Meeting	June 6 - 7, 2019 (Washington, DC)	Annual

Behavioural Finance Working Group Conference	June 6 - 7, 2019 (London, UK)	Annual
Nudgestock	June 7, 2019 (Folkestone, UK)	Annual
Conference on Behavioural Economics and the Economics of Inequality *	June 7 - 8, 2019 (Edinburgh, UK)	Check website
Bounded Rationality in Choice Conference *	June 9 - 10, 2019 (Aarhus, Denmark)	Annual
Experimental Finance *	June 13 - 15, 2019 (Copenhagen, Denmark)	Annual
Behavioral Science & Policy Association Conference	June 14, 2019 (New York NY)	Annual
Advances in Decision Analysis *	June 19 - 21, 2019 (Milan, Italy)	Annual
International Conference of the French Association of Experimental Economics	June 19 - 21, 2019 (Toulouse, France)	Annual
WBIT Behavioural Science Summit	June 20, 2019 (Coventry, UK)	Check website
Singapore Conference on Applied Psychology	June 20 - 21, 2019 (Singapore)	Check website
International Conference on Decision Economics *	June 26 - 28, 2019 (Avila, Spain)	Check website
Economic Science Association (ESA) World Meeting *	July 4 - 7, 2019 (Vancouver, Canada)	Annual
Multidisciplinary Conference on Reinforcement Learning and Decision Making *	July 7 - 10, 2019 (Montreal, Canada)	Biennual
Asia-Pacific Conference on Economics and Finance	July 25 - 26, 2019 (Singapore)	Annual
Early Career Behavioral Economics Conference *	August 16 - 17, 2019 (San Diego, CA)	Annual
TIBER Symposium on Psychology and Economics *	August 23, 2019 (Tilburg, Netherlands)	Annual
SABE IAREP Conference *	September 1 - 4, 2019 (Dublin, Ireland)	Annual
Behavioural Exchange	September 5 - 6, 2019 (London, UK)	Annual

Advances with Field Experiments 2019 Conference *	September 12 - 13, 2019	Annual
Annual Meeting of the Academy of Behavioral Finance & Economics *	September 18 - 21, 2019 (New York, NY)	Annual
Nordic Conference on Behavioral and Experimental Economics *	September 27 - 28, 2019 (Kiel, Germany)	Annual
Society for NeuroEconomics Conference *	October 4 - 6, 2019 (Dublin, Ireland)	Annual
CESifo Area Conference on Behavioural Economics *	October 25 - 26, 2019 (Munich, Germany)	Annual
Society for Judgment and Decision Making Annual Conference *	November 15 - 18, 2019 (Montreal, Canada)	Annual
Behavior, Energy & Climate Change (BECC) Conference	November 17 - 20, 2019 (Sacramento, CA)	Annual
Shopper Brain Conference	November 19 - 21, 2019 (New York, NY)	Check website
Decision Sciences Institute Annual Conference *	November 23 - 25, 2019 (New Orleans, LA)	Annual
Prague Conference on Behavioral Sciences	April 3-4, 2020 (Prague, Czech Republic)	Annual
Measuring Behavior	May 27 - 29, 2020 (Krakow, Poland)	Annual
Foundations of Utility and Risk (FUR) Conference *	July 1 - 4, 2020 (Sydney, Australia)	Biennual

Short Courses & Workshops

TAPMI-Max Planck-Soton Winter School on Bounded Rationality *	January 14-20, 2019 (Manipal, India)	Check website
Innsbruck Winter School on Credence Goods, Incentives and Behavior *	March 16-22, 2019 (Kühtai, Austria)	Check website
Behavioural Economics for Charity Fundraisers Masterclass	March 21, 2019 (London, UK)	Check website
Change for Good: Using Behavioural Economics for a Better World	March 25, 2019 (London, UK)	Check website

Current Issues in Behavioral Economics: From Theory to Applications	May 17, 2019 (Madrid, Spain)	Check website
Behavioural Economics and the Modern Economy	June 10 - 14, 2019 (London, UK)	Check website
Summer Institute on Bounded Rationality	June 11 - 19, 2019 (Berlin, Germany)	Annual
Rethinking Marketing and Insights: Behavioral Economics Immersion	June 18 - 20, 2019 (New Haven, CT)	Check website
PSE Summer School on Bounded Rationality and Behavioral Economics *	June 24 - 28, 2019 (Paris, France)	Check website
Workshop on Behavioral Economics and Computation *	June 28, 2019 (Phoenix, AZ)	Check website
Prague Summer School on Behavioral Economics and Psychology *	June 29 - July 6, 2019 (Prague, Czech Republic)	Check website

briq Summer School in Behavioral Economics *	July 8 - 12, 2019 (Bonn, Germany)	Check website
CEBEX Summer School on Behavioral Sciences	July 19 - 27, 2019 (Prague, Czech Republic)	Check website
Sydney Workshop on Experimental Economics and Theory *	July 25-26, 2019 (Sydney, Australia)	Check website
Executive Program in Behavioral Economics	July 29 - August 2, 2019 (Pittsburgh, PA)	Check website

Crash Course in Experimental Economics	August 19 - 24, 2019 (Amsterdam, Netherlands)	Check website
Behavioural Science in Practice	September 9 - 11, 2019 (London, UK)	Check website
Research Transparency and Reproducibility Training	September 11 - 13, 2019 (Washington, DC)	Check website
Bridges/CAGE Summer School on Behavioural Economics *	September 12 - 13, 2019 (Venice, Italy)	Check website
Network for Integrated Behavioural Science Workshop *	September 18 - 20, 2019 (Coventry, UK)	Annual
Behavioral Economics Bootcamp	October 4 - December 8, 2019	Check website
Behavioral Science in Business: Understanding People to Drive Results	October 15 - 17, 2019 (New York, NY)	Check website
Applied Behavioural Economics Workshop	October 18, 2019 (London, UK)	Check website

Meetups

Action Design DC	Washington, DC	Check website
Amsterdam Behavioural Science Network	Amsterdam, Netherlands	Check website
Behavior Design AMS	Amsterdam, Netherlands	Check website
Behavior MN	Minneapolis, MN	Check website
Behavioral Economics Madrid	Madrid, Spain	Check website
Behavioral Economics NYC	New York, NY	Check website
Behavioral Grooves Cape Town	Cape Town, South Africa	Check website
Behavioral Grooves Meetup	Minneapolis, MN	Check website
Behavioral Science Berlin	Berlin, Germany	Check website
Behavioral Science Enthusiasts SF	San Francisco, CA	Check website
Behavioural Economics, Neuroscience Psychology and Marketing	Dublin, Ireland	Check website
Behavioural Insights Community - Scotland	Glasgow, UK	Check website
Brussels Behavioral Economics Meetup	Brussels, Belgium	Check website

BsB-EConomics - Meetup de Economia Comportamental	Brasilia, Brazil	Monthly
DC's Behavioral Economics Fellows	Washington, DC	Check website
Geneva Behavioral Economics Network	Geneva, Switzerland	Check website
London Behavioural Economics Network	London, UK	Bimonthly
New Delhi Behavioural Meetup	New Delhi, India	Check website
Pune Behavioral Science Meetup	Pune, India	Check website,
Sydney Behavioural Economics & Behavioural Science Meetup	Sydney, Australia	Check website,
Vienna Behavioral Economics Network	Vienna, Austria	Check website
Zurich Behavioral Economics Network	Zurich, Switzerland	Bimonthly

Other Resources

For the most up-to-date behavioral science resources, including events, jobs, popular books, and scholarly journals, please visit

behavioraleconomics.com

APPENDIX

Author Profiles

Alain Samson (Editor)

Alain Samson is the editor of the Behavioral Economics Guide, founder of behavioraleconomics.com and Chief Science Officer at Syntoniq. In the past, he has worked as a consultant, researcher and scientific advisor. His experience spans multiple sectors, including finance, consumer goods, media, higher education, energy and government.

Alain studied at UC Berkeley, the University of Michigan and the London School of Economics, where he obtained a PhD in Social Psychology. His scholarly interests have been eclectic, including culture and cognition, social perception, consumer psychology and behavioral economics. He has published articles in scholarly journals in the fields of management, consumer behavior and economic psychology. He is the author of Consumed, a *Psychology Today* online popular science column about behavioral science.

Alain can be contacted at alain@behavioraleconomics.com.

Uri Gneezy (Introduction)

Uri Gneezy is the Epstein/Atkinson Endowed Chair in Behavioral Economics at the Rady School of Management, UC San Diego. His early work on when and why incentives can backfire has become the cornerstone in a compelling line of research that explores when traditional economic theories fail to explain real human behavior. His research focuses on putting behavioral economics to work in the real world, where theory can meet application. As part of this, he works with companies to implement new incentives to employees and customers. His scientific work was published in top Economics, as well as general interest journals. Uri is the co-author of the bestseller book *The Why Axis*, and is currently working on a new book on incentives.

Gneezy received a PhD in Economics from Tilburg University, and a BA in Economics from Tel Aviv University. He was a faculty member at the University of Chicago, the Technion and the University of Haifa.

Nina Mažar (Guest editorial)

Nina Mažar is Professor of Marketing and Co-Director of the Susilo Institute for Ethics in the Global Economy at Questrom School of Business at Boston University. She is also the co-founder of BEworks.

Nina, who is currently the president of the Society for Judgment and Decision Making, was named one of 'The 40 Most Outstanding B-School Profs Under 40 In The World'. With her focus on behavioral economics she investigates the implication of human biases on welfare, development, and policy. Her research topics range from donations to financial decision making to morality. She uses various approaches from large scale field experiments to controlled, incentive compatible behavioral lab studies to neuroscience methods. Popular accounts of her work have appeared among others on NPR, BBC, in the New York Times, Wired, Harvard Business Review, and various New York Times Bestsellers as well as in the documentary feature film *The Honest Truth about Dishonesty*.

Nina serves as behavioral economics advisor on boards of various government and non-for-profit and profit organizations (e.g., Irrational Labs in San Francisco, CA). She was previously a post-doctoral associate and lecturer in marketing at MIT Sloan School of Management and the MIT Media Lab (Dan Ariely's eRationality Group). She holds a PhD in Marketing from the University of Mainz in Germany. Her website is www.ninamazar.com.

Contributing Organizations

Aalto Capital Group

Aalto Capital Group advises SMEs and private equity funds on all aspects regarding financing, mergers & acquisitions and capital market solutions. The cornerstones of Aalto Capital's business philosophy are longevity in client relationships and a thorough understanding of each client's unique needs combined with unquestioned trust in every occasion. As a wide range of financing options offered on the market might appear indistinct and inscrutable, Aalto Capital's expertise and experience helps clients in finding the solution that satisfies their individual needs. Aalto Capital's geographical reach and partner network covers Europe, Russia, Asia, Middle-East and US, with local presence in New York, London, Munich, Helsinki, and Stockholm.

For more information, please visit www.aaltocapital.com.

Aboab & Co

Aboab & Co is a Saudi-born strategic advisory, established in the spring of 2010 in response to a growing need to deliver locally relevant, pragmatic strategies built to be immediately actionable. Over the years, Aboab & Co has continuously built on its operating model to ensure it is able to deliver value into an ever-changing region.

The advisory extends its services over six key disciplines; research and insight, strategic communications, behavioral insights, impact assessment, and implementation oversight. The firm engages in turnkey solutions from the initial fact finding research, to strategy, to implementation and ultimately assessment. Each vertical is built to operate as a standalone product or as part of a larger initiative, covering multiple disciplines.

Aboab currently has three offices in the Kingdom of Saudi Arabia, with a satellite presence in both the United Kingdom and the United Arab Emirates.

For more information, please visit www.aboab.com.

Affective Advisory

Affective Advisory is a Swiss advisory boutique specializing in behavioral science. We use the latest academic insights from experimental economics, social psychology and cognitive science to design revolutionary strategies for customer, employee and citizen engagement.

We support leading corporate, government and non-profit organizations in innovation and change management, organizational culture and development as well as marketing and communication projects, focusing throughout on human judgement and decision making.

We are locally rooted and globally connected. Based in Zurich, Switzerland, we draw on a global network of professional and academic experts with diverse industry experience to deliver the best possible solutions for our clients.

For more information, please visit www.affective-advisory.com.

Behave4

Behave4 applies the latest methods for understanding people's behavior within the framework of behavioral economics and provides organizations with scientific-based solutions.

We're pioneers in the application of economic games for measuring people's behavior in a work environment, which allows companies to make better data-driven decisions and optimize their recruitment, HIPOs detection, and assessment processes.

We're locally rooted, but with an international vocation. Based on Granada, Spain, thanks to our digital platform and professional team, we serve our clients wherever they are.

For more information, please visit: www.behave4.com.

Behavior & Law

Behavior & Law is a Spanish company dedicated to research, scientific dissemination and teaching in behavioral sciences and forensic sciences. Since its foundation in 2008, it has specialized in the application of these sciences to the field of public and private security.

In the area of public security, it has stood out for its collaboration with police forces from different countries (Mexico, Colombia, Ecuador, USA, etc.), obtaining various national and international acknowledgements. Regarding private security, it has stood out for the creation of the SAVE meta-protocol for fraud management, a method for training teams within private companies to fight internal and external forms of fraud. In recent years, large insurance and financial companies have been trained in this method.

For the last two years, Behavior & Law has been intensifying its work in behavioral economics, currently focusing on several lines of research, one of them within the collaboration with the Welfare Economics group of the UNED. Our latest project is an App for smartphones that will incorporate several economic decision-making games and cross the results with personality questionnaires that will be administrated to its users.

For more information, please visit www.behaviorandlaw.com.

Behavioral Science Lab

We are decision scientists serving the next generation of change makers.

We are the only lab in the world that can honestly say that we redefine the way our clients look, identify and understand their customers. It's no longer about B2B or B2C, it is about H2H. Through unparalleled proprietary technologies and predictive behavioral economic models,

we not only create transformative growth for our clients, but also a new way of creating true human-to-human conversation.

For more information, please visit www.behavioralsciencelab.com.

BP&E Global

BP&E Global is a specialist independent provider of board governance, evaluation, and regulatory consultancy, primarily in the financial services sector. Our support ranges from board evaluations, governance reviews, consultation on matters of governance, regulation and board member selection, to leadership development and regulated conduct issues, including executive coaching and programmes that embed conduct-aware working.

We do not undertake "board work" as an adjunct to our main business; it *is* our business. For that reason our people pay close attention to developments in regulation and the law as well as to how behavioural and attitudinal techniques impact board effectiveness. Most of us are former regulators, and many qualified in various psychological disciplines, including executive coaching, behavioural science and regulatory design.

For more information, please visit www.bpandeglobal.com.

BVA Nudge Unit

The BVA Nudge Unit is a global consultancy, pioneering in providing practical and applicable behavioral science-based interventions that are beneficial to people, organizations and society. Expert consultants provide services in change management, leadership and decision making, diversity and inclusion, employee engagement, space planning, safety at work, health & public policy, product and services design, communication and training. The company has offices and consultants in the US, Europe, Asia and Latin America.

The BVA Nudge Unit has helped clients achieve behavioral change, with more than 120 interventions and engagements across multiple verticals: health, transportation, energy, consumer products, telecom, banking, finance, insurance and real estate. Clients of the BVA Nudge Unit have included the UN Women's HeforShe movement, the political campaign of Emmanuel Macron and many Fortune 100 companies.

Founded in 2013, BVA Nudge Unit is part of the BVA Group, one of the top 15 market research and consultancy firms in the world.

For more information, please visit www.bvanudgeunit.com.

Decision Technology

With roots in academia and close links to various research institutions, Decision Technology specialises in helping businesses and policymakers understand and manage customer decision-making with insight grounded in behavioural science and psychology.

We deliver highly differentiated insight and end-to-end services that merge financial analysis and business advice alongside field research and customer insight. This hybrid approach, developed with our co-founder Professor Nick Chater of Warwick Business School, marries a necessary focus on commercial results with a practical understanding of what drives human behaviour.

Decision Technology is a trusted advisor to some of the world's largest organisations in both the private and public sectors. We build long-term partnerships with our clients, whose markets span telecoms, utilities, retail, advertising, and finance. By employing a behavioural, experimental and statistical approach, our Brand practice helps our clients to navigate and leverage the relationship between customer decision-making and winning strategies.

For more information, please visit www.dectech.co.uk.

Influence At Work

Influence At Work is headed by two of the world's most recognised names in the world of behaviour science and practice – Robert Cialdini and Steve Martin. We work with organisations all over the world offering consultancy, running field experiments, delivering training and helping companies to build their own in-house behavioral science capability.

In addition to our UK and US bases we now have offices in France and Australia.

Our international bestselling books have sold over 4 million copies and our popular YouTube *Science of Persuasion* video has been viewed over 11 million times. Our research and insights have been rated as 'Breakthrough Ideas for Business' by the Harvard Business Review, are taught on executive programmes in business schools around the world and have attracted the interest of world leaders, policy makers, senior executives and business professionals.

For more information, please visit www.influenceatwork.co.uk.

ING

ING is a global financial institution with a strong European base, offering banking services through its operating company ING Bank. The purpose of ING Bank is empowering people to stay a step ahead in life and in business. ING Bank's more than 52,000 employees offer retail and wholesale banking services to customers in over 40 countries.

Group Research supports ING's purpose by monitoring and applying lessons from behavioural science to personal finance through the open-access THINK platform and the ING International

Survey. It is also a key supporter of the Think Forward Initiative. The consumer content on THINK explores how attitudes to money affect our lives, now and in the future. The ING International Survey is one of the biggest surveys of its type in Europe and delivers a better understanding of how people spend, save, invest and feel about money. The Think Forward Initiative is a multi-year movement bringing together experts representing governments, academics, consumers, and the financial and technology sectors with the aim of developing tools that can help people make conscious and informed choices about money.

For more information, please visit think.ing.com/consumer.

Irrational Labs

Irrational Labs is a behavioral product design firm that helps companies and nonprofits leverage behavioral economics to design and test interventions that increase the health, wealth and happiness of their users.

Irrational Labs has worked with Google, the World Bank, Intuit, Lyft, Fidelity, Aetna, and dozens of other companies to change behavior for the better.

The team puts on a 9-week immersive Bootcamp for product managers, designers, and marketers. It's designed to help attendees learn and apply behavioral economics in order to build products that change behavior for good. Attendees walk away with the expertise to bring this discipline to their organization in a scalable and ethical way.

For more information, please visit www.irrationallabs.org.

Panthera Solutions

Panthera Solutions Sarl. is a Monaco-based consultancy, specialized in optimizing the investment decision architecture for professional investors.

Applied Behavioral Finance: As independent applied behavioral finance experts, our consulting and training empowers professional investors to make more rational investment decisions within an aligned choice architecture.

Proprietary Research: Our sound proprietary research and methodologies contain applicable solutions for balancing heuristics management and quantitative techniques.

Bespoke Solutions for Empowerment: Our bespoke contribution results in a more skilled investment decision, empowering the decision maker to reach defined investment objectives and to develop a competitive edge.

Innovation Leader: We are a team of internationally renowned specialists in different asset management fields. Our assignments and publications have proven us to be innovation leaders in Europe.

For more information, please visit www.panthera.mc.