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INTRODUCTION BY JOHN LIST

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INTRODUCTION

The Voltage Effect in Behavioral Economics

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All happy families are alike; each unhappy family is unhappy in its own way.

-Leo Tolstoy, *Anna Karenina.*

For decades, a school district in the upper Midwest of the US has been struggling with kindergarten readiness.[1] Administrators have tried a long list of solutions with little success, leaving the District Superintendent, Greta, at her wit's end. A new member of the school board, and a devoted follower of behavioral economics (BE), Mason, recently read an article about an early education behavioral intervention with impressive results: peer-reviewed by academic experts, the study showed large treatment effects on several school readiness indicators. At the end-of-the-year school board meeting, while others discussed the district's woes, Mason brought up the idea of implementing a similar BE program, a potential silver bullet to address the district's pervasive issues with kindergarten readiness. The benefit-cost ratio was astronomical, he assured Greta and the rest of school board. Armed with the science and associated statistical jargon that few could understand, the school board chose to trust Mason and adopt the BE program to scale in their district.

That fall, the school district began to introduce the program, rolling it out in an experimental fashion so that officials could credibly isolate its impacts and prove its benefits to the community. At every fish fry and rotary club meeting they attended, Greta and Mason mentioned the BE program, being sure to mention that economic thinkers as far removed as Adam Smith, Herbert Simon, Gary Becker, Daniel Kahneman, and Dick Thaler produced BE ideas. Just wait until these students apply to college—our first Harvard matriculants are coming soon, Mason boasted at the Lion's Club pancake breakfast. After one year, the results arrived. Mason and Greta pored over the costs, benefits, and outcomes, as measured by standardized cognitive and behavioral tests.

The results: unequivocally mediocre. "The BE program does not even pass a benefit cost test, much less yield the silver bullet that was promised by the original study results. I guess the science got it wrong this time; those BE results didn't scale," Mason concluded.

But *did* the science get it wrong?

I believe that the science likely had it right but that the original results were overinterpreted. The program that Greta and Mason tried to replicate could never carry the water that they had hoped. Indeed, most of us think that scalable ideas have some 'silver bullet' feature, i.e., some quality that bestows a 'can't miss' appeal. That kind of thinking is fundamentally wrong. There is no single quality that distinguishes ideas that have the potential to succeed at scale with those that do not do so. In this manner, moving from an initial research study to one that will have an attractive benefit cost profile at scale is much more complex than most imagine.

And, in most cases, scaling produces a *voltage drop*—the original BE insights lose considerable voltage when scaled. The problem, *ex ante*, is determining whether (and why) that voltage drop will occur. When scaling ideas, one can look to Tolstoy for a bit of wisdom, because in my travels I have learned that *all successfully scaled ideas are alike; all unsuccessfully scaled ideas fail in their own way.* What this lesson inherently means is that scaling, in the end, is a weakest link problem: the endeavor is only as strong as the weakest link in the chain. However, via theory and empirical work, various colleagues and I (see, e.g., Al-Ubaydli & List, 2013; Al-Ubaydli

[1] This Greta and Mason opening passage leans heavily on Al-Ubaydli et al. (2020b). As noted there, except for the names and a few other changes, this is a true story.

et al., 2017a,b; 2020a,b; 2021; Supplee et al., 2021) find that there are five specific traits that scalable ideas must possess—what I call the 'BIG5'. These are the five 'key signatures' of ideas that scale. A deficiency in any one can render an idea unscalable, even for the most ingenious among us.

How We Got Here

Before immersing ourselves in the details of the BIG5, it is useful to step back. To start, it is important to note that BE and field experiments have contributed immensely to the "credibility revolution" of the last three decades in the social sciences (see Harrison & List, 2004). In this way, field experiments have become a useful tool for providing causal estimates that are difficult to obtain using other approaches. Yet, since the early 1990s, field experiments have focused primarily on testing BE theories, uncovering BE mechanisms, and estimating program effects. This represented a logical first step, as experimentalists sought to provide deeper empirical insights and theoretical tests as part of the credibility revolution of the 1990s.

Nevertheless, what has been lacking is a scientific understanding of how to make optimal use of the scientific insights generated for policy purposes. I denote this as the 'scale-up' problem, which revolves around several important questions, such as: do the BE insights we find in the petri dish scale to larger markets and settings? When we scale the BE intervention to broader and larger populations, should we expect the same level of efficacy that we observed in the small-scale setting? If not, then what are the important threats to scalability? What can the researcher do from the beginning of their scholarly pursuit to ensure eventual scalability?

Providing answers to such questions is necessary, because understanding when—and how—our BE insights scale to the broader population is critical to ensuring a robust relationship between scientific research and policymaking. Without such an understanding, empirical research can quickly be undermined in the eyes of the policymaker, the broader public, and the scientific community itself. Indeed, in modern economies the chain connecting initial research discovery to the ultimate policy enacted has as its most susceptible link an understanding of the science of how to use science for policy purposes.

As mentioned previously, several colleagues and I have put together a series of studies that both theoretically and empirically explore these questions. Our research advocates flipping the traditional model, calling on scholars to place themselves in the shoes of the people whom they are trying to influence. Our general call is for policy research that starts by imagining what a successful intervention would look like fully implemented in the field, applied to the entire subject population, sustained over a long period of time, and working as expected, because its mechanisms are understood. To accomplish this goal, our original experimental designs must provide insights along five key dimensions, to ensure that we are actually scaling ideas and polices that have a chance to make a deep impact, or at least keep the promise of their initial results.

Introducing the BIG5

These needs can be broken down into what I call the BIG5. First is the inference problem: how much evidence should be gathered before scaling? I advocate that a post-study probability of at least 0.95 is achieved before enacting public policies (see Maniadis et al., 2014).[2] In practice, this amounts to three or four well-powered independent replications of the original finding. In the case of Greta and Mason, perhaps the original BE results they read about were simply a false positive. A first truth about false positives is that they can be considered 'lies' or 'false alarms'. These are cases whereby, due to statistical error, there was never any voltage in the first place. At the most basic level, a false positive occurs when you interpret some piece of evidence or data as proof that something is true when in fact it is not so. For example, when I visited a high-tech plant in China that produced headsets, if a headset working properly was marked as defective due to human error, that was a false positive. Unfortunately, false

[2] Formally, post-study probability is defined as the share of true associations which are declared true divided by the share of all associations which are declared true.

positives are ubiquitous across contexts; in a forthcoming book titled *The Voltage Effect* (List, 2022), I summarize findings that suggest a wealth of policies and ideas that fail to scale are simply the result of false positives.

The second element of the BIG5 is representativeness of the population. Often, this is the result of failing to know your audience—or assuming that the small subset of people for whom the idea worked originally are representative of the general population that needs to be served, so that when you expand your idea it falls short for a broader set of people. Following the vignette above, in the original study, the researcher might have gathered a sample of students that was much different than the students Greta and Mason had in their district. Greta's school district might have had students with much different characteristics, including observables such as demographics and educational background that did not match the original study. In addition, the original researcher might have reached a population of students that minimized participation costs, or perhaps a population that had characteristics that might yield a larger treatment effect (a 'let's give the idea its best shot of working' recruiting strategy). A medical example of this type of selection effect can be found in meta-studies of recruitment, which confirm that those who stand to benefit most from a medical treatment are more likely to participate in trials (see Al-Ubaydli et al., 2020a). Such selection effects might yield a good journal publication and future grant funding, but it portends a voltage drop at scale as the program is rolled out to everyone.

In a nutshell, researcher choice/bias, selection bias/sorting of the study's population into the program, non-random attrition, and (dis)economies of scale in participation costs all affect the representativeness of the population studied, which in turn might affect the promise of scaling (see Bell & Stuart, 2016).

Third is the representativeness of the situation. A subtle fact is that the research and policy communities oftentimes generalize results to both a population of situations and a population of people, even though we often only speak of the latter. This is particularly troubling considering that the data, thus far, suggest that representativeness of the situation is much more important than representativeness of the population when it comes to generalizing or scaling (see, e.g., List, 2007). For instance, when Greta's school district scaled up the BE program, they did it within their infrastructure, which might have been entirely different from that of the original study, in that certain logistical constraints were present that affected the roll out. If the original results are dependent on the specific context, or they are not done in a policy relevant environment, we can expect the benefit-cost profile to change at scale.

For example, consider Head Start home-visiting services, an early childhood intervention that found significant improvements in multiple child and parent outcomes in the original research study (Paulsell et. al, 2010). However, variation in the quality of home visits was found on a larger scale, with home visits for 'at risk' families involving more distractions and less time on child-focused activities, thereby diminishing program effectiveness and increasing attrition (Al-Ubaydli et al., 2020a). In this case, the voltage effect likely occurred because the scaled program did not include the fundamental core components that made the initial intervention promising.

The implementation literature sometimes calls this 'context-dependence'. Likewise, in conjunction with curriculum specialists, the original researcher created a curriculum for a pre-kindergarten program, trained the teachers, and provided hands-on support throughout the process. When the school district scaled up the program, they might not have used the exact same curriculum and care as the original implementation, due to local constraints. This is often described as 'program drift' in the literature. This third reason behind voltage effects is generally caused by not understanding that the initial success depended on unscalable ingredients—unique circumstances that cannot be replicated at scale.

A fourth key aspect pertains to spillovers (network effects) and general equilibrium effects of scaling. Concerning the midwestern school district, spillovers could be negative from the treated group to the control group. While the intervention improves

the school performance of students in a given class, the control group may, upon seeing an initial improvement in the performance of the treated group, feel demoralized, inducing a deterioration in their performance, accentuating the measured treatment effect (psychologists denote this effect as "resentful demoralization"). Of course, the effect could run in the opposite direction.

Related to spillovers are what economists call *general equilibrium effects*, a term describing shifts in an overall market or system that likely do not manifest on a small scale. To illustrate this notion, let's say that I conducted an experiment wherein I randomly chose 100 college sophomores, forced half of them to change their major to Economics, then examined how much they were earning in their first job compared to the 50 students who did not change majors. I would likely find the Economics majors doing quite well. Now, instead, let's say that I had 50% of all college sophomores around the world change their major to Economics and the other 50% constituted the control group. What would happen a few years later when they all entered the workforce? Assuming no sudden spike in employer demand for Economics majors, a large influx of new economists on the market (increased supply) would cause their wages to plummet: a huge voltage drop.

Here is the rub: our BE experiments typically give us answers along the lines of a small-scale experiment; they don't speak to large movements, such as everyone, or even 50% of college sophomores changing majors. Yet, in a very real sense, this is exactly what we want to know before we scale, especially in the policy world: what are the total effects of my idea in a world where *everyone* changes and *anything and everything* else can change? Ideas do not exist in petri dishes. And an innovation can have negative consequences that are at odds with its purpose but *only become visible at scale.*

Representativeness of the population and the situation as potential threats to scalability underline how fundamental it is to understand 'sites' (i.e., the environment where the original research was implemented) to address the scale-up problem. The literature treats 'sites' loosely whereby some disciplines focus on the population of sites while others emphasize the situational characteristics. I define 'sites' as having multi-dimensional characteristics, which our theory guides into population and situational categories. It is, thus, critical for researchers to describe comprehensively the environment in which the research is carried out, going beyond a cursory description. In this spirit, I advocate that original researchers should stratify (block) on situations when doing experiments, just like we commonly stratify on individual characteristics in modern experimentation (for example, we typically are sure to include both women and men in treatment and control groups, and we do so by stratification; we should do the same for potential non-negotiables in our programs, such as the actual human's delivering, correct dosage, program, delivery, incentives, substitutes, etc.).

Finally, we consider marginal cost considerations. This fifth element of the BIG5 represents the 'supply-side economics' of scaling—does your idea have economies or diseconomies of scale? Greta needed high-quality teachers to run the BE program she was attempting to scale. While the original study only needed 10 teachers, Greta needed 100 for her school district. There was just one problem: the best teachers are also very expensive to retain and hire in the first place. In this case, teachers are very difficult to scale while retaining a reasonable budget. As you 'buy'" more of them at scale, the price invariably goes up, unlike the wholesale price of lettuce going down for Costco when it buys thousands of heads for its locations every week. Indeed, the opposite happens: teachers become more expensive. This is because to attract more high-quality people into the teaching profession, you must raise the teacher salary in order to compete with employers that might pay them more, such as a Wall Street bank or a Silicon Valley tech company.

This key element calls on the analyst to not only measure benefits and how they might scale, but also carefully consider the cost side. This is typically not discussed in the literature, but an idea that has economies of scale is much more likely to scale effectively than one with severe diseconomies of scale. The cost side of the equation just cannot be ignored, and benefit-cost profiles should be computed not only in the petri dish but also at scale.

So Where Does This Leave Us?

After you clear these BIG5 hurdles, you will know that you have an idea that scales. More generally, while our running example pertained to a public policy, I do not view these insights as limited to helping policymakers. By highlighting the key potential economic sources threatening the scalability of programs and bringing them to the attention of researchers, I hope that those preparing to conduct new studies might consider modifying their own designs such that their reported treatment effect estimates more accurately inform what is likely to occur, should the program be scaled. In this way, as mentioned above, the new demand on scholars is that we backward induct when setting up our original research plan, to ensure accurate and swift transference of programs to scale with minimal uncertainty.

Yet, after the BIG5 are cleared, we are not done. When the program is actually scaled, the correct empirical approach should be taken to measure efficacy, and continuous measurement should be a priority. The first best approach to estimating the effects of the program at scale is to do a large-scale RCT. One can then compare these estimates with the results from the original studies, to explore efficacy at scale. If this approach is untenable, then it is critical to adopt an empirical approach that allows stakeholders to measure its efficacy without unrealistic assumptions. While an exhaustive summary of such approaches is beyond the scope of our work, I point the interested reader to List (2007), who discusses various empirical approaches to policy evaluation as an empirical spectrum, which includes examples of econometric models that make necessary assumptions to identify treatment effects from naturally occurring data. Some of these approaches, such as interrupted time series designs or regression discontinuity analysis, can get pretty close to addressing the internal validity that RCTs solve.

In closing, scaling of ideas is not a silver bullet problem. This is because *all successfully scaled ideas are alike; all unsuccessfully scaled ideas fail in their own way.* I have documented five key reasons why most (if not all) policies and ideas fail to scale. Find an idea that failed to scale, and it will revolve around one or several deficiencies associated with the BIG5. Find ideas that do scale, and they will each be devoid of the BIG5. My work showcases that moving from evidence-based policy to policy-based evidence forces the researcher to backward induct from what a successful idea or policy looks like at scale and test those features in the petri dish.

> Nearly every problem has been solved by someone, somewhere. The frustration is that we can't seem to replicate [those solutions] anywhere else.
>
> –President Bill Clinton.

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EDITORIAL

Behavioral Economics: Promoting Diversity, Equity, and Inclusion Through Goal-Setting

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The COVID-19 pandemic and the #MeToo and Black Lives Matter movements have exposed deep structural inequities in the United States and around the world. Achieving diversity, equity, and inclusion (DEI) has become a core concern for many organizations. This requires behavior change and trade-offs between the short-term costs and long-term benefits associated with DEI. In this editorial, we discuss organizational DEI goals as an evidence-based tool that can address both the *will* (motivation) and the *way* (cognition, skills, and tools) of behavior change. Goals generate the *will* to change, because they involve accountability; induce personal pride and public recognition; convey social norms; induce competitiveness; and work in tandem with other motivational mechanisms, such as financial incentives and feedback. Goals help us tap into the necessary *ways* to change by focusing attention; prompting effort; inducing persistence; and mobilizing specific, relevant strategies to reach the target. Fundamentally, we argue that organizations should manage DEI the same way they manage all their other business imperatives: through performance goals with deadlines and rewards, underpinned by monitoring and reporting. Reaching DEI goals requires no more and no less than the use of the same planning, feedback, and accountability processes that are employed to achieve goals in other areas.

Introduction: The Will and the Way of Behavior Change

The enormous changes in the world due to the COVID-19 pandemic, apparent inequities within countries (exemplified in the U.S. and many other countries by the #MeToo and Black Lives Matter movements), and other structural changes induced by technology and globalization are forcing organizations to reimagine how work gets done and, more fundamentally, what the workplace of tomorrow should look like. The so-called "Great Reset" has made it painfully clear that organizations have not kept up with the dramatic changes in how and where we work and in the demographic composition of the labor force. A larger and more diverse workforce has helped produce growth and innovation, but it can only reach its potential if organizations overcome the systemic inequities that hold back women, people of color, and other underrepresented groups. Thus, identifying evidence-based, effective ways for organizations to advance diversity, equity, and inclusion (DEI) is more critical than ever.

Making DEI a reality in organizations requires changing the way we behave. By default, humans tend to be more comfortable with others who look like them and prefer people who conform to their stereotypical beliefs. We expect engineers to be men and nurses to be women,[1] and if confronted with a different picture, we tend to respond with confusion or hostility. We experience costs from being exposed to difference, and such costs often need to

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[1] We acknowledge that the concept of gender is complex and does not exist on a binary notion, and that biological sex as assigned at birth and gender or gender identity are distinct. Nonetheless, today's academic research and popular literature on goals and targets still generally exist on the woman-man gender binary, because this is how most data are collected. As such, this editorial examines gender in the binary context.

be counterbalanced by benefits, in order for us to be willing to change.

What makes this even trickier is that the costs tend to be experienced immediately, while the benefits tend to accrue in the future, once the DEI work has been done: diverse teams do not outperform homogenous ones immediately but have the potential to do so in the long run (Phillips, 2014). We frequently face these types of intertemporal choices—like how much to save for retirement or whether to exercise today—that require us to weigh costs and benefits occurring at different times (Ericson & Laibson, 2019). In such cases, humans consistently fall prey to cognitive biases and make suboptimal choices (Bohnet, 2016).

We conceptualize DEI in organizations as one such intertemporal choice problem. It has short-term costs, including the discomfort resulting from difference and a perception that DEI could be a zero-sum game where those currently in power could only lose by being more inclusive. Besides, organizational practices and procedures need to be changed, which means additional costs today. But DEI may also have important long-term benefits for both individuals and organizations, including more creative problem-solving on teams, more objective decision-making, and greater fairness, with the latter increasingly demanded by investors, regulators, customers, and employees (Page, 2007).

The question, then, is: How can organizations make smarter trade-offs between the short and long term when it comes to DEI?

We argue that behavior change requires transformation along two key dimensions that individuals and organizations can influence: the *will* and the *way*. The will reflects our desire, or motivation, to act (Wiltermuth & Gino, 2013). The way reflects our means to execute: the knowledge, resources, and tools we draw on to act given the constraints—situational, cultural, temporal, financial—we face (Berkman, 2018). Therefore, to generate lasting behavior change, it is imperative to address the will and the way by tackling both the motivational and cognitive challenges associated with new behaviors.

A case in point is the public reporting of diversity data, which has not meaningfully moved the needle on gender diversity in the technology sector (Chilazi & Bohnet, 2020). In 2014, top U.S. tech companies led by Apple, Facebook, Google, and Microsoft started releasing annual diversity reports, detailing their workforce composition—at a high level, and using idiosyncratic metrics selected by each company—by gender and race. The reports invariably revealed workforces that were overwhelmingly white, Asian, and male-dominated, especially in technical jobs. And progress has been scant: the share of women in tech jobs grew from 15-20% in 2014 to 20-23% in 2019 at Apple, Facebook, Google, and Microsoft (Harrison, 2019). While the data are useful in illuminating the problem and garnering attention—after all, what does not get measured does not count—the numbers alone do not seem powerful enough to increase the *will* to change DEI-relevant behaviors and identify the *way* by which such change could happen.

Thankfully, the behavioral scientist's toolbox offers us another powerful mechanism to drive DEI behavior change: goals and targets.

Goals and Targets: What Do We Know?

What Are Goals?

A goal is at once an outcome that one aims for—and one that may not "otherwise happen without some kind of intervention" (Berkman, 2018)—as well as a standard for determining performance or judging satisfaction (Locke & Latham, 2002). A diversity goal, in particular, is an "organizational objective to increase demographic heterogeneity" along a particular dimension of diversity such as gender or race (Heilman & Welle, 2006). Goal-setting, then, is the process by which individuals and organizations determine the outcomes that they want to achieve, as well as the associated timeframes (Barends et al., 2016). Indeed, research has shown goals to be effective in generating positive outcomes in contexts as varied as medicine, health and fitness, negotiations, job searches, learning, and training, with time spans ranging from one minute to 25 years, and subjects ranging from individuals to groups and organizational units (Locke & Latham, 1990).

Typically, two key types of goals are distinguished:

behavior (or process) goals, which are defined in terms of specific behaviors such as interviewing at least one person of color for every open position, and outcome goals, which are defined in terms of accomplishments such as hiring 50% women for all entry-level roles (Epton et al., 2017). Whereas outcome goals motivate people to put their existing knowledge, resources, and tools to work on a task, process goals motivate them to develop their task-related abilities by acquiring new knowledge, resources, and tools (Barends et al., 2016). Both types of goals lead to behavior change, although correlational data suggest that outcome goals are more closely related to outcomes than behaviors, and vice versa (Harkin et al., 2016). Relatedly, learning goals focus on the skills or competencies to be developed, while performance goals focus on the attainment of a specific level of performance (Locke & Latham, 2002). For instance, a DEI-related performance goal would be to reach a particular employee engagement score on an annual survey, while a learning goal would be to discover a certain number of new strategies to help boost employee engagement scores.

How and Why Do Goals Work?

Goals have the potential to be a powerful tool for DEI-related behavior change, because they address both the *will* (motivation) and the *way* (cognition, skills, and tools) of behavior change. Moreover, goals are an intervention at the level of both the individual or organization (the decision-maker) and the context (the environment), and research on long-term behavior change suggests that the most successful approaches deploy both of these strategies concurrently (Duckworth & Milkman, 2018). For the decision-maker, goals serve to amplify the value of goal-related behaviors, reduce the value of goal-unrelated behaviors, or do both at the same time (Berkman, 2018). As for the environment, goals act as a situational nudge[2] by making beneficial behaviors more rewarding (since people are inherently motivated to achieve goals), more salient and memorable, and easier by enabling people to process information more appropriately (Duckworth & Milkman, 2018).

Goals help motivate us toward particular behaviors by generating the *will* to do them. Below, we offer five categories of mechanisms for this effect:

1. **Goals involve accountability:** Accountability, i.e., the implicit or explicit expectation that one might be required to justify one's actions to others, increases the cost of failure, and thus motivation, since no one wants to appear foolish or failing in the eyes of others (Lerner & Tetlock, 1999). One form of accountability is the comply-or-explain approach, which acts as a 'soft default', in that it introduces a reference point that people generally dislike deviating from, even though they retain the freedom to do so. This approach has been used in the UK, Australia, and many other countries to drive behavior change in areas including women's representation on corporate boards, companies' diversity policies, and corporate governance (Bohnet, 2016).
2. **Goals can induce personal pride and public recognition:** Goals make behavior change attractive by introducing an element of personal pride (intrinsic motivation) and public recognition (extrinsic motivation) as a result of accomplishing them. This, in turn, increases commitment to the goals, which is essential for goal-setting to work: if managers doubt their ability to reach assigned goals, or fundamentally do not accept the premise of the goals, they are less likely to remain committed to achieving them (Whelan & Wood, 2012).
3. **Goals may convey social norms:** Goals can communicate social norms and thereby lead to herding, where people and organizations imitate others' behavior, because what they are doing is seen as 'the (socially acceptable) thing to do'. DEI goals can thus shift perceptions of desirable behaviors and outcomes, which is, in itself, a powerful in-

[2] 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 fruit at eye level counts as a nudge. Banning junk food does not" (Thaler & Sunstein, 2008).

fluence on behavior.

4. **Goals can induce competitiveness:** Humans tend to be competitive and driven to compare themselves against others whose characteristics or circumstances are relevant to theirs. Such social comparisons can have long-lasting positive effects on behavior, such as in the context of energy consumption, where alerting consumers to the consumption habits of their neighbors has been shown to induce competitiveness and lead to a sustained reduction in their own energy usage (Allcott & Rogers, 2012; Duckworth & Milkman, 2018).
5. **Goals can be coupled with other motivational mechanisms:** While goals are inherently motivating, their effects can be magnified by deploying them in tandem with other motivational mechanisms or behavior change techniques. In fact, interventions that combine goal-setting with plan-making, feedback, progress monitoring, and commitment devices result in greater behavior change than goal-setting alone (Baca-Motes et al., 2013; Harkin et al., 2016).

Goals affect performance by helping us summon the necessary *ways* to achieve them. Below, we offer four categories of mechanisms for this effect (Locke & Latham, 2002):

1. **Goals focus attention (direction):** Goals focus our cognitive and behavioral attention on key activities that will enable us to reach them (goal-relevant activities), and, by extension, away from other activities (goal-irrelevant activities). For example, people who were given feedback on multiple aspects of their driving improved their performance only on those aspects for which they had previously set goals.
2. **Goals prompt effort (energy):** Goals energize us to expend (physical and/or cognitive) effort to reach them by serving as a reminder of what we want to achieve. In other words, people are inherently driven to achieve goals, with high goals prompting more effort than low ones.
3. **Goals are a commitment device (persistence):** Commitment devices have two key features: people voluntarily choose to use them, and they attach consequences to people's noncompliance (Rogers et al., 2014). As such, goals are inherently a commitment device, making people more likely to stick with a task—provided that they come with some kind of accountability mechanism (we discuss this below). Indeed, targeted commitment to a specific action rather than a more general principle—for example, reusing hotel towels specifically as opposed to practicing environmentally friendly behavior generally—was shown to drive meaningful behavior change, even though people were less likely to voluntarily take on such targeted commitments compared to general ones (Baca-Motes et al., 2013).
4. **Goals mobilize relevant strategies (resourcefulness):** Goals spur us to tap into and/or discover goal-relevant knowledge and strategies. When faced with a goal, we draw on our past experiences, existing knowledge and expertise, or external help in order to reach it. As such, goals mobilize relevant strategies like plan-making and progress monitoring, which in turn help us to achieve them.

Goals and targets, which are aspirational and voluntary, are distinct from quotas, which are mandatory requirements for the specific representation of certain groups in designated positions. Quotas are typically imposed and enforced by a legislative or regulatory body that also has the power to deploy sanctions in case of failure or non-compliance (Whelan & Wood, 2012). For example, political quotas that randomly assigned a third of village chief positions to women in India successfully increased the share of women in local government from 5% in 1993 to 40% in 2005, and served to improve attitudes towards women as legislators, as well as community outcomes for women and girls (Pande & Ford, 2011). While this editorial focuses on DEI goals that are set at the organizational level, rather than quotas, research evidence on the impacts of quotas can offer important insights about the effectiveness of goals, which have thus far been less extensively studied in the DEI realm.

In economics, the discussion of quotas has centered on the question of whether they help to induct more qualified people—who otherwise would not have applied or been selected—into target posi-

tions, or whether they "lower the bar" and thereby result in inferior performance. Real-world evidence in favor of the former hypothesis comes from Norway, where a 2003 law mandating a minimum representation of 40% of both women and men on the boards of publicly listed limited liability companies accomplished its representational goal while also narrowing the gender pay gap among board directors; importantly, the women appointed to boards after the introduction of the quota tended to be observably more qualified than their female predecessors (Bertrand et al., 2017). Similarly, laboratory experiments have shown that in a setting where high-performing women failed to enter competitions, introducing a gender quota increased their willingness to compete (Niederle et al., 2013).

In sum, goals work to increase task performance and promote behavior change, because they simultaneously address the *will* and the *way* of behavior change, and may improve outcomes if they enable qualified people who were previously discriminated against to enter the playing field and contribute. Furthermore, compared to quotas, goals have the advantage of being able to be set and tracked at the organizational level, without externally-imposed consequences for underperformance.

Unintended Consequences

In her BE Guide 2019 editorial, Nina Mažar discussed the importance of unintended consequences generally, and like any organizational policy, goals can have unintended consequences. A goal *backfires* when it has the opposite of the intended effect. For example, a multinational company's diversity goal's singular aim could be to increase the representation of people from outside its home market—say, Germany—in leadership positions, but their number decreases instead. If the presence of the goal causes German colleagues to resent non-Germans in the company—an undesirable effect on a variable, i.e., cross-cultural relations that the goal did not set out to influence—that entails *negative spillover*. Finally, if the goal results in apparent change without real underlying progress—such as if it leads to more non-Germans having leadership-level titles without the accompanying scope of responsibilities—there is *false progress* (Temkin & Itembu, 2020). Monitoring both goal-related and (seemingly) goal-unrelated data closely will allow organizations to spot quickly signs of any of these three unintended consequences.

While goals are distinct from quotas, research on the effects of the latter raises important considerations for organizations contemplating DEI goals, especially because DEI quotas have thus far been studied more extensively than DEI goals. The evidence shows that quotas influence policy outcomes and increase women's leadership across a variety of contexts, but they can also engender *backlash*, especially in the corporate sphere where companies have been shown to occasionally try to strategically circumvent the intended impacts of quotas (Pande & Ford, 2011). Gender quotas have also been shown to subject women to sabotage (by both male and especially female peers) as part of peer review processes in competitive environments (Leibbrandt et al., 2018). Moreover, their impact is context-dependent: quotas increase average effort and wages in discriminatory environments where women are disadvantaged in the selection process and yet equally suited to become managers, but they do the opposite in non-discriminatory environments where women are not initially disadvantaged. Approval for gender quotas is similarly context-dependent and—in accordance with meritocratic principles—higher in settings where women are disadvantaged in career advancement, notwithstanding possible gender differences in performance (Ip et al., 2020).

If organizational diversity goals—or quotas—are perceived to advantage one group at the expense of another, they can be rejected on grounds of unfairness, especially in (perceived) zero-sum contexts. Even if DEI efforts are actually designed to level a playing field that was previously unfairly disadvantaging, for example women, if men perceive women's increased representation as a threat to their current standing in the workplace, they are unlikely to buy into goals designed to increase diversity, equity, and inclusion (Bohnet, 2016). Such zero-sum perceptions can be persistent, even in the face of evidence to the contrary. For instance, a recent study showed that in settings with diversity goals in

place, high-potential women who had the ability to reach the top levels of organizations were perceived as more valuable than high-potential men; however, while these women received pay premiums as a result, they were still out-earned by men overall, due to the female wage penalty. Even explicit diversity goals did not "afford widespread advantages to undeserving women" (Leslie et al., 2017).

Finally, organizations also need to look out for another potential downside of goals, which is *tunnel vision*. In other words, what does not get measured, does not count, and vice versa. For instance, focusing exclusively on numerical diversity goals (i.e., attaining specific levels of representation) can lead individuals and organizations to neglect other important considerations, such as the quality of the employees and the organizational climate. Similarly, focusing only on the composition of the hiring pool—like the U.S. National Football League does with its Rooney Rule, which requires teams to interview but not necessarily select racial minority candidates for head coach positions—can in fact lead to a reduction in the probability of hiring diverse candidates if evaluation processes are not adjusted (Fershtman & Pavan, in press). It is also possible that focusing on DEI efforts targeted at one specific demographic group, such as women, may lead organizations to focus less on efforts targeted at other groups, such as people of color.

The take-home lesson is that the design and implementation of a system of goals and targets matters greatly for its eventual success. In organizations, some representational goals instituted by leadership—especially when tied to compensation—may be perceived more like quotas by those affected by them, making this lesson particularly relevant (Whelan & Wood, 2012). How goals are set and framed makes a big difference, and we discuss this further below.

Setting and Achieving DEI Goals

In order to promote diversity, equity, and inclusion more effectively, organizations should set DEI goals that are specific, measurable, realistic yet stretching, and time-bound. The basis for these goals should be a thorough, data-driven analysis of the organization's current DEI state. Just as a doctor first diagnoses the causes of an illness before prescribing the appropriate medicine, so too should organizations first use workforce analytics to understand their DEI pain points before setting goals to address them. By necessity, DEI goals will be highly contextual. For example, at the BBC, where journalists seek to portray accurately a world that is gender-balanced, it was realistic and purposeful to set a goal of having women and men equally represented in all aspects of their journalism through *50:50 The Equality Project* (Rattan et al., 2019). Similarly, when the UK set out to increase women's representation on FTSE 100 corporate boards in 2011, it set a target of reaching 25% representation in four years, considering that it was starting from a baseline of 12.5% ("The Davies Review," n.d.). When that initial goal was reached ahead of schedule, the target was revised to 33% women on FTSE 350 boards by the end of 2020—another milestone that was reached ahead of schedule ("Targets & Progress," n.d.).

Achieving DEI goals will require organizations to tap into well-established behavioral strategies that can help enhance both the *will* and the *way* to reach the goals. Accountability, monitoring and transparency, and reporting are key strategies to increase organizational and individual *will* to achieve DEI goals, whereas choice architecture is an important strategy to operationalize the *ways* to change.

Accountability (*will*). Research shows that tasking specific people (such as a Chief D&I Officer or a departmental diversity manager) or entities (such as a diversity taskforce) with accomplishing diversity goals makes those goals more likely to be achieved; on the flipside, research also shows that goals are more likely to be abandoned when no one is in charge of them (Castilla, 2015). Besides, this type of organizational accountability for goal attainment is a powerful tool to mitigate backlash against DEI goals (Dobbin et al., 2015). Cross-functional diversity taskforces and committees may be particularly beneficial in this regard, because they bring together people from different parts of the organization to pursue a collective goal (Kalev et al., 2006). Another promising organizational accountability mechanism is social networks: since humans loathe neg-

ative social consequences (such as disappointing colleagues or letting down a whole department in a company-wide competition), they can be leveraged as a source of interpersonal and public accountability (Rogers et al., 2014). In the case of the UK's board diversification efforts, company chairmen served as an accountability mechanism for each other, pushing their peers for progress. They were aided by external accountability from the media and the UK government, which were actively monitoring progress (Beshears et al., 2017).

Importantly, true accountability means that there are consequences for not meeting the specified goals. These consequences could be monetary (such as missing out on a bonus); reputational (such as having your performance compared against that of your peers on a public dashboard, scorecard, or report); relational (such as being asked to explain your poor performance in front of your managers); or punitive (such as being removed from a leadership position). Depending on the accountability structure, these consequences could fall on an individual, on a team, or on the whole organization. In any case, organizations need to ensure that a focus on the accountability for *meeting DEI goals* does not overshadow the focus on i*mproving diversity, equity,* and *inclusion itself* (Temkin & Itembu, 2020).

Monitoring and transparency (*will*). Documenting progress has been shown to motivate people toward goal attainment. The focus of progress monitoring influences what gets done: monitoring specific behaviors has the greatest impact on those behaviors, whereas monitoring outcomes has a significant impact on those outcomes (Harkin et al., 2016; Kruglanski et al., 2011). Public monitoring, where information on progress is generated either with or in front of others (such as managers sharing with each other the number of women and men they are promoting on their teams, or making that information available on a dashboard), has a greater positive effect on goal attainment than private progress monitoring (Harkin et al., 2016). Research also shows that transparency works to reduce bias in organizational processes such as promotions and compensation decisions, in part because of social accountability or our desire to look good and fair-minded in the eyes of others (Dobbin & Kalev, 2016). For example, when a company's biased pay raises were disclosed internally along with performance ratings, the gender and racial gaps in raises essentially disappeared (Castilla, 2015). Similarly, *50:50 The Equality Project* shares all participating teams' monthly data on a transparent internal dashboard, which allows for comparison and friendly competition between them (Chilazi et al., 2020).

Progress against goals should be monitored as frequently as is feasible. People closer to goal-related action (such as hiring) will often be able to monitor progress more or less in real time as hires are made, whereas people further removed from those actions (such as HR executives) may monitor progress slightly less frequently. At least one person in the organization should always have a granular, real-time view of how the organization is tracking against its goals (such as holding a running tally of hires by gender against a goal of having all hires be 50-50 women and men). That person can then share monthly, quarterly, semi-annual, or annual progress updates with others. Empirical data suggest that tech companies that review their workforce diversity data at least once per month have a higher representation of women than companies that review it less frequently, with effects being particularly pronounced on the entry-level representation of women ("Top Companies for Women," 2019). In any case, progress should be monitored at least every six months, both in aggregate and by relevant subdivisions, such as by level or function ("Setting and Achieving Diversity Targets," 2017).

Reporting (*will*). Disclosing DEI data, especially alongside related DEI goals, is important to facilitate learning, as evidenced by the successful examples of both *50:50 The Equality Project* and the UK's board diversification efforts. Goals set publicly were shown in a recent meta-analysis to be particularly effective at driving behavior change (Epton et al., 2017). Simply put, goals need to be visible to be viable, and a public (i.e., external to the organization) commitment makes it more likely that they will be achieved (Galinsky et al., 2015). While we cannot make causal inferences, Fortune 100 companies that report DEI data and set goals have been shown to outperform the full population of large compa-

nies significantly in terms of female and ethnic/racial minority representation in leadership (Motel, 2016). Public tracking of progress against DEI goals also sends a signal internally and externally that the company is serious about them. Organizations should not only report their demographic data and related goals, but also share learnings about which strategies have been successful and unsuccessful in promoting DEI, and what their impact has been on culture and performance aside from mere representational numbers (Whelan & Wood, 2012).

Choice architecture (*way*). Redesigning decision-making contexts to mitigate the negative impacts of biases and inadequate motivation can help facilitate behavior change and goal attainment. At their core, behavioral design tools guide people toward decisions that are better aligned with their interests, without taking away freedom of choice (Thaler & Sunstein, 2008). Organizations may consider:

- **Plan-making.** Making a concrete plan about how, when, and where one will complete a desired action helps mitigate procrastination and forgetfulness (Soll et al., 2016). Specifically, making so-called 'if-then' plans regarding intended behaviors (e.g., "If I am confronted with an all-white slate of candidates, then I will ask recruiters to send me more options before making a hiring decision") notably increases follow-through, on both a one-off and a sustained basis. Individuals, teams, departments, and whole organizations should create specific plans detailing how they will achieve their DEI goals, and what strategies they will deploy to overcome anticipated setbacks (Barends et al., 2016).
- **Feedback.** Feedback provides a valuable yardstick for evaluating whether one's current efforts lead to acceptable, goal-aligned performance. It is impossible for people to adjust their effort and behavior without knowing how they are tracking against the target (Locke & Latham, 2002). While self-evaluation was initially theorized to motivate people to perform better, the latest research suggests that it is actually external sources of feedback and assessment, such as supervisor evaluation, that exert a greater effect on behavior change (Barends et al., 2016).[3]
- **Support mechanisms.** Support mechanisms like checklists, reminders, and scorecards are effective in promoting goal achievement for both individuals and teams, because they mitigate the effects of forgetfulness and cognitive biases while ensuring that decisions are given appropriate attention (Beshears & Gino, 2015).
- **Defaults.** Advancement opportunities, such as stretch assignments and promotions, typically require employees to raise their hands actively by self-nominating (i.e., by opting in). However, evidence is emerging that such systems, which default to no participation on the part of employees, contribute to gender gaps observed in leadership positions, and that opt-out systems reduce these gaps. A straightforward example involves considering everyone for promotion after a set time in a particular role. Given that even high-performing women are empirically less likely to opt in and put themselves forward for advancement opportunities, opt-out advancement mechanisms can help enlist eminently qualified women for higher-level positions and close the gender gap in leadership (Erkal et al., 2019). This could entail, for example, automatically considering everyone at a certain level for promotion instead of relying on self- or manager nominations, or defaulting all leaders to receive career advancement support such as coaching and leadership training.
- **Active choice.** As an alternative to opt-in or opt-out schemes, active choice mechanisms force decision-makers to select one option or another, instead of accepting a default. The benefit of active choice mechanisms is that they induce reflection and more thoughtful decision-making, which can lead to less bias in the decision-making process (Soll et al., 2016). In the context of DEI, an example is a promotion process that asks every employee

[3] This is not a unanimous finding in the research literature, as one recent meta-analysis suggests that feedback and reviewing goals do not actually boost the effects of goal-setting, although the authors note that this lack of effect could be due to the small number of studies reviewed (Epton et al., 2017).

to indicate whether they want to be considered for promotion in that round.

- **Evaluation criteria.** Selecting decision criteria in advance—whether for hiring, promotion, compensation, or other DEI-related decisions—has been shown in several studies to lead to more objective and unbiased decisions (Norton et al., 2004; Uhlmann & Cohen, 2015). If assessment criteria are not specified ahead of time, people tend to select candidates who are similar to them, or to the prototype, regardless of qualifications. Evaluation criteria should be reviewed regularly to ensure that they do not generate disparate outcomes (Galinsky et al., 2015).

Conclusion

Making meaningful progress on creating diverse and inclusive organizations will require the use of the same tools that have already proven successful in changing human behavior in other contexts. Through goals, behavioral economics provides organizations with an important evidence-based way to address both the *will* and the *way* of behavior change, thereby allowing them to promote diversity, equity, and inclusion more effectively. For practitioners, this high-level process is as straightforward as setting goals, selecting the metrics by which to track them, and holding people accountable for achieving them (Hirsh & Tomaskovic-Devey, 2020). In many organizations, managers are already assigned some types of business-related performance targets—sales goals, customer acquisition targets, deadlines by which to launch new products, budgets to manage—which affect their rewards and for which they are personally accountable. DEI goals need not be any different.

Broader implementation of goals as a tool to promote DEI holds great promise, especially since progress has traditionally been slow in the DEI field and goals have the potential to change this issue. Nonetheless, many open questions remain regarding DEI goals, and we encourage additional research in this area. Future work should look into questions such as what specific types of goals (process vs. outcome; learning vs. performance) are most effective in the DEI context; how may the effects of goals differ depending on the DEI dimension (e.g., gender, race, or nationality) and the existing context (e.g., very low vs. relatively high current representation of the target group); and will goals set for a particular dimension of diversity (e.g., gender) crowd out efforts in other areas (e.g., racial diversity)?

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APPLICATIONS

Behavioral Insights and Gender-Based Violence Prevention: Evidence From a Facebook Trial in Honduras

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Globally, one out of three women experiences physical and/or sexual violence at some point in their lives. Evidence on what works to prevent gender-based violence (GBV) is still scarce, particularly in the field of behavioral science. This paper discusses the Behavioral Insights Team's and Inter-American Development Bank's work to prevent GBV, and the results of an online randomized controlled trial (N= 829,445) promoting early help-seeking among survivors in Honduras. The results suggest that Facebook ads that address sunk cost bias and uncertainty aversion can effectively encourage women to seek help online. This trial illustrates three core aspects of a behavioral approach to developing GBV prevention policy: (1) drawing on evidence, (2) developing a behavioral map for barriers to key behaviors among specific actors, and (3) tailoring interventions grounded in context. We hope to apply this approach to interventions with different actors, in order to contribute to GBV prevention.

Introduction

Globally, one out of three women experiences physical and/or sexual violence at some point in their lives, the majority at the hands of an intimate partner (World Health Organization, 2013). Evidence on what works to address gender-based violence (GBV)[1] is still scarce, particularly when it comes to the contributions of behavioral science: most of the available evidence has been derived from studies carried out in high-income countries, and it primarily provides insights related to response, rather than prevention (Ellsberg et al., 2015).

Although a range of institutional, cultural and societal factors influence the prevalence of GBV in a given context, behavioral science may prove a particularly suitable method for addressing this challenge, as it relies on a context- and people-led approach to devising solutions. As such, the first step towards addressing GBV through behavioral science is to approach it not as an entrenched, intractable problem but as an aggregate of behaviors by different actors, each occurring under specific circumstances.

The COVID-19 pandemic has posed a particular challenge for GBV prevention. During times of hardship and crisis, such as the COVID-19 lockdowns and associated economic pressures, GBV is likely to increase. In Honduras, for example, in April and May 2020, 18,284 women reported being victims of

[1] Gender-based violence (GBV) is physical, psychological, or sexual violence perpetrated against an individual or a group on the basis of gender or gender norms.

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GBV according to data from 911 calls, an increase of 9% compared to reports from April and May 2019.[2] Researchers have found similar trends after other crises, such as the 2008 financial crisis (Schneider et al., 2016), Hurricane Harvey (Serrata & Alvarado, 2019), and Hurricane Katrina (Schumacher, 2010).

The national lockdown in Honduras during the COVID-19 pandemic meant that many women found themselves quarantined with an aggressor, or that already tense relationships became further strained as some families struggled to meet basic needs or had to rebalance household roles and responsibilities.

In 2019, the Behavioral Insights Team (BIT) and the Inter-American Development Bank (IDB) produced a report, Applying Behavioral Insights To Intimate Partner Violence,[3] to provide policymakers in Latin America with recommendations on how behavioral science could improve existing services for survivors. In 2020, we pivoted our program of work to encourage early help-seeking through online platforms in Central America, which survivors could safely access during lockdown restrictions. We conducted four randomized controlled trials (RCTs) in Honduras and El Salvador, and we are currently collaborating in two more (as of April 2021).

In this paper, we present a summary of some of the work BIT has done over the past few years to apply behavioral science to address GBV, drawing insights from targeted interventions while maintaining a systematic approach to violence prevention.

We focus in particular on an RCT that BIT conducted in Honduras in partnership with IDB to encourage survivors to seek help. We also discuss policy implications and a research agenda for future work (Rafael Almeida et al., 2016; Alexander-Scott et al., 2016; Garnelo et al., 2019).

Behavioral Science and Gender-Based Violence: Key Actors Within the Social Ecology

GBV is not a single, entrenched problem but an aggregate of behaviors and factors pertaining to different actors within specific contexts (Heise, 2011; Heise, 2015; Heise & Manji, 2015). By applying a behavioral lens to GBV, we seek to understand which factors (personal, cognitive, environmental, institutional) influence decision-making, in order to design evidence-based, targeted interventions that can prevent and decrease GBV. Our work to date has mostly focused on: 1) encouraging bystanders to intervene in situations of GBV and 2) promoting early help-seeking behaviors among survivors of violence.

Interventions With Bystanders

Strategies for violence prevention involving bystanders assume that members of the community have the power to sanction or legitimize acts of violence. A bystander can be anyone—a colleague, a neighbor, an acquaintance, or a passerby. Bystanders must go through a complex decision-making process in order to intervene in a case of GBV (Latané & Darley, 1968). They must first notice that an event is occurring, interpret it as an emergency, assume a level of responsibility to act, choose a form of assistance, and, finally, take action.

Research suggests that working with the community and bystanders to violence can be a very effective channel for reducing GBV (Fenton, 2016). Bystanders can create new norms for intervention, as well as foster a sense of community responsibility and competence. For example, in Bangladesh, BIT collaborated with BRAC University to place posters in buses that addressed barriers to bystander intervention and provided timely nudges to passengers (BIT-BRAC, 2021). These posters effectively improved attitudes towards victims of sexual harassment. Similarly, BIT worked with universities in Australia and Peru to promote bystander intervention and prevent sexual harassment among college students. By using the bystander intervention model to address the behavioral barriers faced by students,

[2] Data provided by the 911 in Honduras. In April and May 2019, there were 16,775 domestic violence reports made to the 911 hotline in Honduras.

[3] https://publications.iadb.org/publications/english/document/Applying_Behavioral_Insights_to_Intimate_Partner_Violence_Improving_Services_for_Survivors_in_Latin_America_and_the_Caribbean_en.pdf

we achieved successful results (BIT, 2019).

Interventions With Survivors of Violence

Our work with survivors has focused on recognizing warning signs, promoting early help-seeking, and encouraging safety planning. Since 2018, we have been developing a program of work in Honduras and El Salvador aimed at developing and testing interventions to address high levels of GBV and encourage survivors to seek help early.

In order to understand better the barriers to seeking help, and to develop interventions in response to these barriers, we conducted qualitative research in El Salvador with survivors, the Women's Institute ISDEMU,[4] and staff from Ciudad Mujer centers—one-stop centers providing government services for women, including health care, child care, and violence responses.[5]

Based on our qualitative findings, we conceptualized the help-seeking process and its barriers in three stages (Liang et al., 2005):

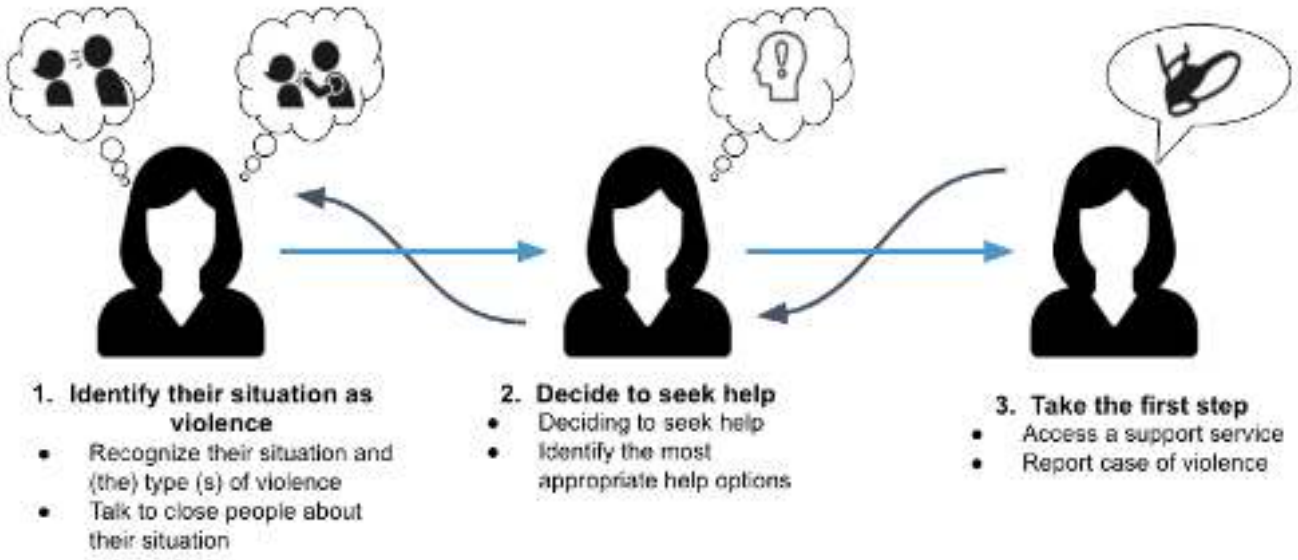

Figure 1: A model of the help-seeking process.

In the first stage, women **identify their situation as violence**. Through our fieldwork, we identified critical barriers that prevent women from identifying their situation as violence, including:

- **Stigma** of being perceived as a 'victim of violence'. This stigma prevents many women from acknowledging the situation of violence they experience. In our fieldwork, we found that women associate the word *victim* and *violence* with negative traits, so they neither want to be associated with these words nor be seen entering the violence attention service module in Ciudad Mujer.
- **Moral licensing** is a phenomenon in which people make allowances for "bad" behaviors because of other "good behaviors" (Simbrunner & Schlegelmilch, 2017). In the context of GBV, women may make allowances for violent behaviors because their partner is, for example, a good father, friend, or financial provider, is well-respected in the community, or is a loving partner at other times.

[4] Isdemu web page.

[5] Although the fieldwork was conducted in El Salvador, we validated the relevance of our qualitative findings with key stakeholders in Honduras (high-level officials and field staff from the INAM and Ciudad Mujer).

In the second phase, women **decide to seek help**, as well as what kind of help they will seek, and when and how to take the first step. Critical barriers include:

- **Lack of self-efficacy** and disempowerment to change their current situation. Toxic or violent relationships often erode women's sense of self-efficacy (that is, their belief in their ability to complete tasks, achieve goals, and overcome obstacles (Bandura, 1977)). Even after identifying their situation as violence, women may feel like there is nothing they can do to change their situation.
- **Sunk costs.** 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). Evidence from our qualitative analysis shows that some women stay with their aggressors because of the previous effort they invested in the relationship.

Finally, women **take the first step** towards accessing the support services available and disclose the fact that they have been subject to violence. Critical barriers include:

- **Uncertainty aversion.** We tend to prefer known risks to unknown risks (Ellsberg, 1961). When making the mental leap between the intention to seek help and the action of doing so, survivors face a high level of ambiguity. Women may feel worried not only about what will happen to them and their families in the long term, but also about the details of the help-seeking process.
- **Lack of safety plans** in case of danger. Safety planning is used to help advocates and women talk through strategies that would increase safety in given scenarios. When women make plans in case of emergencies, they are much more likely to follow through and successfully escape risky situations.

Applying Behavioral Insights to Encourage Help-Seeking Behaviors in Honduras

In Honduras, 27.5% of women aged 15-49 have experienced at least one act of physical violence since they were 15 years old. Additionally, 22% of women who have ever been in an intimate partner relationship have experienced some form of violence from a partner during the past 12 months. However, only 20% of these women sought support from any institutional service (e.g., the police, the courts, the Institute of Women).[6]

Given that seeking help at an early stage is crucial to breaking the cycle of violence (Garnelo, 2019), and taking into consideration mobility restrictions under COVID-19, BIT and IDB developed an experiment with the aim of encouraging early help-seeking behavior through online platforms among GBV survivors in Honduras.

The Intervention

We collaborated with the National Institute of Women and the Ciudad Mujer communications team to design four Facebook ads looking to address the barriers identified during our qualitative research and encourage help-seeking. We describe the four ads in detail, below.

A. Combat availability bias

Identified barrier: *Availability bias* is the tendency to estimate the frequency or magnitude of events or behaviors based on how easily they come to mind (Tversky & Kahneman, 1974). The media most commonly portrays GBV as physical violence (e.g., women covered in bruises). For victims of other forms of abuse, this may be alienating and prevent them from realizing that they are experiencing abuse, or even from seeking help.

Solution design: *Image portraying different forms of violence that are less commonly depicted (psycho-*

[5] The figure was 27% according to the National Demographic and Health Survey 2011-2012. (The most recent ENDESA was taken in 2019, yet its results are not publicly available).

logical, economic, control)(Figure 2). The first step in the help-seeking journey is recognizing that violence is occurring. Therefore, the image that we developed to address this barrier portrayed various forms of violence.

B. Debunk sunk costs

Identified barrier: The *sunk cost fallacy* can affect women in abusive relationships: the more effort and time a woman has invested in achieving a harmonious relationship, the less likely she is to leave.

Solution design: *Image of a woman who has been successful in seeking help sharing this outcome with others* (Figure 3). To overcome this barrier, we showed women what their lives could be like if they sought help, allowing them to imagine a better future in which they have the potential to gain, not

Figure 2: Availability bias.

just lose, from ending an abusive relationship.

C. Reduce uncertainty aversion

Identified barrier: *Uncertainty aversion* (Ellsberg, 1961; Berger et al., 2013). Women in situations of violence are often uncertain what will happen if they decide to seek help, and this can stop them from taking action.

Solution design: *Image portraying the outcome of help-seeking (a woman on the phone receiving assistance*) (Figure 4). The image aimed to clarify and demystify the help-seeking process. It clearly portrayed who was on the other end of the line (not

Figure 3: Sunk costs and counterfactual thinking.

Figure 4: Uncertainty aversion.

Figure 5: Action-intention gap and safety planning.

a male police officer but a trained operator) and explicitly assured anonymity and confidentiality for the caller. The image aimed to convey that the caller had agency over what happened after their help-seeking call.

D. Addressing the action-intention gap portraying a safety plan

Identified barrier: The *intention-action gap* refers to the idea that people do not always do the things that they intend to do, because they either fail to get started or get derailed along the way. People sometimes fail to follow through on their intentions, because they procrastinate (e.g., putting off calling a help center), they miss the opportunity to act (e.g., failing to call the helpline when they have a moment alone), or they have second thoughts at a critical moment (e.g., deciding against leaving an unhealthy relationship at the last moment) (Gollwitzer, 1999).

Solution design: *Image of safety plan milestones* (Figure 5). Behavioral science literature has shown that people are more likely to follow through on their intentions if they plan their actions in advance (Belanger-Gravel et al., 2011). The image that we developed to address the intention-action gap aimed to help women make these plans by providing a checklist of the key decisions (safety plan) they must make when planning to leave a violent relationship.

The Trial

We ran a five-arm RCT on Facebook, in which we randomly assigned individual women Facebook users[7] to see one of the four ads presented.

A fifth control group was assigned to see a slightly

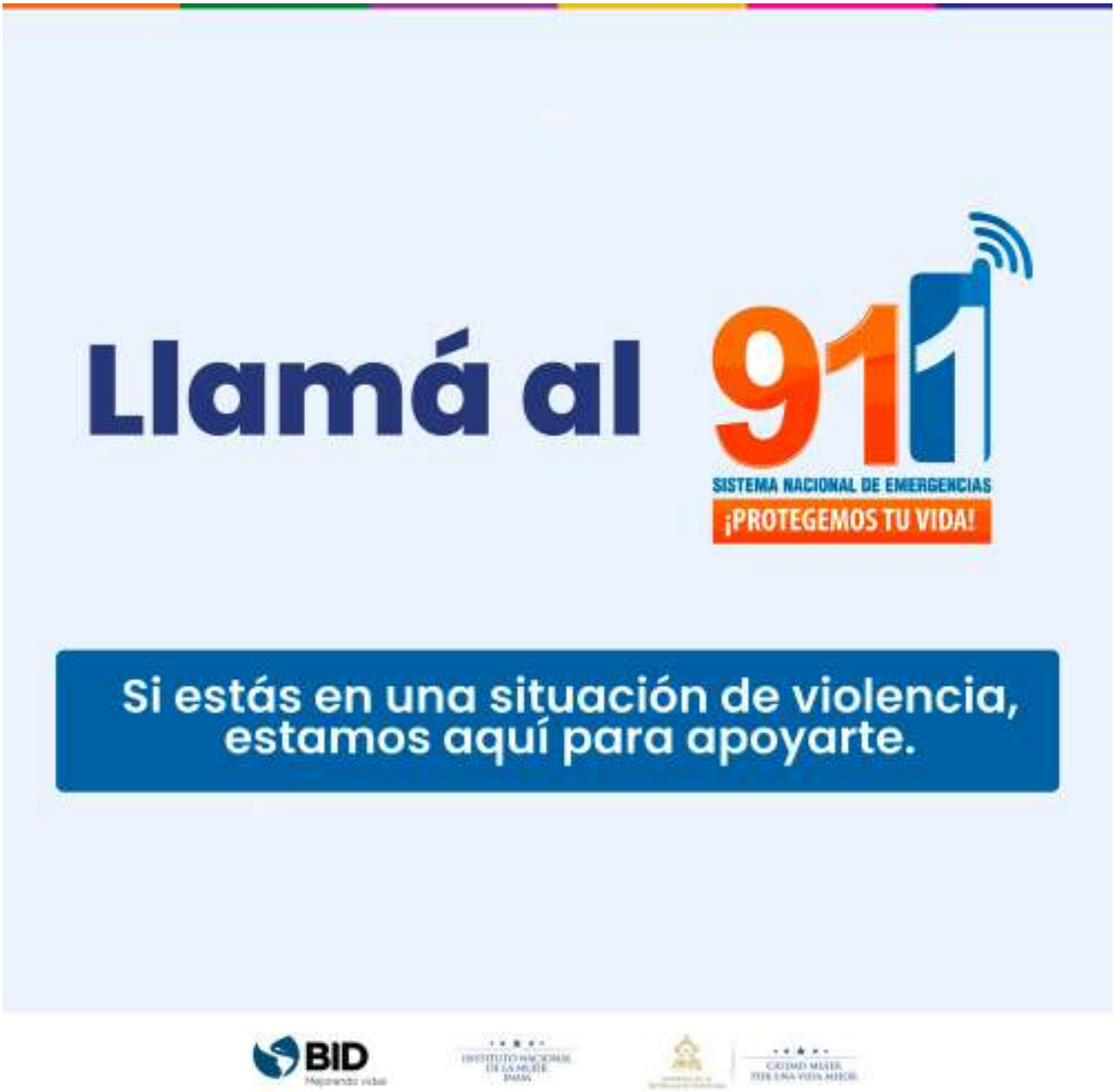

Figure 6: Control image.

modified version of the business-as-usual government image, which provided information on support services for survivors. To differentiate the control image from the behavioral strategies that we include, we intentionally avoided adding narrative graphics. We included a call to action (call 911) and added an explanatory message below, to provide full information to survivors in the control group. We automated the randomization process, using the A/B testing function in Facebook's Experiments platform.

The trial ran from August 22 to September 19, 2020. Our sample consisted of 829,445 women—around ~165,000 in each trial arm.[8] We measured

[7] Our sample included users who: (1) lived in Honduras, (2) self-identified as a woman, (3) were 18-65 years old, and (4) spoke Spanish as their primary language.

[8] On Facebook, this metric is called 'Reach' and is an estimate based on the number of people who were exposed to one of our ads at least once.

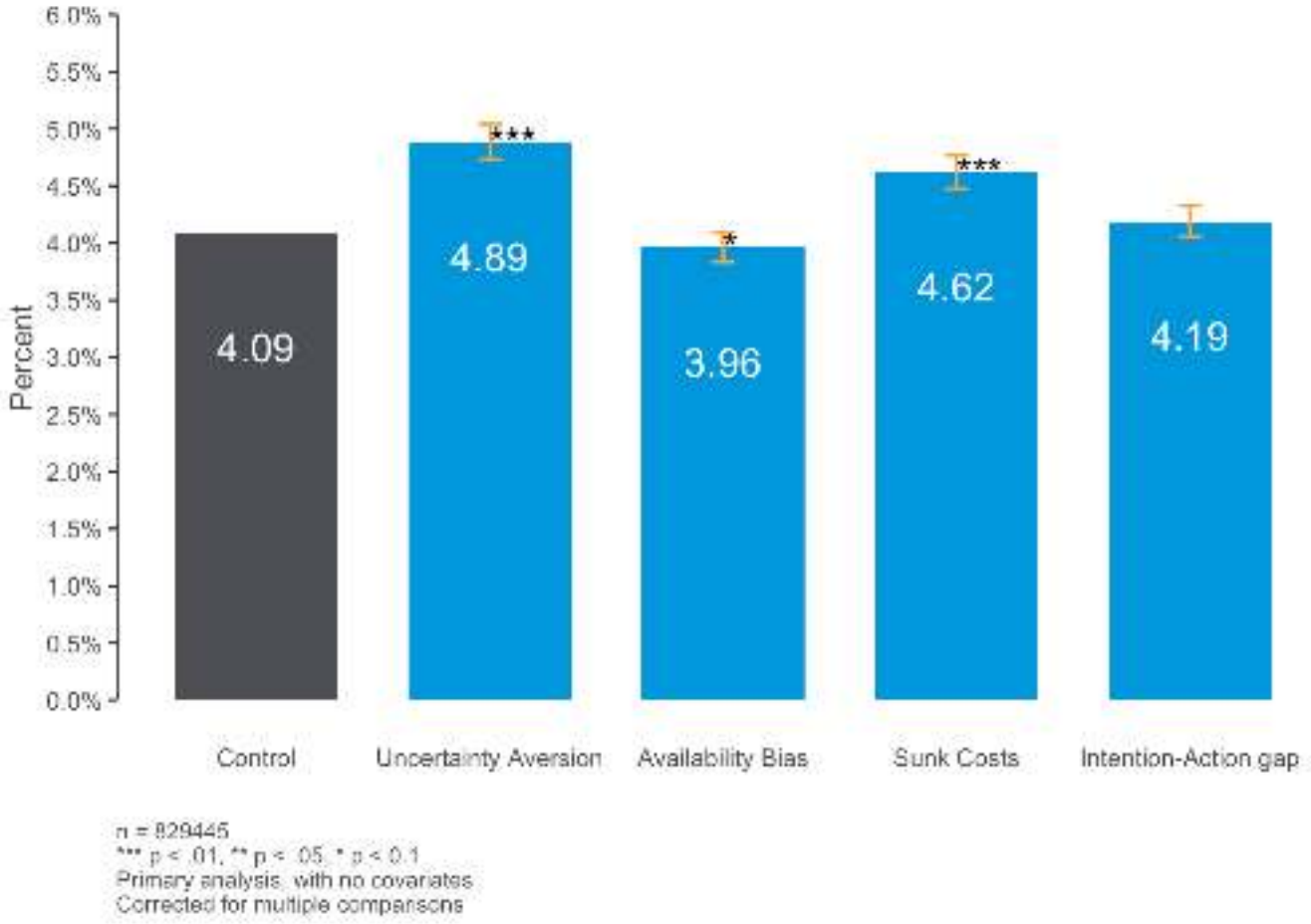

Figure 7: Treatment effects on entering the Ciudad Mujer website.

effects on online help-seeking behavior, which we defined as a woman interacting with the Ciudad Mujer webpage. Specifically, we recorded (1) if a woman clicked on the Facebook Ad, taking her to the Ciudad Mujer website, and (2) if after navigating to the Ciudad Mujer webpage, a woman then clicked on any of the contact channels for Ciudad Mujer: WhatsApp, email, Facebook, LinkedIn, or Twitter.

Results

We used a logistic regression to test the effects of the different messages.

Primary results: Treatment effect on contacting Ciudad Mujer

We found positive and significant results from two of our trial arms on help-seeking behavior, as measured by the likelihood of users clicking a link on the Facebook ads that directed them to the Ciudad Mujer website and loading the page.[9]

Women who were exposed to the image addressing uncertainty aversion were 19.4% more likely to visit the Ciudad Mujer page than women in the control group, while those exposed to the image addressing sunk costs were 12.9% more likely to visit the Ciudad Mujer page than others in the control group (both results statistically significant at the 1% level). Furthermore, the images addressing uncertainty aversion and sunk costs also had significantly different effects from the rest of the images, suggesting that these results are not simply effects from a more attractive design but that these behavioral strategies were indeed more effective than the

[9] As we tested a large number of hypotheses in our primary analysis, we conducted multiple comparison analysis (MCA), using the Hochberg Step-Up Procedure on these results.

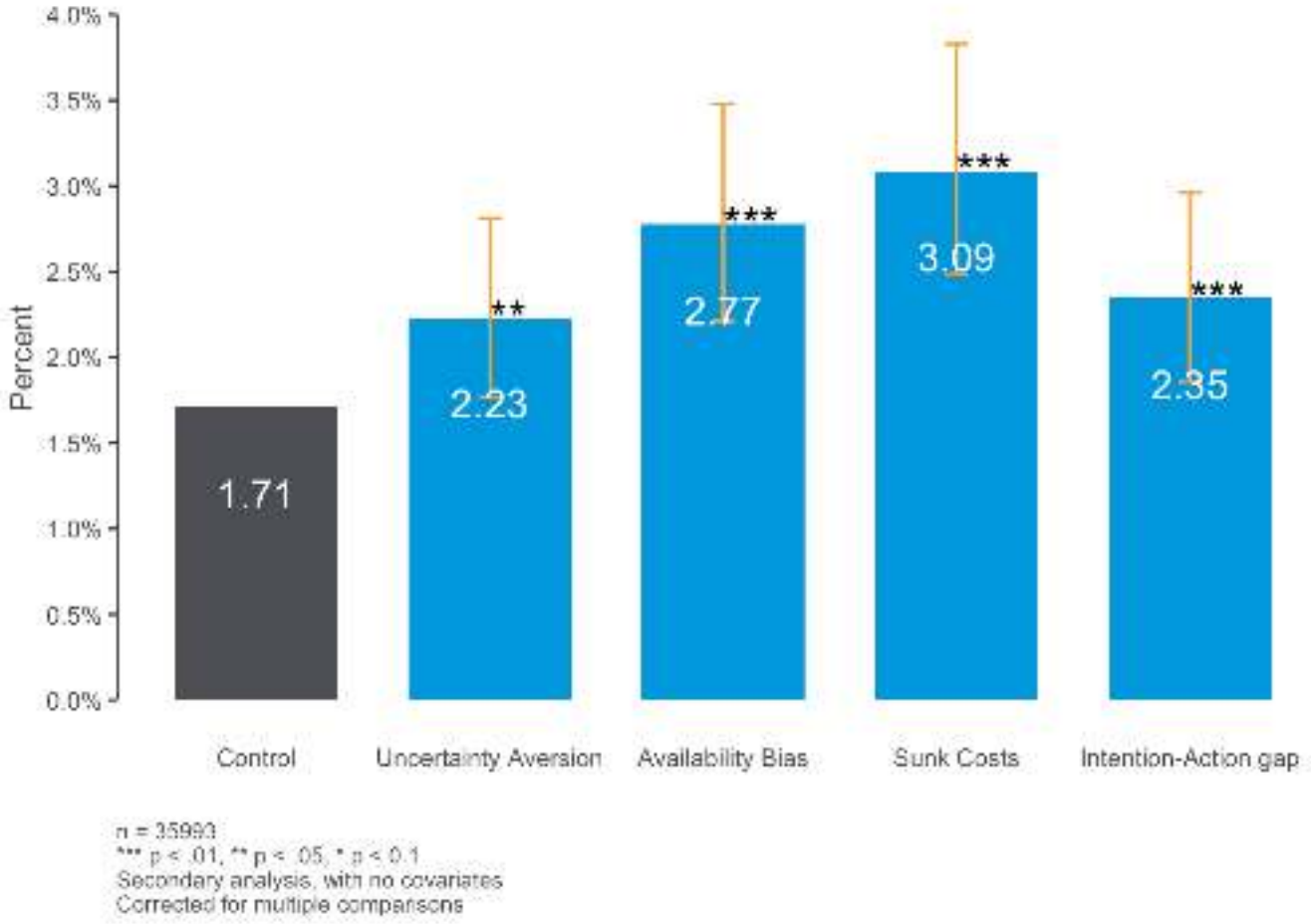

Figure 8: Treatment effects on contacting Ciudad Mujer.

rest. We present these results in Figure 7.

The regression results can be found in the Annex. As a robustness check, we have added the ordinary least squares (OLS) results.

Secondary results: Treatment effect on contacting Ciudad Mujer

In this section, we describe women's behavior after they clicked on the Facebook ad and arrived at the Ciudad Mujer website. As we have shown that the ads had differential effects on the likelihood of clicking, this sample is therefore no longer random, and differences reported here cannot be interpreted as causal. This, however, gives a more direct interpretation of the effects of the ad on the *decision to seek help* (women then clicking on any of the following channels to contact Ciudad Mujer: WhatsApp, email, Facebook, LinkedIn, or Twitter)—the second step in our model of help-seeking.

We found positive and significant effects from all our treatment arms on the likelihood a viewer would make contact with Ciudad Mujer.

Women who were exposed to the image addressing sunk costs were 80% more likely to contact Ciudad Mujer than women in the control group, while women exposed to the images addressing availability bias, uncertainty aversion, or the intention-action gap were, respectively, 62%, 37%, and 30% more likely to contact Ciudad Mujer (all statistically significant at the 1% level). Taken together with the results above on the likelihood of clicking, this suggests that the sunk cost message was overall the most effective. Given the smaller sample size in this analysis, we did not find a significant difference between treatment arms. We present these results in Figure 8, while logistic and OLS regression results can be found in the Annex.

Discussion

Given that we conducted a quantitative online

trial with limited covariates, our ability to explore the mechanisms underlying our results is somewhat constrained. Nonetheless, below we share some hypotheses based on our previous qualitative findings.

First, both images that had a significant effect addressing uncertainty aversion and sunk costs displayed women in positive scenarios. The uncertainty aversion image showed women receiving help, and the sunk costs image showed women in a positive situation after leaving an unhealthy relationship. On the other hand, the images addressing availability bias and the intention-action gap presented negative scenarios, namely, women either in shock looking at different types of violence, or in distress thinking about safety.

Second, uncertainty aversion and sunk costs were two of the strongest barriers to help-seeking that we identified in our qualitative research. The positive results from our trial suggest that tackling these barriers (i.e., reducing uncertainty about what happens after you contact a support service, and helping survivors understand how remaining with an abusive partner affects their well-being) can be an effective way of encouraging help-seeking. The image addressing sunk costs, which invites thoughts of a positive future and the end of a negative situation, was also cumulatively the strongest of all images, leading to the largest impact on women's likelihood to contact Ciudad Mujer. This suggests that taking the time to understand key behavioral barriers and develop an evidence-based theory of change is critical to addressing GBV effectively.

Conclusions

In the trial presented in this paper, we mapped barriers to a desired behavior (online help-seeking) for a specific actor (GBV survivors in Honduras), in order to devise and test targeted interventions to address those barriers. The lessons learned from this evaluation have now informed the Honduran Government's widespread communication campaigns to increase GBV reporting.

This trial illustrates three core aspects of a behavioral approach to developing GBV prevention policy: (1) drawing on evidence, (2) developing a behavioral map that describes barriers to key behaviors and dynamics among specific actors, and (3) tailoring interventions grounded in context to address these barriers.

Drawing on these insights, and motivated by the promise of this approach, we look forward to continuing our work in this space, and we would love to hear from actors interested in further innovations in GBV prevention.

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Annex

Analytical strategy: Primary and secondary outcomes

Given that our outcomes are binary, we used a logistic regression to test the effect of our treatment on the primary outcome measure.

$$Y_i \sim bernoulli(p_i)\ ;\ logit(p_i) = \alpha + \beta_1 AdA_i + \beta_2 AdB_i + \beta_3 AdC_i + \beta_4 AdD_i$$

- Ad A is a dummy variable = 1 if individual *i* was allocated to ad A;
- Ad B is a dummy variable = 1 if individual *i* was allocated to ad B;
- Ad C is a dummy variable = 1 if individual *i* was allocated to ad C;
- Ad D is a dummy variable = 1 if individual *i* was allocated to ad D.

The coefficients of interest are $ß_1$, which measures the impact of being allocated to ad A compared to Control, $ß_2$, which measures the impact of being allocated to ad B compared to Control, etc. Since these are logistic measures, the coefficients are log-odds ratios, which are not straightforward to interpret.

To interpret the effect, we used the log-odds ratio:

$$logit(p) = log\left(\frac{p}{1-p}\right).$$

Where:

- Y_i: is the primary and secondary outcome – whether instance *i*[9] of the ads results in the user Viewing Content in the Ciudad Mujer website; =1 if instance i of the ads results in the user clicking one of the Contact options on the Ciudad Mujer web page;

And subsequently converted from log odds to probabilities. The inverse of the logit function is:

$$invlogit(y) = \frac{\exp(y)}{1+\exp(y)}$$

This tells us the predicted relative probability that an individual in a given treatment group will be Viewing Content, with respect to the control group.

[9] This will be captured by reach. Reach: "The number of people who saw your ads at least once. Reach is different from impressions, which may include multiple views of your ads by the same people."

Primary results: Logistic and linear regressions[10]

Dependent variable: View Content		
	Logistic	OLS
	(1)	(2)
Uncertainty Aversion	0.186***	0.008***
	(0.017)	(0.001)
Availability Bias	-0.033	-0.001*
	(0.017)	(0.001)
Sunk Costs	0.127***	0.005***
	(0.017)	(0.001)
Intention-Action Gap	0.025	0.001
	(0.017)	(0.001)
Constant	-3.155***	0.041***
	(0.012)	(0.0005)
Observations	829,445	829,445
Log Likelihood	-148,009.500	142,747.800
Akaike Inf. Crit.	296,029.000	-285,485.700

Note: *p<0.1; **p<0.05; ***p<0.01

Secondary results: Logistic and linear regressions[11]

Dependent variable: Contact		
	Logistic	OLS
	(1)	(2)
Uncertainty Aversion	0.273**	0.005**
	(0.121)	(0.003)
Availability Bias	0.497***	0.011***
	(0.119)	(0.003)
Sunk Costs	0.607***	0.014***
	(0.114)	(0.003)
Intention-Action Gap	0.325***	0.006**
	(0.093)	(0.002)
Constant	-4.053***	0.017***
	(0.093)	(0.002)
Observations	35,993	35,993
Log Likelihood	-4,110.221	16,217.440
Akaike Inf. Crit.	8,230.442	-32,424.880

Note: *p<0.1; **p<0.05; ***p<0.01

[10] Standard errors are in parentheses. We used the Hochberg Step-Up procedure for multiple comparison analysis

[11] Standard errors are in parentheses. We used the Hochberg Step-Up procedure for MCA.

Sticky or Not? How COVID Has Changed Consumer Behaviour in Financial Services, and What Might Happen Next

Paula Papp, Kalina Kasprzyk and Harry Davies*

Frontier Economics

The COVID-19 pandemic has changed how we do many things, including how we interact with financial services. In this article, we look at three areas of financial services that have been particularly affected: household savings, use of cash and online banking adoption. We use data to understand what has changed and what has likely driven the changes. We then draw on insights from the behavioural economics literature to draw conclusions about the potential "stickiness" of these changes. We apply concepts such as habit, social norms, convenience and inertia. The conclusion? It's a mixed picture. High levels of savings are unlikely to endure once restrictions are lifted, but the decline in cash usage may well be here to stay. And while the accelerated shift to digital banking will largely persist, the pandemic has reaffirmed the ongoing importance of some human interaction in banking services.

Introduction

The COVID-19 pandemic has caused great upheaval in the financial services industry. It has accelerated the trend towards cashless payments and online banking, and seen savings jump to unprecedented levels. But are these trends temporary? Or are they "sticky" changes, set to persist over the long term? These are questions being asked by businesses and policymakers alike.

Behavioural economics can help us provide informed answers. By looking at the data we have, we can understand how consumer behaviour has changed, and what has driven these shifts. And we can use insights from behavioural economics to look at what might happen next.

We applied this approach to three areas of financial services behaviour across Europe – household savings, cash usage and online banking adoption – considering some of the most powerful behavioural drivers of economic decision-making, namely habit, social norms, perceptions, buying impulsiveness, convenience and behavioural inertia.

The conclusion? It's a mixed picture. High levels of savings are unlikely to endure once restrictions are lifted, but the decline in cash usage may well be here to stay. And while the accelerated shift to digital banking will largely persist, the pandemic has reaffirmed the ongoing importance of *some* human interaction in banking services.

Our analysis follows below, beginning with the rise in average household savings.

The Great Savings Glut

How Has Savings Behaviour Changed?

Prior to the pandemic, household savings rates were stable: between 2018 and 2020, the average quarterly rate for EU countries was around 12% of disposable income, with only minor fluctuations.

In stark contrast, savings rates skyrocketed in 2020, up to around 25%. And while that figure dropped in Q3, as lockdown restrictions were eased, overall savings balances remained at a high level. Figure 1 shows just how widespread these trends were across Europe.

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Aggregate household savings data disguise a more nuanced picture across consumer groups. People in more stable income groups were particularly likely to report a rise in their savings. In the UK, as shown in Figure 2, full-time employees (particularly high- and middle-income earners) and retirees were most likely to report an increase. On the other hand, those who were self-employed, unemployed or furloughed were more likely to have seen their savings fall.

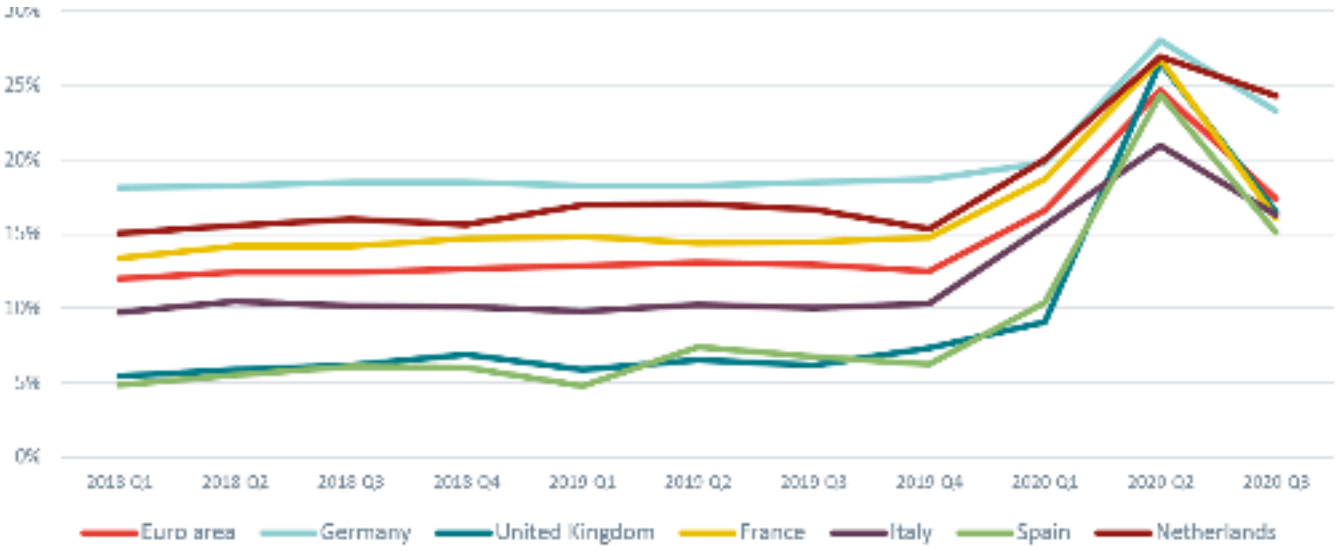

Figure 1: Household saving rates during the pandemic. *Notes*: Savings rates reported as a percentage of household disposable income. *Source*: Eurostat, ECB euro area statistics, Bank of England.

Why Did Households Save More?

The overall rise in savings rates can be put down to two main factors:

- "Involuntary" savings, accumulated "by default" as a result of fewer spending opportunities.
- "Precautionary" savings, actively put aside as insurance against greater economic uncertainty.

The European Central Bank (2020) evaluated the relative importance of these two factors in determining the household savings rate during the first half of 2020, in the five largest euro area countries.[1] They found involuntary saving was by far the main driver: an additional 11% of disposable income was being saved involuntarily in Q2 2020 relative to Q4 2019, while precautionary saving only accounted for a further 1%.[2]

Will Savings Rates Remain High? Applying Behavioural Economics

To evaluate the "stickiness" of increased savings rates, two concepts in the literature are particularly useful: **habit** and **buying impulsiveness**.

Habit is a well-documented driver of higher savings balances (Alessie & Teppa, 2009; Loibl et al., 2011). Savings decisions are often thought of as deliberate – choosing to save for a car, for example. But there are numerous smaller-scale decisions, made on a daily basis, which are subject to less reflection, like switching off the lights when leaving a room. Here, habit is more important.

Buying impulsiveness refers to a sudden desire

[1] The five largest euro area countries by GDP are Germany, France, Italy, Spain and the Netherlands.

[2] The ECB used a fixed effects panel model, using household expectations about future unemployment to estimate the impact of precautionary savings and assigning involuntary savings to the residual.

to spend money, without prior intention to do so (Beatty & Ferrell, 1998). Greater self-discipline can help temper it, and consequently increase savings (Achtziger et al., 2015).

Looking at both involuntary and precautionary saving during the pandemic through the lens of these concepts can help us understand whether higher savings rates are here to stay.

Involuntary saving

Forming a savings habit – i.e. one that will last in the long term – requires repeated cue-based responses (Lally et al., 2009). But increased involuntary saving during the pandemic has been a default outcome of the restriction of spending opportunities, rather than a more conscious response on the part of savers. By the same token, involuntary saving does not involve any increase in self-discipline or decrease in buying impulsiveness.

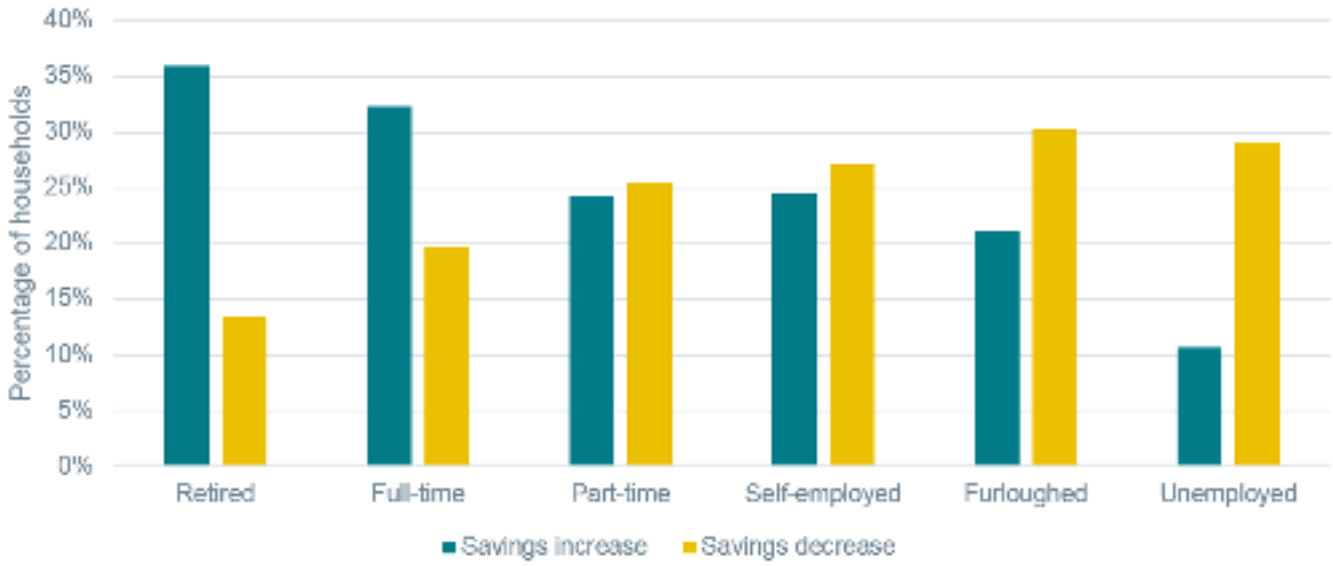

Figure 2: Household savings balances in 2020 relative to 2019, by income group. *Notes*: Totals for employment groups do not sum to 100%, as the proportion of households with no change in savings balances is not displayed. *Source*: Frontier analysis of Bank of England NMG Household Survey data for 2020.

In other words, the behavioural changes that have led to increased levels of involuntary saving are expected to be temporary and unlikely to have become ingrained, which means savings rates will be more likely to fall away once lockdown restrictions are relaxed. Evidence of this behaviour has already been demonstrated by the fall in savings rates during Q3 of 2020, as restrictions were eased during the summer months across Europe.

But there remains some scope for the forced savings generated during the pandemic to bring about some enduring increase in the savings rate. First, this can happen through permanent changes in consumption patterns – either because some of the spending categories may never recover to pre-pandemic levels (e.g. commuting) or consumers discover some easy "savings shortcuts" (e.g. adjusting to eating out less often). It remains to be seen whether consumers will seize these opportunities to save more or shift consumption elsewhere. Second, some consumers might carry on with the defaults they set up to manage their savings (e.g. a regular standing order or joining a rounding app).

Precautionary saving

The rise in precautionary saving is consistent with traditional economic models, which predict that people save more in times of economic upheaval, in order to insure against future income uncertainty (Mody et al., 2012).

We expect precautionary balances will eventually

fall, led by an increase in the consumption of "big ticket" items, postponed during the pandemic. The speed of this change will be determined, at least in part, by the strength of the narratives around economic recovery and social proof (Shiller, 2017). Shiller gives the example of the narrative during the 2007 financial crisis which drew parallels with the Great Depression of the 1930s. He suggests that the narrative at that time may have invoked expectation of a severe economic shock, which then translated into a more significant downturn. The big question around precautionary balances is how long will the feeling of uncertainty last in the case of COVID-19? And the strength of the narrative around the economic rebound will be a key factor in how long that feeling lasts.

What next?

Applying behavioural concepts indicates that there has been little change in the underlying conditions driving savings behaviour. Instead, the savings boom has been largely involuntary. For banks and retailers, therefore, the question is likely to be when, not if, savings rates drop back to "normal" – especially given the low interest rates across Europe. Moreover, it is yet to be seen what customers will choose to do with their accumulated savings balances over time.

Cash or Card?

How Has Cash Usage Changed?

COVID-19 has caused a seismic shift towards buying online, and with it a decline in cash spending. It has also prompted consumers to revisit their payment preferences for in-person purchases.

The ECB's (2020) survey of the euro area (illustrated in Figure 3) reveals steep, self-reported declines in cash usage, with 40% of respondents using cash less often.[3] Inversely, 40% of respondents said they were using contactless 'somewhat more often' or 'much more often'. Banks we work with have also reported a significant increase in the use of contactless payment, facilitated in part by the expansion of the contactless limit and mobile wallets.

These findings indicate that the pandemic has catalysed the pre-existing trends of declining cash usage and increasing cashless payment.

The disconnect between self-reported behaviour and observed behaviour is well documented

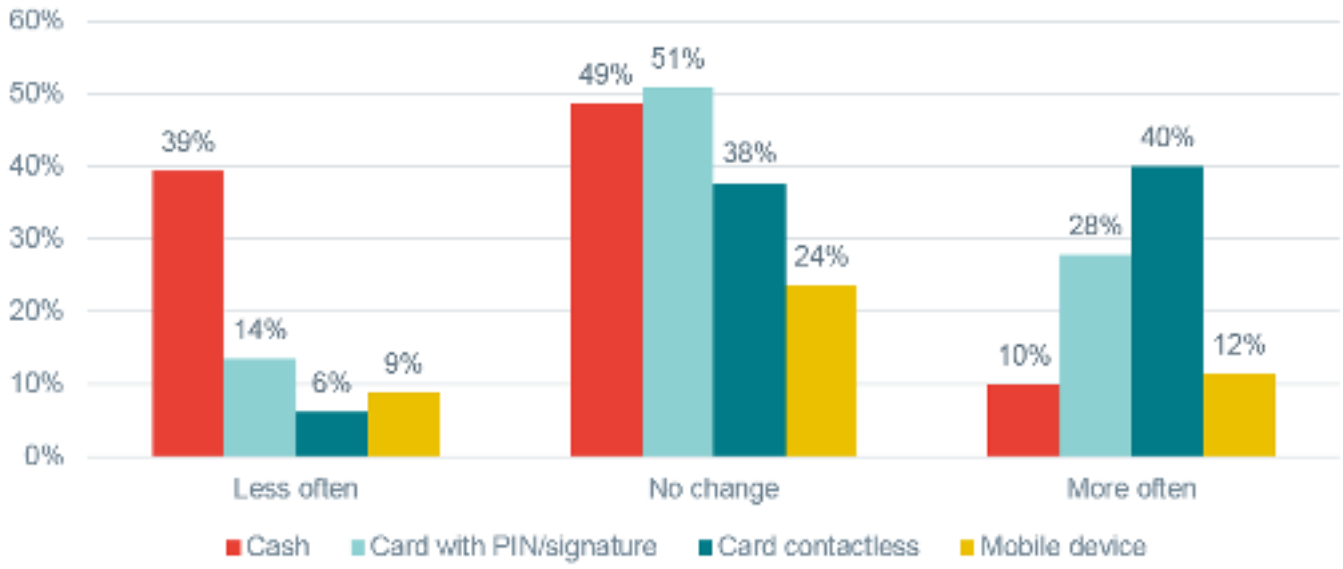

Figure 3: Payment methods during the pandemic. *Notes*: Online survey results are for the euro area (all 19 countries). *Source*: ECB IMPACT Survey (2020).

(Bertrand & Mullainathan, 2001; Jahedi & Méndez, 2014). But in this case, usage data from the UK on the volume of card transactions and cash withdrawals, presented in Figure 4, supports the survey results.

Prior to the pandemic, we see evidence of the longer-term trends of declining cash usage and increasing card usage. Then, as the UK enters lockdown, there is a lockstep fall in card and ATM transactions, accompanied by a partial "bounce back" as restrictions ease over the summer. Following that, the volume of cash withdrawals remains especially low, plateauing at approximately 35% below previous-year volumes.

Why Has Cash Usage Fallen?

One reason for the drop in cash usage is the reduction in opportunities to use it, as restrictions pushed consumers towards online shopping. UK data from the Office for National Statistics (2021) reveal that online retail sales have reached record proportions; in February 2020, just prior to the first lockdown, 20% of all sales were online – a year later, the figure had reached 36%.

Some individuals have also moved away from cash usage for in-person transactions, likely due, at least in part, to concerns about virus transmission via the handling of cash. Figure 5 shows the spike in search terms related to cash usage and COVID during the first UK lockdown, paired with increased interest in contactless payment methods and a drop in searches for ATMs.

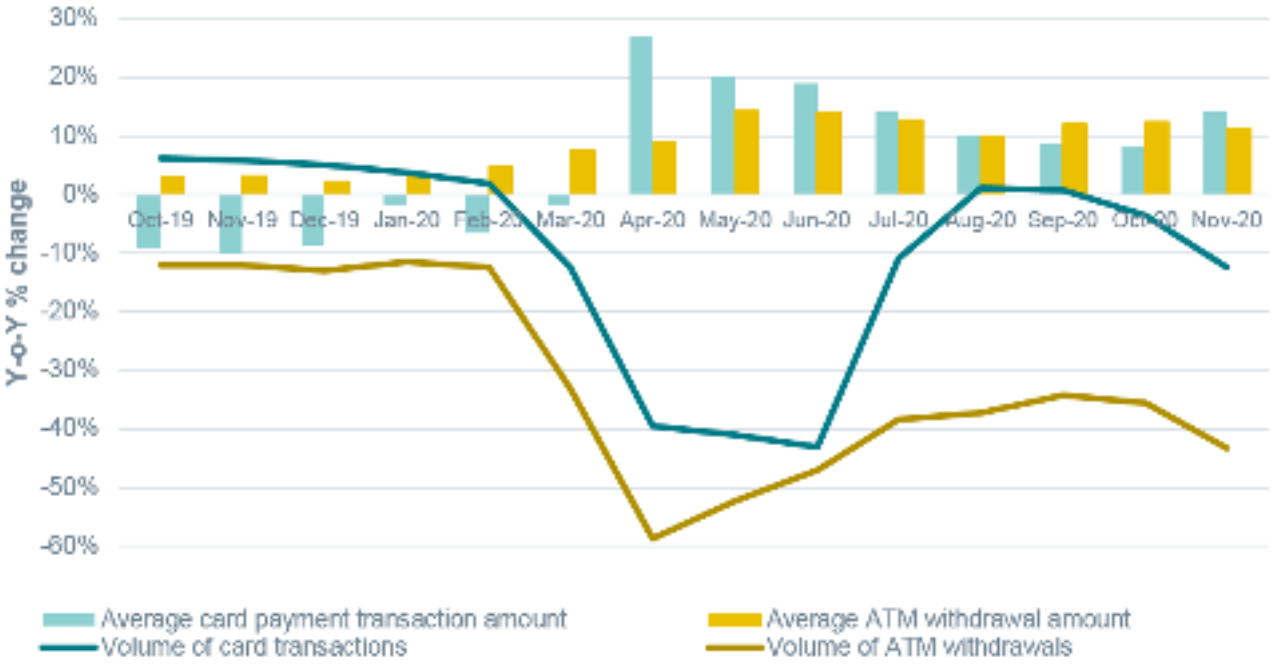

Figure 4: Year-on-year percentage change in card transactions and cash withdrawals in the UK. *Notes*: Figure shows percentage changes in monthly card transactions and ATM withdrawals (by value and by volume), relative to the same month in the previous year. Average transaction amounts are adjusted for monthly CPI. *Source*: Frontier analysis of UK finance and LINK ATM network data.

[3] At present, limited usage data are available on payment methods during the pandemic, which is why we use this survey evidence to provide a contemporaneous source of insight whilst acknowledging the potential for self-reporting bias.

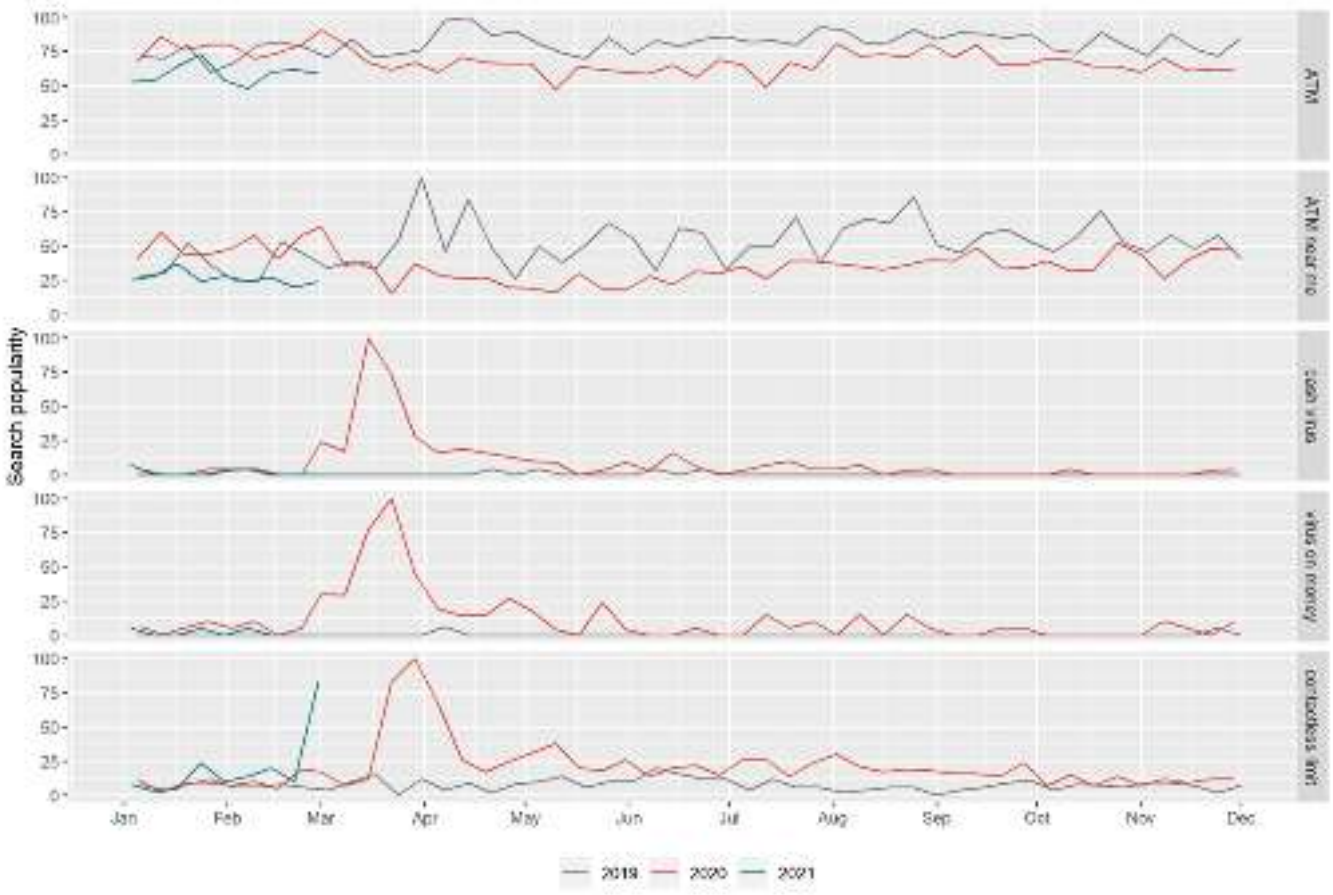

Figure 5: Popularity of Google search terms on payment methods and COVID-19. *Notes*: Search popularity indexed to maximum number of UK weekly searches between January 2019 and March 2021. *Source*: Frontier analysis of Google Trends data.

Will Cash Usage Continue to Fall? Applying Behavioural Economics

There are two ways in which the reduction in cash usage might continue beyond the pandemic: high levels of online shopping may hold, and low levels of cash usage for in-store payments may persist.

Let's take a look at each mechanism in the context of **habits**, **convenience** and **social norms**.

Online shopping

We expect convenience and habits to play a key role in moderating the dash back to the shops as restrictions are lifted:

- Many consumers will appreciate the convenience of online shopping more than they used to, or they will have experienced it for the first time.[4] This new knowledge of the benefits and costs of online shopping is expected to have continued effects beyond the pandemic.
- Repeated online purchases during lockdown may also have built new online shopping habits for some consumers. Habit has been shown in the literature, often alongside the "seductiveness" of the online shopping experience, to have a positive effect on repurchase intention (Khalifa & Liu, 2007).

In-store payments

We also expect new habits to have an effect on in-store payments beyond the pandemic. The pandemic prompted many people to review their payment choice as they sought to minimise contact

[4] OnePoll (2020) found that 20% of people buying groceries online in the UK in 2020 had never considered doing so previously.

with others. As a result, some customers may have formed different responses to the same contextual cues, generating new habits which are likely to persist as long as the behavioural cues are encountered (van der Cruijsen & van der Horst, 2019; Lally et al., 2011).

The pandemic may also have affected two types of social norms around payment (Cialdini et al., 1990):

- Injunctive norms: people's perception of the type of behaviour expected from them. Many consumers reported opting not to pay in cash during the pandemic, because the vendor no longer accepted it, or expressed a strong preference for card payment, due to COVID transmission risks. This may contribute to a "new norm" whereby consumers perceive that all vendors prefer cashless payment – which is likely, once they have invested in terminals and discovered the convenience of not having to process cash.
- Descriptive norms: the influence of the behaviour of others. Seeing more and more people paying with card may influence those who would normally use cash, tipping them towards a change in behaviour (Van der Cruijsen & Knoben, 2018).

What next?

The decline in cash usage is likely to continue beyond the pandemic, but it will not be felt uniformly.

For many, the forced shift in behaviour will have been enough to form lasting habits. But there will remain some for whom cash remains the principal, if not sole, method of payment. Given that these people often belong to the most financially vulnerable groups, the challenge for banks and retailers will be to continue developing their digital capabilities in an inclusive way.

Branching Out

How Has Online Banking Uptake Been Affected by the Pandemic?

High street banking was already in decline in Europe before COVID, with steadily increasing branch

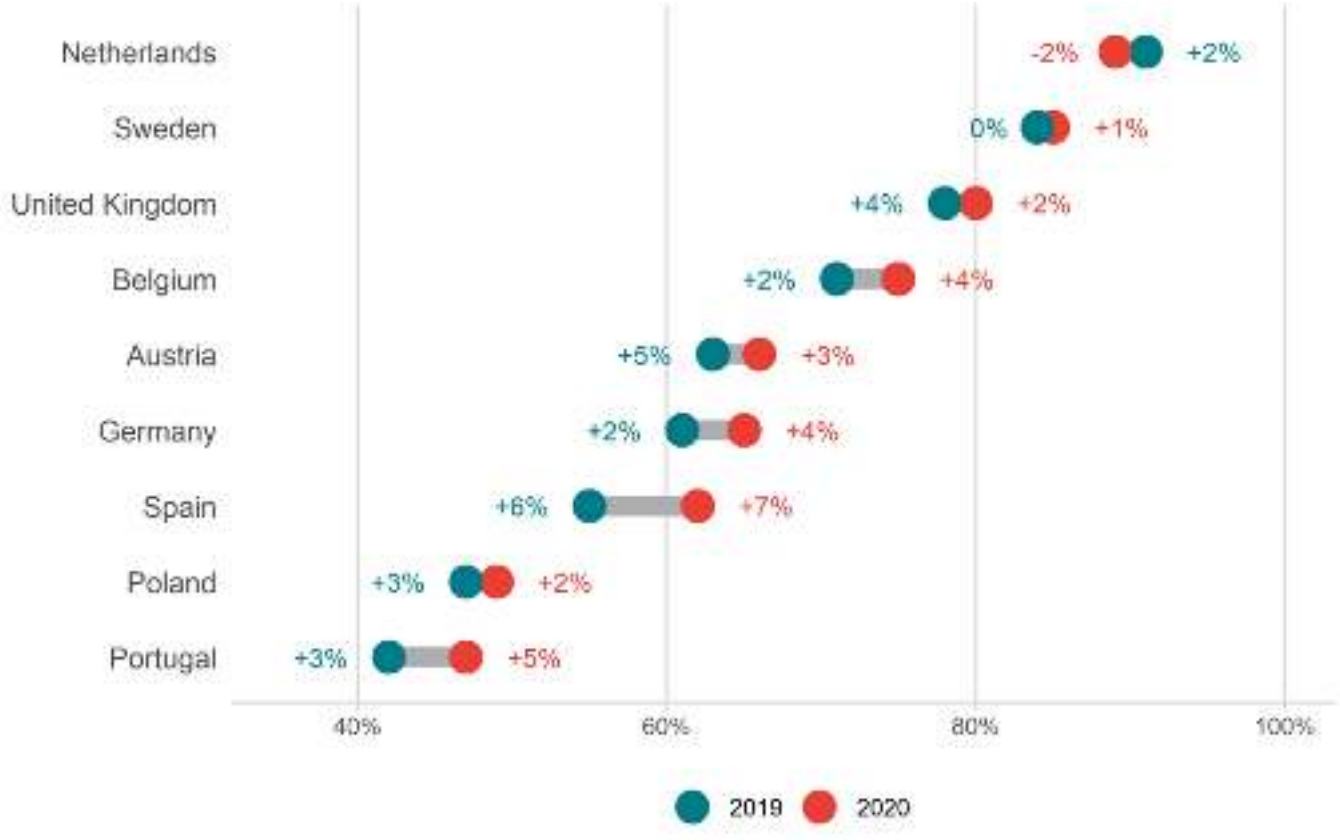

Figure 6: Proportion of adults using online banking. *Notes*: Labels show the percentage point increase on the previous year's usage. *Source*: Frontier analysis of Eurostat data.

closures and dwindling consumer demand. At the same time, preference for online banking was on the rise. As a result of the pandemic, these trends have accelerated across Europe – as Figure 6 shows.[5]

The number of registrations for digital banking is only one metric for monitoring the importance of the online channel during the pandemic. Many existing digital users have shifted more of their banking online; for instance, the banks we work with reported a significant increase in the use of mobile banking for simpler transactions, such as checking balances or transferring small amounts.

But the picture is nuanced. Many customers began to use multiple channels for the first time – and in some cases, this involved "digital-only" customers seeking more in-person contact. Data from one high street bank in the UK showed that a third of digital-only customers adopted a new in-person channel in 2020. Banks have also seen a spike in the share of customers updating their details so that they can be contacted.

This shows the continued importance of some human element in banking – even for tech-savvy customers. Among branch-only users, only 7% have switched to digital channels during the pandemic, indicating that substantial barriers to digital usage remain for some.

Will Online Banking Continue to Grow? Applying Behavioural Economics

When it comes to digital banking penetration, two behavioural concepts are important: **behavioural inertia** and the role of **perceptions**.

Behavioural inertia

When faced with new technologies, decision-makers are sometimes known to demonstrate behavioural inertia, i.e. a preference for the status quo, even when better arrangements exist (Samuelson & Zeckhauser, 1988). This behavioural trait can operate through several mechanisms – rational decisions based on perceived costs of changing behaviour, psychological commitments based on factoring in sunk costs or a desire to maintain cognitive consistency (Polites & Karahanna, 2012).

Before the pandemic, inertia is likely to have played a role in the reticence of some consumers to adopt digital banking. In particular, many will have perceived the time and effort required to set up and learn to use digital banking as a hurdle they were unwilling to overcome, particularly given the ready availability of branch or phone services.

But the temporary (or indefinite) closure of branches during the pandemic has altered this context. For some, the perceived cost of not changing behaviour has for the first time outweighed the cost of doing so. Online banking may have now become the status quo – and we may not see a rush back to in-person banking even when branches re-open.

Perceptions

New exposure to online banking may also have tested, and changed, many customers' perceptions of it.

The Technology Acceptance Model, initially developed by Fred Davis (1989), is commonly employed in the literature. It focuses on perceptions of usefulness and ease of use as important determinants of the adoption of new technologies.

In the case of online banking during the pandemic, there is evidence that these perceptions have been altered as a result of forced exposure. Mastercard (2020), for example, found that 58% of over-65s in the UK said it was easier to use their banking app than they first thought, with 23% stating that their confidence in using digital banking had increased since the pandemic had begun.

What next?

The pandemic has accelerated the trend for increased digitalisation in retail banking, with large numbers of customers adopting digital for the first time. This trend is likely to stick in the post-pandemic world. Nonetheless, one of the key insights to have emerged for retail banks is just how important some human element is in banking. For some customers, this might be a "nice to have" on top of

[5] A notable exception is the Netherlands, where levels of digital banking were already very high before COVID-19.

digital interaction and might be particularly relevant for more complicated queries where in-person advice is more reassuring. How the human element is incorporated into the otherwise seamless digital interaction for tech-savvy customers might become an important differentiator in the market. For a small minority of users, however, offline will remain the only way they engage with their banking. It will be a challenge for banks to continue servicing this customer segment while marching on towards greater digitalisation.

Conclusion: Understanding Behaviour Will Be Key to Post-Pandemic Success

Financial services providers have had to respond quickly to a fluid and uncertain environment over the past year. Now, looking ahead to the medium and long term, behavioural economics demonstrates that they will need to consider varying degrees of "stickiness" in new consumer behaviour.

Changes to savings behaviour – mainly involuntary – are expected to be the least sticky. More enduring behavioural change is expected in digital banking usage, albeit with a continued role for some human interaction, and in cash usage, where shifts to online shopping and changed payment preferences will have a lasting impact.

What should businesses do as a result? In all cases, further changes to operating models, financial products and customer service design will be necessary.

Ultimately, the providers who adapt most successfully will be those who are able to understand the behavioural changes that have taken place, and what has driven them. Essential to this is accessing the right metrics – those which capture changes in customer behaviour in real time and draw out the nuanced picture across customers. As for anticipating future trends, there are no simple answers here. Predicting the future is not easy. But grounding our hypotheses in the science of human behaviour will make financial institutions all the stronger for it.

The Authors

Paula Papp is an associate director at Frontier Economics. She has worked for more than 15 years advising a wide range of clients in the financial sector in addressing issues ranging from strategy design and regulatory compliance through to operational organisation. In doing so, she integrates the use of behavioural economics to help financial service companies understand better how their clients decide.

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Using Behavioural Economics to Drive Better Outcomes in General Insurance

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While applied behavioural economics has made large inroads in many industries and locations, there is relatively little research to date on its application to the general insurance industry in Australia. In this paper, we explore how applying a behavioural economics perspective to general insurance can generate positive outcomes for both consumers and insurers. While we explore the specific example of underinsurance in relation to the availability heuristic, defaults, and round numbers, the main purpose of this paper is to provide direction on the opportunity areas we believe would be fruitful for further research and application.

Familiar Challenges, Fresh Perspective

General insurance is vital for protecting consumers, communities and businesses. But insurance is also complex, and consumers do not always get it right in terms of protecting their assets by selecting optimal coverage, renewing their policy, and taking steps to reduce the likelihood or severity of a loss event. When consumers do not get these decisions and behaviours right, it is incumbent on insurers to address this issue in order to prevent poor consumer and commercial outcomes.

The insurance challenges we face today are not new, but a relatively new additional approach to addressing them is available. With its rich insight into human decision-making, and its approach to behaviour change, behavioural economics provides a useful lens (among others) through which insurers can understand consumers, mitigate these challenges, and create good outcomes for all.

A Perfect Storm: Insurance has the Hallmarks of Difficult Decisions, and We're Only Human

At its core, the main idea of insurance is to pool and spread risk. Many consumers each pay a certain amount of money (their premium) to be protected from a potentially devastating loss.

This may sound simple, so why can insurance decisions be hard to get right? The UK's Financial Conduct Authority (FCA) describes five features that can make financial decisions particularly difficult to make well (Dambe et al., 2013). They occur when:

- Products are inherently complex
- Products involve trade-offs between the present and the future
- Decisions may require assessing risk and uncertainty
- Decisions can be emotional
- Products permit little learning from past mistakes.

Insurance – whether to purchase it, for which risks and at what price, excess and sum insured – matches all five of these features.

Readers will be familiar with the behavioural economics tenet that contrary to traditional economic models of human behaviour, people's decision-making and behaviour are influenced by our cognitive limitations, biases, heuristics, emotions, and other 'supposedly irrelevant factors', or SIFs (Thaler, 2016). In the words of Richard Thaler and Cass Sunstein (2009), rather than the rational automaton 'Econs' of traditional economic models, we are 'Humans', i.e. the very efficient and yet

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Features Typical of Error-Prone	General Insurance Relevance	Behavioural Economic Relevance
Products are inherently complex	Underwriters use complex modelling to determine the 'technical price' of a risk, using up to "thousands of lines of calculations" (AFCA, 2020). The price is determined by multiple inputs (relating to the world (e.g. climate trends), the asset (e.g. its elevation above sea level), the consumer themselves (e.g. a new driver), and other factors. The value is uncertain and conditional on probabilistic events. There are many different attributes to compare, and the maths is not simple.	We have ***cognitive limitations***. Levels of ***numeracy***, ***literacy***, ***attention*** and ***risk tolerance*** can affect ***comprehension*** and ***preferences*** (how well we understand the product and whether we want it) (ABS, 2008; see Dolan et al., 2010, and BIT, 2014, for reviews). A complex product will have ***high search costs*** and be ***hard to evaluate***, and ***hassle factors*** may impede action (Bettinger et al., 2012; see BIT, 2014 for a review). Those who are experiencing ***scarcity*** may find this even more challenging than others (Mullainathan & Shafir, 2013; Shah et al., 2012).
Products involve trade-offs between the present and the future	To buy an insurance policy, a consumer trades off an immediate certain amount of money (the premium) for a future possible payout (the claim) less a future cost (the excess).	People often exhibit ***present-bias*** and are ***myopic***, ***narrowly focused on the short term*** (Laibson, 1997). We may ***procrastinate*** (Madrian & Shea, 2001; Thaler & Bernartzi, 2004; Thaler & Sunstein, 2009 for a review).
Decisions require assessing risk and uncertainty	Insurance decisions are fundamentally about assessing risk under conditions of uncertainty: how best to mitigate the risk of a large loss resulting from an uncertain event.	Not only is the ***maths involved difficult***, but also other factors, like ***optimism*** (Puri & Robinson, 2007; Sharot, 2011; Weinstein, 1980) or ***how easy it is to imagine the loss*** (Tversky & Kahneman, 1974; Johnson et al., 1993), can affect how we evaluate risk and make judgments in uncertain and ambiguous conditions.
Decisions can be emotional	Insurance protection is arguably also about peace of mind and avoiding regret, fear, or anxiety. Imagining a future loss may be emotionally uncomfortable. Searching for information about policies or risks might be boring or unpleasant.	Emotions and states such as ***stress, anxiety, affection, fear of loss and fear of regret may weigh heavier in a person's decision-making than a purely financial assessment*** of the costs, benefits, and expected value of the policy (Zeelenberg, 1999; Hsee & Kunreuther, 2000; Aseervatham et al., 2015). We sometimes ***avoid seeking out information*** that can be psychologically distressing (Karlsson et al., 2009).
Products permit little learning from past mistakes	There is a mismatch in frequency between decisions (monthly payment of premiums, annual renewal) and rare events against which the decisions are meant to protect. The consequence of a 'bad' decision in insurance is only seen infrequently (e.g. after theft, fire, flooding), with a delay, and over a long time period. Low probability high consequence (LPHC) events are likely to affect only a few people relatively infrequently.	***Frequency and timing of feedback*** matters. People tend to learn best when the consequence of their decision is immediate. Due to the mismatch in frequency of decisions and loss events, consumers may use overly short time horizons and therefore misinterpret the feedback. The time horizon of a rare event may lead to the 'wrong' lesson learned, e.g. 'there were no floods this year, so I wasted money and should not renew my policy'.

Table 1: Features typical of error-prone decisions (col 1, adapted from Dambe et al., 2013) are all evident in the context of insurance (col 2); behavioural economics can help explain why these decisions are difficult (col 3).

sometimes fallible, real people of behavioural economic models.

With this in mind, Table 1 presents an overview of how general insurance maps back to the FCA's five features typical of error-prone decisions along with key concepts from behavioural economics. Taken together, the complexity and inherent uncertainty associated with general insurance, plus our human decision-making and behavioural tendencies, paint the picture that:

- People may not even understand the value equation of insurance, or they are unable to calculate it (due to pricing complexity and lack of transparency, as well as cognitive errors and limitations)
- Even if they did know it and could calculate it, other factors (biases and heuristics, sometimes based on SIFs) may come into play to influence people's evaluations of its components
- The economic equation misses out on unquantifiable components that nevertheless matter greatly (emotional influences and potentially competing goals).

The point of understanding behavioural economics by contrasting it with traditional economics is not to suggest that we are all hopelessly imperfect, but rather to highlight that certain aspects of insurance may have been inadvertently designed with the traditional models in mind[1]. Where traditional economic benchmark models and the behavioural economic models differ is where we might see market inefficiency, or what we call "risk hotspots" – areas with high risk of poor consumer and commercial outcomes.

Risk Hotspots – the Potential for Poor Consumer and Business Outcomes

Three hotspots that we believe are particularly important for general insurance are illustrated in Table 2.[2]

Potential outcomes, for example underinsurance, are likely the result of both traditional economic factors – including affordability, misaligned incentives, or information asymmetries – and behavioural economic factors (as described in Table 1).[3] Understanding the decision-making processes of consumers buying insurance, and how these processes interact with how actuaries, underwriters and insurers develop, price and market insurance products, is increasingly important. While a behavioural economics view will not be the silver bullet, without it, an insurer will have an incomplete picture of the issue at hand and the approaches that may help to solve them.

Let us explore one of these persistent challenges in more depth: suboptimal levels of insurance.

Poor decisions about coverage can result in a consumer being over-insured or underinsured (including non-insured).

[1] For example, disclosure documents aim to improve consumer outcomes by providing more information. The traditional economic model predicts that more information will lead to a consumer making a better choice. A behavioural economic perspective, on the other hand, would suggest that in their current form – several pages long and full of jargon – these disclosure documents are arguably not fit for purpose, as they do not cater to our limited attention span and literacy levels.

[2] The hotspots in this paper are based on the decision-making and behaviour of the consumer, aka demand-side hotspots. There are also supply-side risk hotspots identified in the academic literature (such as not offering cover despite it making financial sense to do so; not offering cover at prices that accurately reflect risk; reinsurance prices decreasing after a period without disasters) which are outside the scope of this article. See Kunreuther et al. (2013).

[3] Price is a traditional economic concept, but a customer's perception of affordability will be affected by behavioural economic concepts, as it involves making trade-offs that will depend on the salience and priority of other financial commitments, value perception, time bracketing, etc. Price alone is not enough to solve for suboptimal insurance; for example, Kunreuther & Pauly 2015 found that even when insurance is offered at a better-than-technical price, some people still fail to buy it. The authors suggest using behavioural economic tools to enhance the messaging and thus to increase adoption.

Hotspots	Risk of Poor Outcomes for	
	Consumers	Insurers
Sub-optimal decisions about coverage	Financial devastation [underinsurance, no insurance] Paying too much [over-insurance]	Missed opportunity for consumer growth, revenue, data, economies of scale [underinsurance]
Insufficient engagement at renewal time	Renewed policies may not adequately reflect changes to circumstances	Regulatory scrutiny Eventual attrition
Failure to practice safer behaviour despite good intentions	Unpreparedness and longer recovery Higher premiums	Higher cost of claims

Table 2: Key hotspots in general insurance that have the potential for poor consumer and commercial outcomes.

Underinsurance (including non-insurance) is a material problem for Australia; by the end of 2020, it was reported that 37.5% of all households were underinsured (DBM Consumer Atlas, n.d.). For a consumer, the consequences of underinsurance can be financially devastating, including loss of shelter or mobility. For an insurer, underinsurance is a missed opportunity for revenue. Moreover, more customers or policies in the market has collateral benefits such as economies of scale and more data, which could lead to more accurate risk pricing.

Research to date has begun to understand suboptimal insurance coverage in the following ways: analysing the difference between insured losses and the total economic loss value (the "protection gap" (ANZIIF, n.d.), identifying where consumers are paying far too much or too little compared to the expected (financial) value of the policy, thus implying unrealistic levels of risk tolerance/risk aversion, or comparing the number of assets (e.g. households or cars) in the market to the number of insurance policies sold.

Nevertheless, it is difficult to pinpoint exactly what objectively constitutes suboptimal coverage, because the value exchange includes aspects that are subjective and differ between people, such as risk tolerance and peace of mind.

Note that the ways in which the industry determines "optimal" coverage may be different to how a consumer defines this factor, and as such, consumers and insurers might be optimising (or satisficing) in relation to different factors and over different time horizons. As a business, insurers rely on their understanding of underwriting and insurance risk over time in the absence of a consumer's personal or household financial ecosystem, including their financial constraints. An insurer will therefore typically view "optimal" insurance for the consumer as sufficient coverage to restore them to their pre-event financial state. This suggests that insurers take a relatively long-term perspective when working towards positive consumer outcomes. If the consumer's main objective, on the other hand, is to manage a short-term household budget, their best outcome may be different than if they were managing a longer-term or (unknowable) lifetime budget. Future research should explore this topic in more depth.

As mentioned earlier, there may be many different factors contributing to underinsurance, so in order to identify whether – or where – behavioural economics matters, insurers can begin with a behavioural exploration or audit. This may include looking for anomalous consumer behaviour, evidence of SIFs mattering, or where it appears that a consumer's decision-making and behaviour are not in their own best interest.

Availability Heuristic

People tend to make judgments about the likelihood of an event based on how easily it comes to mind, whether through direct experience or media stories (Tversky & Kahneman, 1974).

Research from other countries finds evidence to support that the availability heuristic influences insurance decisions. Analysing flood insurance in the USA, for instance, researchers found that people tend to buy insurance policies after experiencing or hearing about an event (when the risk is more "available" and front of mind), and they cancel insurance policies over time if they have not experienced a bad event (Gallagher, 2014; Atreya et al., 2015; Michel-Kerjan et al., 2012). Gallagher (2014) finds that flood insurance take-up increases by 9% following a flood in the same area. Despite their mathematical expertise, insurers themselves have also been shown to exhibit the availability bias, by limiting the supply of coverage after terrorist events or natural disasters (Kunreuther & Pauly, 2015). Relatedly, a more vividly detailed risk may be perceived as higher risk than a less vividly described risk (Johnson et al., 1993). Johnson et al.'s laboratory study found that people were willing to pay more for (hypothetical) insurance when the risk was more specific, despite the coverage being more narrow and therefore objectively worth less.

The importance of the availability heuristic for insurers is that consumers may be more likely to buy or renew a policy, or engage in safer behaviour, if they have recently experienced a loss event or seen it covered in local media. Conversely, consumers might exit insurance (cancelling or not renewing policies) prematurely if they do not experience a bad event.

Defaults

Defaults are a well-known behavioural tool that can influence behaviour (Jachimowizc et al., 2019). In insurance, they have been found to influence the take-up of coverage for different risk types (Johnson et al., 1993), especially for consumers who are inexperienced with insurance decisions (Robinson et al., 2021). For example, Johnson et al. (1993) found, in a natural experiment, that when the right to sue for pain and suffering was included in a default motor insurance policy, the purchase rate of this right was higher than when not included as a default.

This finding suggests that defaults matter when deciding about what types of insurance coverage to purchase, but it is also likely that defaults affect the amount of coverage purchased. More specifically, once a consumer has decided to purchase insurance and is going through the process of selecting their sum insured and excess amounts, they may stick with the default amounts presented to them on screen. In a sample of over 45,000 customers purchasing building and contents insurance online, we find that over four in 10 customers stick with the sum insured value that an online sum insured calculator (consumer calculation tool) presents, which serves as a default (IAG internal data). A similar proportion adjust their sum insured amount downwards from the default, which could potentially be an indication of affordability issues, optimism, myopia, or other factors yet unexplored. Only 15% adjust their sum insured upwards (IAG internal data).

Defaults are therefore important for insurers, because how the manner in which different types of policies or amounts of coverage are presented might affect the consumer's ultimate protection.

Number Roundness

People may prefer round numbers for their cognitive ease (Kettle & Haeubl, 2010). Wadhwa and Zhang (2015) studied the roundness of numbers in product pricing and found that people want to "feel right" about their decision-making with respect to purchases. For goods that are utilitarian (practical), people were happy to settle on non-rounded prices, whereas for hedonic (luxury) goods, they preferred round numbers for their cognitive ease. When consumers already have a high cognitive load, they tend to prefer rounded numbers; when there is low cognitive load, they prefer exact numbers. While this work focused on pricing and not explicitly about sum insured amounts, it is a useful input to help us hypothesise and explore what this means in an insurance context.

Insurance is more utilitarian than hedonic, so

given Wadhwa & Zhang's study we might expect consumers to prefer exact numbers. However, insurance is also very complex, as described above, so consumers are likely to have high cognitive load during the quote process when they are inputting details about their assets and making choices about coverage, excess, and sum insured. Consequently, on balance, we might expect that high cognitive load may be driving consumers to prefer round numbers when selecting their sum insured amount. Indeed, in a sample of over 45,000 customers using an online channel to purchase insurance, sum insured values cluster at $50k intervals (Figure 1; IAG internal data).

Note that the roundness of the sum insured number is especially "irrelevant" (as in a Supposedly Irrelevant Factor), because a round number in this regard will not necessarily (nor even likely) result in a round number monthly or annual premium, thereby casting doubt on a potential rationale that picking this sum insured amount might be an attempt to simplify household budgeting.

Taken together, these concepts help us understand that factors such as how (and how much) a risk is covered in the media, whether risk types are included or add-on, and digital sum insured calculator amounts could have a meaningful impact on a consumer's decision, and the consumer might adjust their sum insured value to satisfy a number of factors, including affordability, optimism, and potentially the roundness of a number.

Using a Behavioural Economic Approach to Improve Consumer Outcomes

While behavioural economics might enhance our understanding of "why" these risk hotspots are present, it is also invaluable in providing levers for

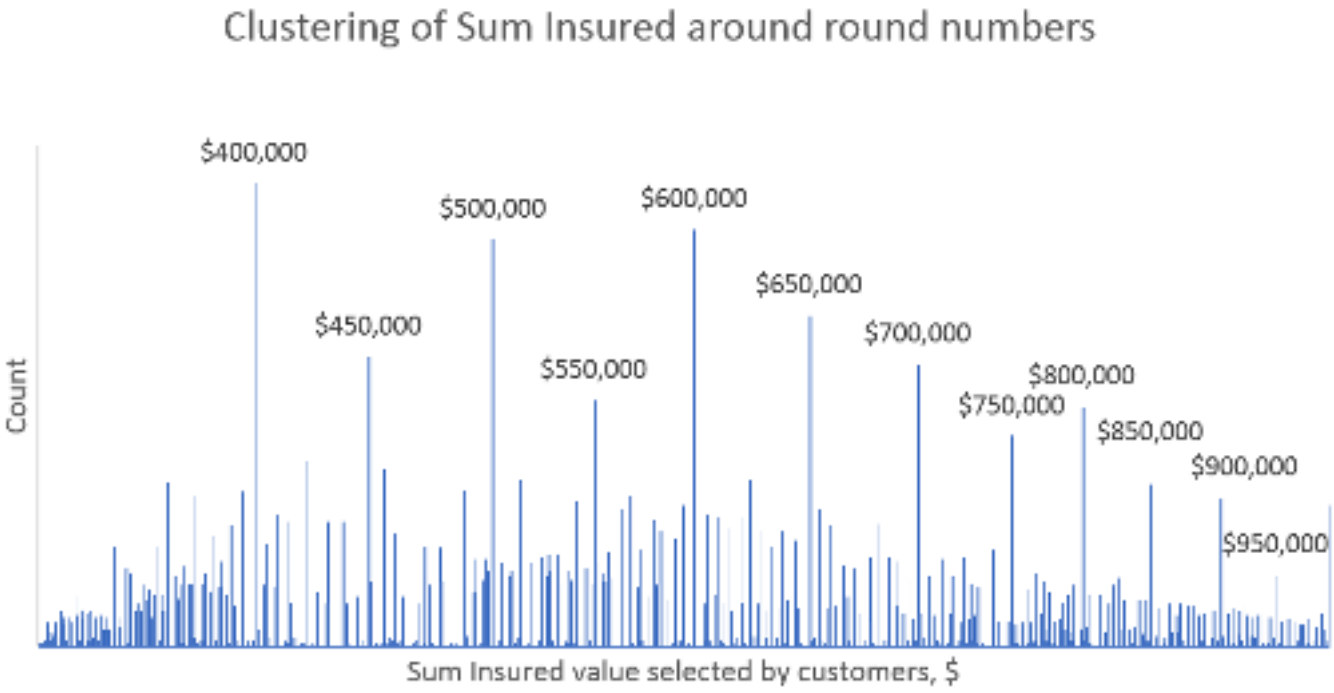

Figure 1: Buildings and HPAC New Business acquired through Web Channel, by Building Sum Insured Value.

change. To date, strategies for designing effective or impactful change in insurance are still heavily reliant on traditional levers such as: (1) financial incentives, (2) rules and regulations and (3) the provision of information and education (Soman, 2015).

Unfortunately, these traditional levers alone have not been enough to solve these seemingly intractable problems. We argue that the addition of behavioural economic levers will go a long way to mitigating these challenges and driving better consumer outcomes.

Behavioural economics can be leveraged in differ-

ent ways to improve consumer outcomes, but arguably, the most impactful and sustainable way will be one that works towards wholesale, systemic behavioural and societal change. Although we may focus on the addition of choice architecture as a lever for change, amongst traditional levers, to "remedy each bias", "optimise touch points" or "improve products, services and the consumer experience" (amongst others), we would be remiss if we did not ask ourselves "for what purpose?" along the way.

To be clear, using a behavioural economics approach is not about getting everyone to purchase more insurance protection per se; rather, it is about supporting decision-making and behaviour in a way that contributes positively to the emotional, physical and financial wellbeing of an individual and society, should something "bad" happen. In practice, this means placing a greater emphasis on behavioural research, analysis, and design within a system, as opposed to focusing solely on discrete, independent decisions (Khan & Newman, 2021).

A recent review of the literature by Pitthan and DeWitte (2021) suggests that the biases and heuristics that affect insurance decision-making are mostly driven by lack of knowledge or misuse of financial concepts and products, linked to low levels of financial literacy. As such, they propose financial literacy treatments that serve to improve knowledge and use of finance as a potential systematic solution. While financial literacy treatments may be an appropriate intervention in some cases, we argue that for an insurer, a systemic, purpose-led approach – using both behavioural economics and traditional levers (such as awareness, education, and community and stakeholder engagement) – is important in remedying risk hotspots.

What matters most is that this approach translates into real-world, measurable impacts. Alongside asking the question 'for what purpose?', it is imperative to design consumer behavioural outcome measures that ensure we are delivering on this purpose every step of the way.

Conclusion

The same challenges that insurers face with respect to consumer decision-making and behaviour also present an opportunity: if insurers are able to add behavioural economics to their suite of existing capabilities and approaches, there is the opportunity to mitigate these persistent challenges and provide better outcomes to both consumers and their own bottom line. Insurers can gain a richer understanding of their customers and translate this knowledge into real-world impacts that are purpose-driven and measurable. With Australian financial services regulation moving towards a focus on fairness (Robinson, 2020) and the scrutiny of how product development and distribution practices drive consumer outcomes (ASIC, 2018), there is no better time than now to ramp up a behavioural economics approach in general insurance.

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Brick by Brick: How Targeted Messaging Can Help Customers With Low Savings Build a Buffer

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ING

Having sufficient savings is extremely important for dealing with financial shocks and staying financially healthy; nevertheless, many Europeans do not have such a savings buffer, and so they could use some help. Building on behavioural science, we test two interventions to encourage vulnerable ING customers (i.e. with less than €2,000 savings) in the Netherlands to increase their buffer. Focusing on actual transfers to savings accounts and the net saving balance, we examine the influence that the fear of missing out and temporal reframing can have on savings growth. The studies demonstrate that the target group transferred €48 more to their savings accounts when the fear of missing out was activated, and when saving was presented in bite-size, recurring steps, they transferred €68 more to their savings accounts, resulting in a €25 increase in the net balance. These findings show how fruitful behaviourally-driven actionable insights can be in guiding saving behaviour.

Introduction

Building a sufficient rainy-day fund has always been important. Savings are crucial for dealing with financial shocks such as income reduction or large, unexpected expenses, and staying financially healthy. Nonetheless, many people struggle to accumulate savings and fail to build and maintain a sufficient buffer, making them vulnerable to running into other financial issues such as problematic debt.

Although there is no general agreement on the minimum size of a household emergency fund, the UK Money Advice Service suggests holding three times the household's monthly expenses in an instant access savings account. NIBUD, the Dutch equivalent institution, suggests people put aside 10% of their monthly income. Easy and simple rules of thumb, you could say, but saving is not easy for everyone. Some people don't feel motivated to save, whereas others simply do not have the capacity to do so, because their expenses absorb all of their income. According to the ING International Survey, conducted in December 2020, 22% of Europeans indicated that they did not have any savings, a number that has been relatively consistent over the past few years. Moreover, nearly six out of ten Europeans were dissatisfied with what they saved each month (INTRUM, 2020). People with low savings could thus use some help to build a buffer, a role that fits financial institutions well. At the Think Forward Initiative and ING, we have taken this responsibility and are applying behavioural science to increase savings among ING's vulnerable customers with less than €2,000 savings in The Netherlands.[1]

Although most people know that saving is important, for many it is still hard to put a little money aside. Behavioural change theories help us understand why people have difficulty in saving or changing this habit (Fogg, 2009; Michie et al., 2011). For people to change behaviour and start a healthy saving routine, they need to be triggered by the environment, feel motivated and – importantly –

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[1] In a five-month collaborative programme, multiple actionable insights were developed and tested in the ING banking app, aiming to help people with low or no savings increase their savings buffer and build saving habits. The two studies presented in this research are part of this larger experimental programme.

have the ability to save. When one of these elements is lacking, it is harder to start and/or stick to a savings plan (Fogg, 2009). For example, some people may need to spend every spare penny to pay off a consumer loan, which makes it impossible for them to save. However, as soon as they have paid off their loan, a saving opportunity arises. Finding those sweet spots, and using behavioural techniques to encourage individuals, could set the stage for driving change.

In this article, we test two interventions based on influential behavioural techniques to help vulnerable people (i.e. ING primary customers with less than €2,000 savings) increase their buffer. We believe that the value of such techniques lies in applications offered at the right time and with a direct opportunity to take action. ING offers a range of tools in its digital environment, to help customers build a financially healthy future, and sends actionable insights to customers in its banking app. This combination of targeted communication (to trigger and motivate customers to save) and linking the right tools (to improve the ability to save) could make the difference in helping people low in savings build a buffer.

There are numerous behavioural techniques that can steer people's decisions. This research does not aim to test all techniques; instead, it hopes to provide insights into how some of these concepts can be employed to help people most in need. Specifically, we test the influence that the fear of missing out and temporal reframing can have on the amount saved among the financially vulnerable.

Fear of Missing Out

People have a central need to be around others. They want to form and maintain lasting, positive and significant interpersonal relationships (Baumeister & Leary, 1995; Maslow, 1943). This need to belong is universal and an important driver of our emotional responses and behaviour. It even causes people to experience the fear of missing out (FOMO; Xie et al., 2018).

The fear of missing out is the desire of people to stay continually connected aligned with the uneasy feeling that they are missing out on social activities (Przybylski et al., 2013; Riordan et al., 2015). It is often believed to affect individuals negatively, as it has the power to increase purchase decisions (Abel et al., 2016; Hodkinson, 2019). But would it also be possible to use the fear of missing out to boost saving instead of spending money?

This fear seems to be particularly activated in the case of *partial belonginess*, i.e. relatedness without interaction (Baumeister & Leary, 1995). Due to Covid-19, many Europeans have been socially restricted: mostly home-bound and allowed to meet only very few social contacts. However, with the vaccination programmes on the roll, there seems to be light at the end of the tunnel; consequently, people could be more receptive to small reminders about missing out on future social activities. Nevertheless, would they consider saving money now, which they could spend when restrictions are further relaxed, to keep their fear of missing out to a minimum?

Temporal Reframing

Saving and spending can feel like a trade-off (Frederick et al., 2002). Saving reduces the amount free to spend and can be perceived as a direct loss in spending power (Hershfield et al., 2020). Temporal reframing, which could help soothe the psychological pain of reduced spending power (Goldstein et al., 2016; Hershfield et al., 2020), involves presenting large costs as a series of smaller ongoing expenses (Gourville, 1998). It is often used to sell big-ticket items such as electronics and cars by breaking down the cost price into daily, weekly or monthly instalments (Bambauer-Sachse & Grewal, 2011).

Although most research on temporal framing has focused on cost perceptions in purchases, we believe, like others (Hershfield et al., 2020; Colby & Chapman, 2013), that it could be a successful instrument for driving savings. Hershfield et al. (2020), for instance, found that presenting savings in a more granular format encouraged people, particularly those with a low income, to participate in a recurring deposit programme. Moreover, when presenting a savings goal in weekly subgoals, people were more willing to forego a small purchase in order to reach it (Colby & Chapman, 2013). These find-

ings are promising but still leave the question open as to whether temporal reframing also increases the actual amount of money saved instead of only the intention to do so. We will test whether it has this direct consequence on actual savings among our vulnerable target group, varying the levels of temporal granularity (i.e. weekly or monthly steps). Temporal reframing of saving could be especially important to people in a stretch. Given they are likely to have a restricted income, saving via small recurring steps could be helpful in building habits and constructively growing a buffer.

Experiment 1: Fear of Missing Out

In Experiment 1, we tested whether ING primary customers with small amounts of savings would be receptive to insights reminding them of the fear of missing out on future social activities. We expected that in the current context of COVID-19, where many people have been limited in their interactions with others, customers would be sensitive to such an insight motivating them to save extra money to spend in the future.

Method

Participants. In total, 124,388 ING primary customers with less than €2,000 in savings participated in our field experiment (M_{age}=43.10, SD_{age}=16.54, 50.9% male). Customers were randomly assigned to one of the three conditions (FOMO, Neutral and No insight) in a between-subjects design. Both the Neutral and the No insight conditions served as controls.

Procedure. Over a two-week period, participants in the FOMO and Neutral conditions were shown an insight (at least once) after they logged into their banking app. In the FOMO condition, participants received a slightly different insight than in the Neutral condition (see Table 1). After receiving[2] the insight, customers could click on a button which would direct them to the transfer feature of the app. The customers could transfer money to their savings account(s) directly, but they could also do it at a later date manually or not transfer any money at all. Customers in the No insight condition did not receive an insight on saving. In all three conditions, participants' savings were tracked over the two-week period in terms of the amount transferred to their savings account(s) and the net savings balance at the end of this period (i.e. the amount transferred to their savings accounts minus the amount withdrawn). We identified 441 participants (0.4%) as outliers and removed them from the analysis.[3]

Results

Amount transferred into savings account(s). A one-way ANOVA on the amount transferred into customers' savings accounts showed a significant difference across the three conditions, $F(2,123944) = 216.60$, p <.001. Simple contrasts (t-tests) showed that customers in the FOMO condition (M_{FOMO}=248.71, SD_{FOMO}=641.82) transferred most money during the two-week experimental period, followed by customers in the No insight (M_{None}=200.42, SD_{None}=570.72) and the Neutral ($M_{Neutral}$=171.79, $SD_{Neutral}$=563.78) conditions. All contrasts were significant (*t's*(123944) >6.02, *p's* <.001).

Net savings balance. A one-way ANOVA on the customers' net savings balances showed a significant difference across the three conditions, $F(2,123944)= 4.57$, p =.01. Customers in the FOMO condition (M_{FOMO}=48.46, SD_{FOMO}=922.17) had the highest net savings balance at the end of the two-week experimental period, followed by customers in the No insight (M_{None}=39.03, SD_{None}=776.77) and the Neutral ($M_{Neutral}$=26.93, $SD_{Neutral}$=1446.93) conditions. Simple contrasts (t-tests) showed that only the difference between the FOMO condition and the Neutral condition was significant ($t(123944) = 2.85$, p =.004), but the other contrasts were not significant (*t's*(123944)< 1.433, *p's* >.152).

[2] Customers receiving the insight could choose to accept, snooze or delete it. Those who snoozed the insight would see it again within the two-week period.

[3] In Experiments 1 and 2, outliers were detected based on the studentised residuals (SRs) of both dependent variables. Cases with |SR| > 3 were marked as outliers.

Condition		
FOMO insight		Is corona causing you to spend less? Put that money aside now. Don't miss out on anything when things go back to normal. You will have a fund to use for whatever you wish! Great idea, let's start!
Neutral insight		Is corona causing you to spend less? Put that money aside now. Great idea, let's start!
No insight		N.A.

Table 1: Actionable insights per condition in Experiment 1.

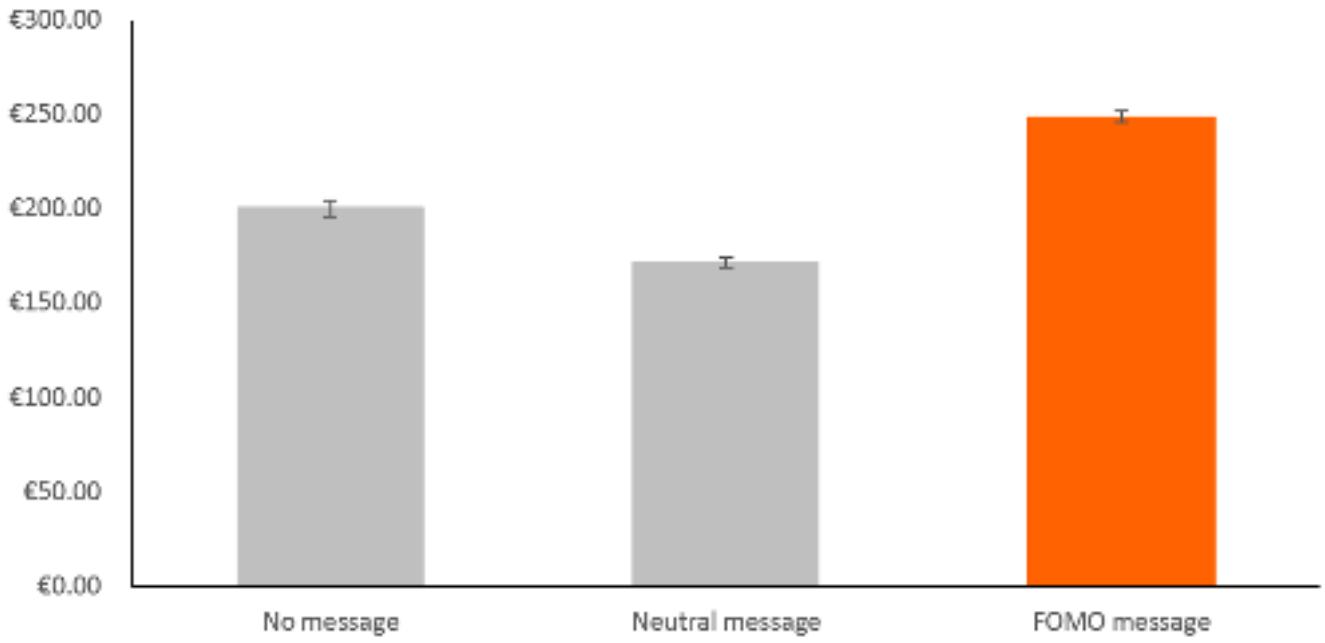

Figure 1: Amount transferred to savings account(s) per condition in Experiment 1. *Note*: Error bars represent ± 1 standard error.

Discussion

The findings demonstrate that an insight triggering the fear of missing out on future spending positively influenced the amount of money transferred into the savings accounts of the customers in our target group. Customers receiving this insight transferred, on average, €48 more to their savings account(s) than those who did not receive any insight, and €77 more than those who received the neutral insight.

Yet, an insight triggering the fear of missing out did not increase the net savings balance of customers in our target group after the two-week experimental period. Net savings balance has two components: the amount transferred to and the amount withdrawn from the savings account. Next to driving the amount transferred to the savings account, our insight triggering the fear of missing out also unexpectedly led to an increase in the amount

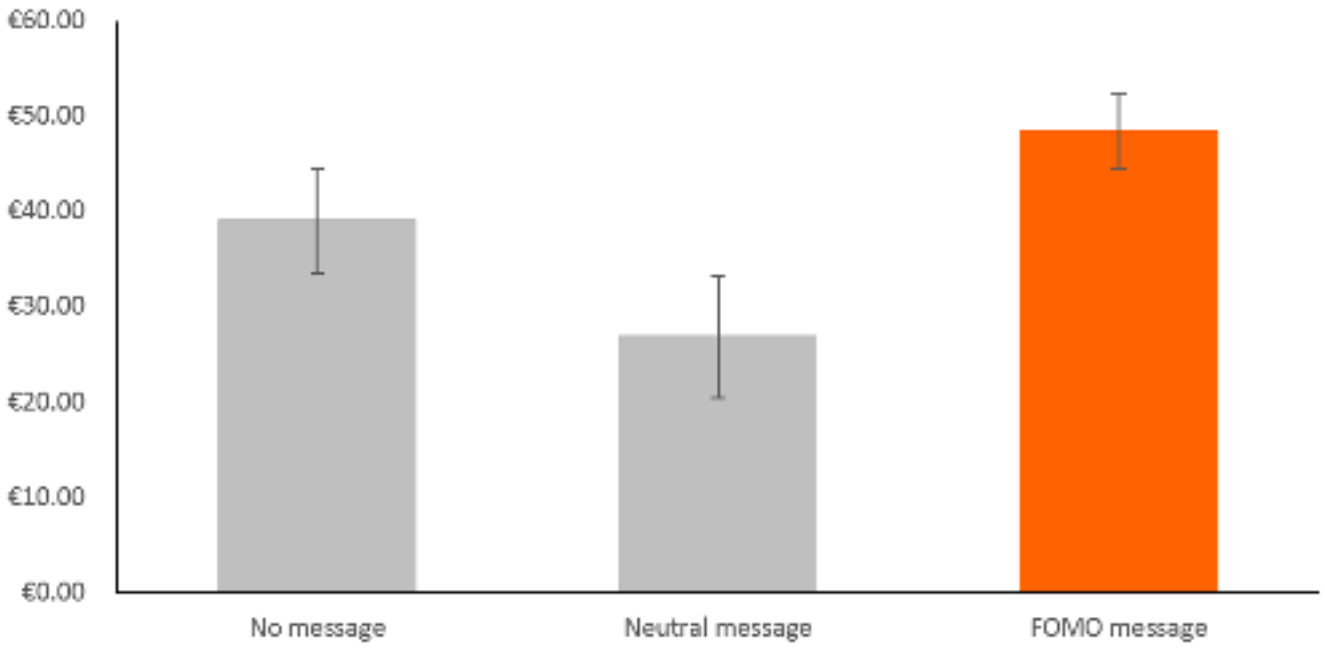

Figure 2: Net savings balance per condition in Experiment 1. *Note*: Error bars represent ± 1 standard error.

withdrawn from the savings accounts of our target group.[4] Although the FOMO insight suggested to people to save, linking the insight to future spending could have also activated a spending mindset. Further research is needed to validate this assumption. However, to prevent the activation of a spending mindset in the next experiment, we decided to test insights that did not relate to future spending.

Experiment 2: Saving a Little Adds up

The second experiment aimed to test a behavioural technique that shifts people's perception of saving: temporal framing. We believe that people with low savings are more likely to save when they believe it will not heavily reduce their spending power, and so we present saving as a series of granular, bite-size steps towards a larger goal. This aligns with previous research (Colby & Chapman, 2013; Hershfield et al., 2020), which varied in terms of whether the saving goal was represented as a monetary amount or a symbolic object (e.g. an iPad or a TV). Therefore, next to testing the role of different levels of temporal granularity, we also decided to test whether savings depend on the way the goal is represented.

Method

Participants. In total, 130,740 ING primary customers with less than €2,000 savings participated in our field experiment (M_{age}=39.81, SD_{age}=15.81, 48.4% male). Customers were randomly assigned to one of the five conditions in our 2 (Temporal reframing: €5 weekly vs. €20 monthly) × 2 (Goal representation: Monetary vs. Symbolic) + control (No insight) between-subjects design.

Procedure. The procedure was similar to that of Experiment 1. Customers in the four treatment conditions were shown an insight (at least once) after they logged into their banking app over a period of two weeks (see Table 2). In the No insight condition, customers did not receive an insight to save. In all five conditions, participants' savings were tracked over the two-week period in terms of the amount

[4] One-way ANOVA on the amount withdrawn: $F(2,123944)=31.584$, p <.01. Customers in the FOMO condition (M_{FOMO}=200.25, SD_{FOMO}=916.02) withdrew most money during the two-week experimental period, followed by customers in the No insight (M_{None}=161.38, SD_{None}=772.55) and the Neutral ($M_{Neutral}$=144.87, $SD_{Neutral}$=1432.23) conditions. All contrasts were significant (t's(123944) > 1.972, p's <.049). This means that customers receiving the FOMO insight withdrew, on average, €39 more from their savings account(s) than those who did not receive any insight, and €70 more than those who received the neutral insight.

transferred to their savings account(s) and the net savings balance at the end of this period (i.e. the amount transferred to their savings accounts minus the amount withdrawn). We identified 408 participants (0.3%) as outliers and removed them from the analysis.

Results

Amount transferred into savings account(s). A two-way ANOVA of temporal reframing and goal representation on the amount transferred by customers into their savings accounts showed no significant difference in temporal reframing

Table 2: Actionable insights per condition in Experiment 2.

and goal representation, or an interaction effect (*F's*(1,130327)< 1.996, *p's* >.158). An independent t-test was run on the amount transferred into savings accounts, comparing the No insight condition to all four treatment conditions, to test whether there was a general effect of temporal reframing. The results showed a significant effect (t(130327)= 12.983, p <.001; $M_{Treatment}$=277.38, $SD_{Treatment}$=691.51; M_{None}=214.02,SD_{None}=623.23). This means that all four insights presenting saving as small recurring steps motivated customers to transfer more money into their savings accounts. Thus, general reframing as a concept worked, but the level of temporal granularity (i.e. size of the saving step) and the different goal representations did not have the expected effect and worked equally well.

Net savings balance. A two-way ANOVA of temporal framing and goal representation on the customers' net savings balance showed no significant difference of temporal reframing and goal representation, or an interaction effect (*F's*(1,130327)< 0.483, *p's* >.487). An independent t-test was run on the net savings balance, comparing the No insight condition to all four treatment conditions, and showed a significant effect (t(130327)= 3.518, p =.010). This result indicates that an insight presenting savings as a granular activity ($M_{Treatment}$=44.11, $SD_{Treatment}$=834.53) had a significant positive impact on the

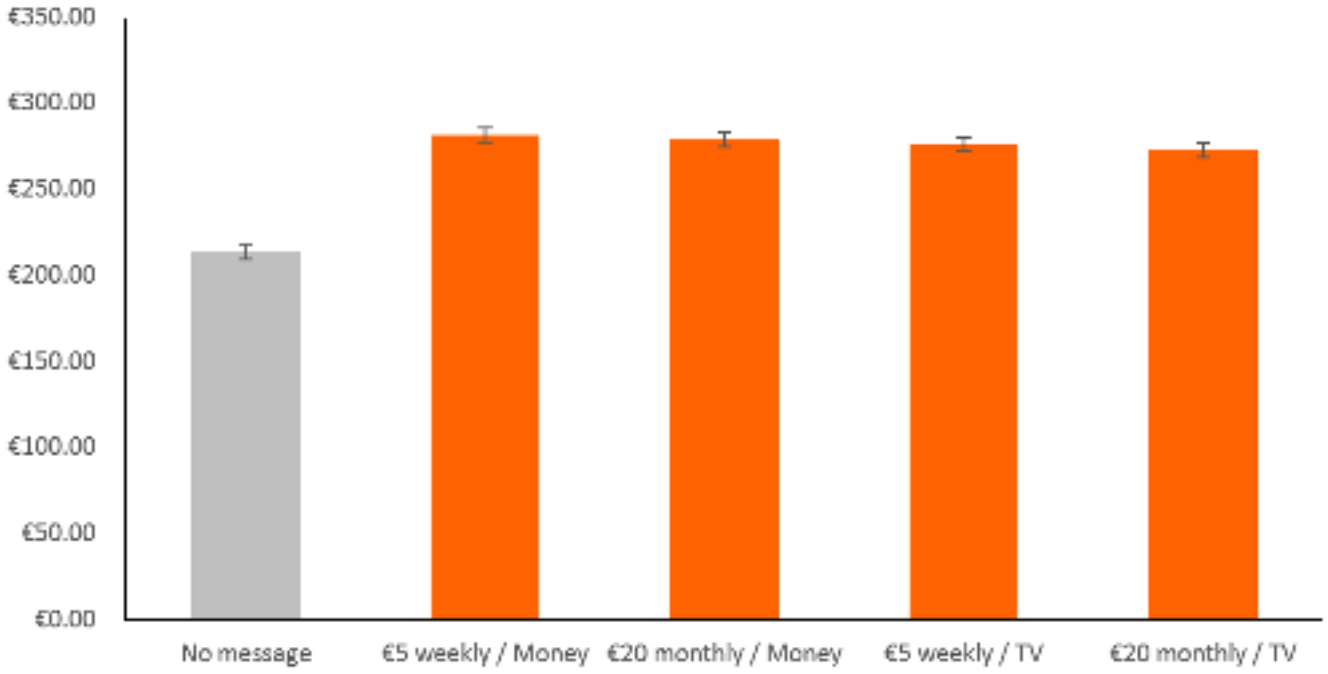

Figure 3: Amount transferred to savings account per condition in Experiment 2. *Note*: Error bars represent ± 1 standard error.

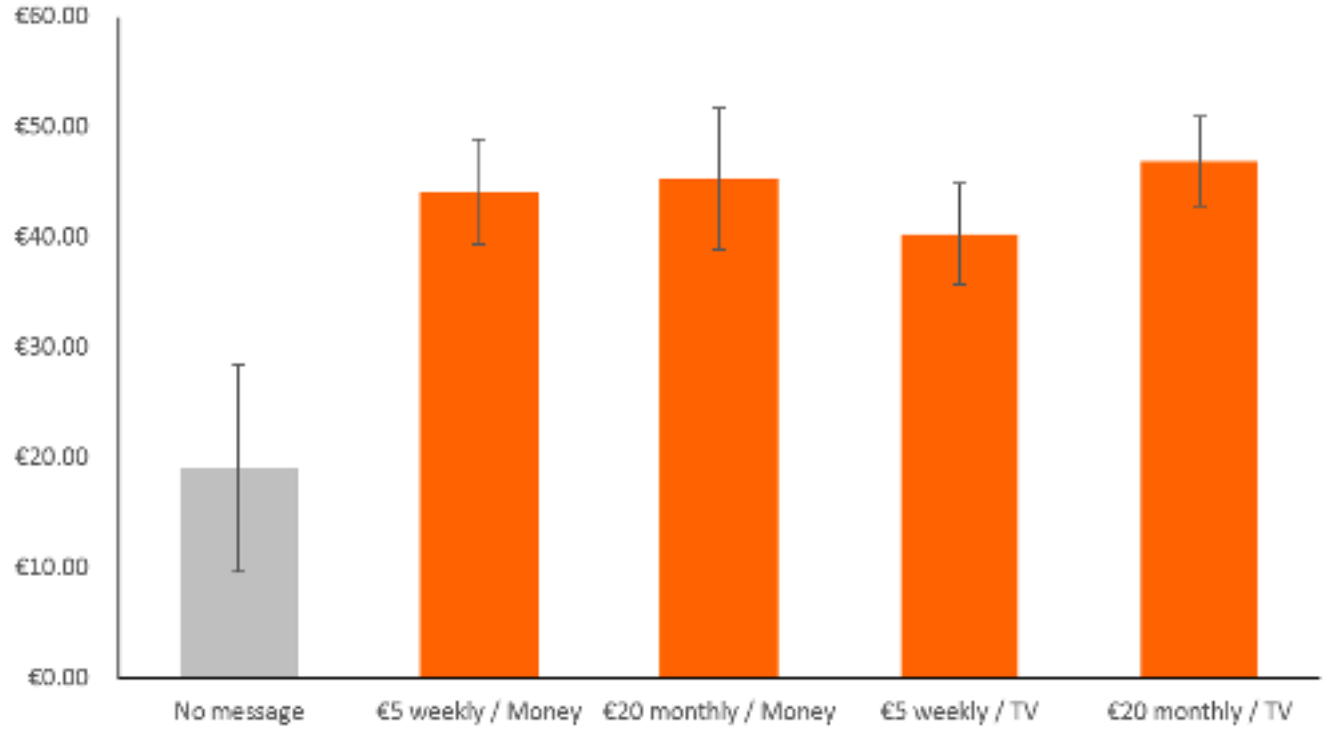

Figure 4: Net savings balance per condition in Experiment 2. *Note*: Error bars represent ± 1 standard error.

net savings balance of our target customers over the two-week period (M_{None}=19.01, SD_{None}=1327.21). Similar to the results for the amount transferred to savings accounts, all four insights presenting saving as bite-sized steps were equally effective in motivating customers to save more money.

Discussion

The results of experiment 2 indicate that reframing saving as small recurring steps has a positive influence on both the amount transferred into savings accounts and the net savings balances of ING customers with low savings. Compared to receiving no insight, customers who received one of the insights transferred, on average, €68 more to their savings account(s) and bolstered their net savings with €25 more. Although we aimed to unveil what level of temporal granularity would lead to most savings, in terms of both money transferred to savings accounts and increase in net savings balance, all the insights showed to be equally effective for different levels of temporal granularity (i.e. saving weekly or monthly) and ways to represent the saving goal (i.e. €250 or a TV).

General Discussion

We presented two experiments that aimed to help people with low savings build up a buffer. Targeting the right people and exposing them to actionable insights based on behavioural techniques in a natural environment, namely their banking app, was effective. Specifically, we found that activating the fear of missing out and presenting saving as small recurring steps motivated customers to transfer more money to their savings account(s), and that the latter also led to growth in net savings balance.

Whereas it is insightful to know what insights have a direct effect on behaviour (i.e. do customers take action?), the mere value of such insights for customers lies in the change they bring in terms of net savings balance over a longer period of time. One insight will not have the power to change savings behaviour consistently, but a range of targeted insights together will more likely do so. Therefore, besides the short-term contributions of a single insight to the amount transferred and changes in the net savings balance measured in our research, we believe it is crucial to analyse the increase in net savings balance over a longer period of time (e.g. a few months or a year) to understand the real value of actionable insights based on behavioural techniques for customers with low savings.

The findings of both experiments are in line with previous research (e.g. Abel et al., 2016; Hodkinson, 2019; Hershfield, 2020; Colby & Clapman, 2013). Our first experiment adds to the literature, as it shows that the fear of missing out can be valuable beyond its usual implementation. Although it is often used to increase sales, our findings also show that activating the fear of missing out could help people transfer more money to their savings account and build a buffer instead. Nonetheless, FOMO insights need to be used with caution, as people were also found to withdraw more money from their savings accounts when exposed to them. More research is needed to understand this outcome better.

The second experiment on temporal reframing is particularly valuable to the existing literature, as it measures real savings and not the intention to save. We found that breaking down savings into bite-size portions was effective in motivating people to save more, compared to people not receiving the insight. A neutral insight was not included, which could have determined the added value of temporal reframing over an insight by itself. In addition, we also need to acknowledge that we did not find the expected differences between the levels of temporal granularity. Our target group, namely people with less than €2,000 savings, might be more susceptible to smaller steps (e.g. saving per day). Future research would need to investigate these questions further.

Our research findings can be directly applied by ING. Not only did we help customers who were part of our experimental selections, but the insights can easily be scaled to other customers with little savings in the Netherlands – and potentially other countries. Cultural differences would need to be taken into account. Our research also has implications for other financial institutions, since it suggests that actionable insights based on behavioural concepts in general, and two techniques specifically, can be fruitful in driving saving behaviour. Consequently, we believe it is important that financial institutions join ING in the goal to improve people's financial health and help those with low savings to build a buffer.

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Increasing Retirement Savings in South Africa

*Natan Sklair**

Old Mutual

Upon leaving one's employer, many South Africans have one-off access to withdraw funds from their retirement pot. Despite being taxed, many use this opportunity to use these funds for immediate consumption, but they fail to plan appropriately and instead withdraw unnecessarily high values from their fund. Often, the chosen value is the result of naïve diversification. In order to increase the value of funds preserved for retirement, Old Mutual's Behavioural Economics Team designed a Randomised Control Trial (n=6207) to test the effectiveness of a behaviourally-informed contact centre conversation. The conversation used behavioural principles, such as framing and anchoring, to change members' decisions upon leaving their employer, from three options (full withdrawal, partial withdrawal and full preservation) to two options: full preservation or electing to take out a percentage of the fund, from 0% to 100%, as a withdrawal for an emergency cash need – while providing anchors of 5% and 10% as examples to the members.. A key result saw a 33%-point increase in the average proportion of funds preserved.

Introduction

When South Africans leave their employers before the age of 55, they have a one-off opportunity to withdraw a lump-sum from their employer-linked retirement fund[1]. Unfortunately, many fail to plan properly, and so they choose to withdraw unnecessarily high amounts. While access to these funds can be useful for meeting individual emergency needs, drawing down too much can negatively affect their wealth when they actually retire.

Old Mutual provides retirement fund options for employees of South African businesses. These employees are known as "members" of the fund. There are many ways in which a fund can be structured; however, the important point for this case study is that when a member leaves their employer, there is a value accessible to the member from which they can withdraw for present consumption.

Upon investigating trends relating to Old Mutual retirement fund members[2], it was observed that many withdraw approximately 50% of their available funds while keeping the rest in a preservation fund. One key hypothesis was that they were simplifying their decision by employing naïve diversification – a mental heuristic whereby individuals split their funds equally into the number of options available to them (in this case, preserve and withdraw) (Gigerenzer & Gaissmaier, 2011).

To reduce the value of funds withdrawn before retirement, Old Mutual's Behavioural Economics Team (BET) designed a randomised control trial (RCT) (n=6207) to test whether behavioural interventions would help members preserve their retirement funds for the future. By properly understanding the South African context, the individuals affected, and the structure of the organisation, the team was able to design a contact centre conversation for retirement fund professionals that would help Old Mutual members safeguard their retirement savings.

A key strategy in the intervention included chang-

[1] Different funds have different rules, and as of March 2021, the rules have been amended slightly; however, for the purposes of this reading, there is always a maximum withdrawal value available that can be withdrawn from a fund.

[2] Members are individuals who belong to the retirement fund. This can include either their employer standalone fund or Old Mutual's umbrella fund.

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ing the decision frame in a conversation with members, from choosing between three options (full withdrawal, partial withdrawal or full preservation) to two options: full preservation or electing to take out a percentage of the fund, from 0% to 100%, as a withdrawal for an emergency cash need – while providing anchors of 5% and 10% as examples to the members.

The key results from the intervention saw:

- A 33%-point increase in the average proportion of funds preserved for retirement (with 92% of the fund value preserved in the pilot test group)
- A 20% increase in the volume of funds preserved
- A 10% increase in the average NPS score[3]
- A successful rollout of the intervention across the organisation

Old Mutual's Behavioural Economics Team (BET)

The BET at Old Mutual was set up as an internal consultancy to assist the business with key challenges and to create opportunities for its customers, in order to improve their financial wellbeing.

The team has one goal, namely to apply behavioural economics across the organisation. In this way, it has the freedom to explore the entire business, without being siloed in one area. With access to 30,000 Old Mutual employees, and over 11 million customers across 14 countries, the team is well-placed to design interventions that make a difference at scale.

South Africa's Savings Problem

South Africa has one of the lowest household savings rates among developing countries, ranging between -2.31% and 0.2% over the course of 2010 and 2019 (OECD, 2020). Effectively, the metric has hovered around zero, but it has mostly been negative. In a country where the majority struggle to build wealth, and access to capital is limited, opportunities to increase savings rates are taken seriously. These low savings rates, if not improved, can negatively affect economic growth and place a financial burden on the government to provide for the elderly population (Ting & Kollamparambil, 2015).

Importantly, under apartheid, almost 90% of the population did not have access to resources such as jobs, capital and land. Therefore, for many families, the current generation is the first to have access to opportunities that can build wealth.

More recently, South Africa has seen an increase in what has been dubbed the "Sandwich Generation" (Old Mutual, 2019). This term refers to individuals who support both their younger family members (children, nieces, nephews, etc.), as well as older family members (parents, grandparents, aunts, uncles). With South Africa being one of the most consistently unequal countries in the world (Stats SA, 2019), initiatives that aim to improve national savings are particularly important.

Therefore, retirement savings play a key role in the country, as the funds are more difficult to access before retirement – especially when individuals fail to save via other financial vehicles[4]. However, South Africans are allowed to withdraw from their employer retirement fund if, before the age of 55, they leave their employer due to resignation, retrenchment or dismissal[5].

For some individuals, access to these funds offers welcome relief – especially if they are entering a period of income uncertainty and require addition-

[3] NPS stands for "Net Promotor Score." Customers are asked, "How likely are you to recommend us to a friend or colleague?" on a zero-to-ten scale. The NPS is the percentage of customers who are promoters (those who scored 9 or 10) minus the percentage who are detractors (those who scored 0 to 6).

[4] For the employed population, pension and provident fund options are commonly provided through their employer. These funds can be structured in different ways depending on the employer, but are most typically a compulsory plan where the employee selects a percentage of their pre-tax monthly salary toward their retirement savings.

[5] Until 1 March 2021, South Africans could withdraw the full value of these funds, and an appropriate tax would be applied. However, since 1 March 2021, the amount accessible for withdrawal by individuals has become limited (Old Mutual, 2021).

al funds. However, our findings suggest that many individuals fail to budget properly for their future during this process, and they end up withdrawing unnecessarily high amounts from their retirement fund.

Understanding the Affected Individuals

Essential to the success of the project was the approach taken by the team, investing time in understanding the affected members, their journeys, and consolidating the relevant behavioural economics tools that might apply to their decisions.

To understand behavioural barriers, the team employed a series of methods, each with their own objective:

1. Mapping out the full member decision journey, from the time the member joins their employer, to the time they leave their employer
2. Reviewing all existing communications sent out to Old Mutual fund members
3. Listening to live and recorded calls
4. Conducting interviews with stakeholders across the affected areas of Old Mutual
5. Mapping out the different areas of the business affected
6. Analysis of the data to understand the core problem and possible target area
7. Customer feedback

By creating an in-depth decision map for each type of member exit (resignation, retrenchment and dismissal), the team was able to map discrete choices along the decision path to making sound financial decisions regarding savings. Combined with a clear understanding of the decision context, this allowed the team to expose gaps in the existing process/approach.

Importantly, members effectively have three options when it comes to their retirement fund decision when they leave their employer. They can:

1. Withdraw the full value of their fund
2. Withdraw part of their fund, and preserve the rest in a preservation fund
3. Preserve the full value of their fund in a preservation fund (the member defaults to full preservation if no decision is made)

Once the team understood the environment, the qualitative and quantitative data aligned to tell a clear story. That is, members were taking out money because:

- They had no other resources to provide them support
- They were unaware of their alternative options for emergency cash needs
- They were not considering exactly how much they needed for immediate consumption, leading them to withdraw an amount that was larger than necessary

Regardless of personal context, members going through an exit process may be experiencing a great deal of uncertainty or financial stress despite some of them moving to new employment. Among the three broader reasons for withdrawing from one's retirement fund, a number of behavioural factors were also identified as barriers to better savings decisions.

The Timing of the Decision Was Critical

Members effectively had one major decision point regarding their retirement fund: a phone call confirming their final decision on their retirement plan (point 3 in Figure 1, below). Despite being able to complete a form prior to a conversation with a retirement fund professional, many members are only confronted with their need to make a decision on receipt of a call conducted by a retirement fund professional.

Using the 1/N Heuristic to Plan for Retirement

Looking at the data for members who had partially preserved their funds, the team noticed that people were, on average, withdrawing just under 50% of their fund value. This (almost) equal split led to the hypothesis that, upon needing to make a decision, many members were subject to naïve diversification, i.e. splitting their withdrawal and preservation

in half, because it simplified the decision. This is consistent with the theory put forward by Gigerenzer & Gaissmaier (2011), also known as the "1/N heuristic," whereby individuals tend to assign equal weight to the alternatives available to them.

Mental Accounting to Justify Early Withdrawals: A Clear Case of Hyperbolic Discounting

Despite being subject to strong tax penalties for early withdrawals (up to 36% of the fund value), many members were willing to trade off the future value of their fund for present consumption. Our research showed that members often thought of their fund value as the post-tax fund value, i.e. the amount available to spend, and they struggled to think about themselves at retirement. This observation is a classic case of hyperbolic discounting, whereby individuals confronted with the choice hold a preference for a smaller level of consumption in the present period while trading off a higher level of consumption in the future (Laibson, 1997).

Therefore, it appeared that members were performing some mental accounting by thinking of access to their funds as a pool of income relative to their present consumption needs –rather than calculating their needs accurately (Thaler, 1999). Members were allocating some of their retirement funds to the here and now rather than the intended future purpose of income at retirement – despite having access to the calculations that would allow them to view their potential future fund value. This is congruent with the behavioural life-cycle hypothesis, whereby wealth is assumed to be divided

Figure 1: Key touchpoints in the member decision journey.

into three mental accounts: current income, current assets and future income (Shefrin & Thaler, 1988).

Lack of Salient Alternatives

As some members were entering a period of financial uncertainty, especially those who had been dismissed or retrenched, an urgent need for cash could have been justified. However, upon investigation, many members were unaware of the alternative financial solutions available to them when withdrawing from their retirement fund that could help them with their immediate financial needs.

The Intervention

To improve member decision-making, the team designed a behavioural intervention aimed at improving their future retirement savings. Having identified the conversation with the retirement professional as the primary member decision point, the team designed a conversation blueprint for retirement fund professionals. In addition to the conversation blueprint, the team also changed the form to reflect the options presented in the behaviourally-informed conversation; however, the form was excluded from the trial.

Figure 2, below, summarises the main behavioural economics principles used in the conversation blueprint, in order to address the challenges identified at the outset of the project.

Given that people tend to revert to simple heuristics, or mental shortcuts, when making decisions in uncertain situations (Tversky & Kahneman, 1974), the behavioural principles used in the intervention simplified the decision-making process by either

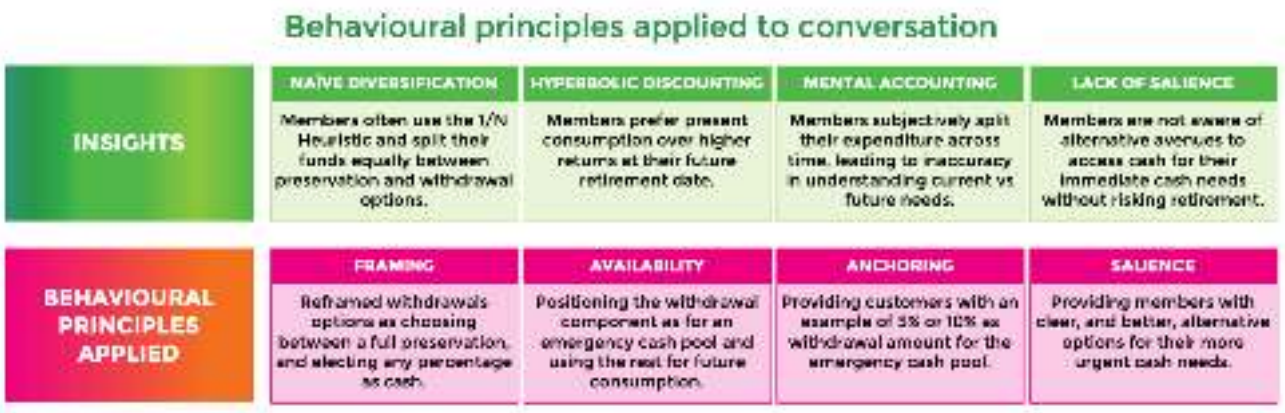

Figure 2: Behavioural principle applied to the conversation blueprint.

accounting for or taking advantage of these heuristics. Expanding on Figure 2, below is a description of how the key behavioural principles were used in the intervention.

- **Framing:** In the original conversation/decision, members had three options (fully preserve, partially preserve, full withdrawal). **The new, behaviourally-informed, conversation provided only two decision options to the member: full preservation or elect to take a percentage of the fund, from 0% to 100%, as a withdrawal.** By presenting the option slightly differently, members were encouraged to think about each percentage of the fund that they would need to withdraw.
- **Availability heuristic:** Knowing that individuals tend to make judgements based on how easy an example comes to mind (Botha et al., 2014), it was clear that members would often struggle to think of an example for actually using the withdrawn money despite intending to make the withdrawal anyway. The updated conversation provided a clear reason for the withdrawal portion, that is, "an emergency cash need."
- **Anchoring:** The conversation provided 5% or 10% as an example of how much to withdraw for emergency cash needs. Combined with framing, the hypothesis was that the anchoring effect would counteract the naïve diversification observed in member behaviour.
- **Salience:** As members may not realise they have other options if they urgently need funds, the script included questions regarding the main financial concern. Once established, the retirement fund professionals were able to provide members with a list of alternative solutions that could help them meet their immediate needs.

In addition to the above principles, the team employed other methods in the conversation, including changing the order in which the options were presented to the member (presenting full preservation as the first option), simplifying and shortening the wording in the conversation, having the more important conversation upfront and using social norms as a guide.

Implementation of the Intervention

There were three key components to the intervention:

1. Scripting a behavioural economics-informed conversation embedded into the system
2. Designing conversation cue cards, to increase the salience of key conversation points
3. Upskilling the retirement fund professionals

To ensure sustained development in the contact-centre environment, the team shifted away from the traditional approach of simply training agents on the new script. Instead, they focused on encouraging the agents to adopt a new, behaviourally-informed way of thinking – ensuring the agents internalised the behavioural principles.

To this end, the training process, which was conducted using a combination of prompt cards and a behavioural toolbox, involved group sessions, role-

play, dry runs with the management team, live and recorded call listening (with feedback) and ongoing one-on-one coaching, which was finally handed over to the retirement fund professional management team.

Testing the Intervention & Key Results

To test the effectiveness of the intervention, the team set up a randomised control trial (n=6207). The RCT consisted of splitting the sample of members into two groups: the first would receive a behaviourally-informed conversation, while the second received the existing, business-as-usual process. This was achieved by only assigning one group of retirement fund professionals the additional training and material that included the behavioural economics principles for the new conversation. Both groups of agents had similar levels of experience and previous training.

The pilot ran for six weeks and captured 6,207 customer interactions. Using a difference-in-difference approach, the final results saw:

- A 33% point increase in the average proportion of funds preserved for retirement (with 92% of the fund value preserved in the pilot test group)
- A 20% increase in the volume of funds preserved
- A 10% increase in the average NPS score

One result that stands out most significantly is the change in the average proportion of funds preserved. While the team did not test each behavioural technique individually, there is a strong argument to be made that members were previously using the 1/N heuristic to make their partial withdrawal decisions. Providing members with anchor points, and prompting them to think about each percentage point withdrawal, allowed them to be more conscious about their thinking and make more future-orientated decisions.

Following the success of the pilot, the intervention was then rolled out to the rest of the relevant business unit. Importantly, the pilot demonstrated a convincing success for the business. From a behavioural capability-building perspective, this allowed the team to increase its legitimacy within the organisation and pursue the ongoing expansion of their role and influence.

Reflections on the Intervention

Since conducting this study, as of 1st March 2021, the South African government has changed the percentage of funds available for withdrawal upon leaving one's employer. While this will help South Africans maintain a higher value of their funds for income at retirement, they will still be subject to the same challenge, should they leave their employer. In other words, despite the percentage of funds from which one can withdraw being smaller, people will still be subject to the same temptations and biases when faced with a similar decision.

Therefore, there were two key lessons from the intervention. First, individuals' environment and context at the point at which a decision is made are important contributors to retirement savings outcomes. That is, despite financial planning, or a lack thereof, the conversation with members appeared to be highly influential in one's retirement fund decision-making. This means that measures ought to be put in place to ensure that these conversations account for the mental biases and heuristics that fund members may be experiencing when the decision is made.

Firms responsible for conversing with members with regards to their retirement fund upon leaving their employer are encouraged to employ similar behavioural principles in their conversations or relevant decision points.

Second, part of the success of the intervention is attributed to the training provided to the retirement fund professionals – the ones taking the calls with the members. The key lesson here was developing a training programme that would allow them to internalise the behavioural principles – rather than simply being exposed to them. By immersing the professionals in behavioural economics, and providing them with consistent feedback, they were able to account for any sudden or unexpected changes to the flow of the conversation with members.

Ultimately, the intervention conducted by Old Mutual's Behavioural Economics Team highlights

the importance of addressing the target or problem behaviour at the points which matter most to the final decision, together with the people who are most influential in interacting with the affected individuals.

The Author

Natan Sklair leads Old Mutual's Behavioural Economics Team. Since 2016, he has been applying behavioural economics across both the private and public sectors in Africa and the UK. Since joining Old Mutual in 2017, Natan has helped grow a team that provides behavioural economics consulting services to the entire group. The team delivers projects on external, customer, internal and employee outcomes. Natan has a Masters in Applied Economics from the University of Cape Town.

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Nudging to Improve the Timely Payment of Loans: Results of a Natural Field Experiment

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Quadrangle Consulting Services

At the commencement of this study, ~31.5% of customers of DMI Finance, an Indian B2B non-banking financial company (NBFC), had failed to repay their loans on time. We used insights from the literature on biases, heuristics and nudge theory to positively influence customers' payment behaviour. We created persona-linked, personalised communication to increase awareness about payment processes, to make call-to-action links easily accessible and to provide education about the consequences of delays. The intervention led to an increase of 7% - 11% in the timely repayment of loans in the experimental groups. It also reduced delinquency on average by 2 days a month.

Introduction

India's per capita income is estimated to increase to US$ 3,500 by 2024 (a FICCI NBFC Committee Report, 2020). Movement of the population to higher-income categories, a rise in the working age population to ~1200 million by 2031, the rampant spread of mobile usage and technology will drive both consumption in the economy and associated credit need. While traditional banks certainly consider risk in servicing the ~147 million creditworthy customers currently under the age of 24 years, DMI Finance has designed financial products for this underserved segment of society. With better data utilisation and unique risk underwriting, it has harnessed the opportunity to provide low-value, unsecured loans to these customers.

DMI Finance acquires customers through multiple digital partner apps. Once the customer is deemed eligible for a loan, disbursement communication is led by DMI Finance, as is management of the customer's journey and the collection of debt. Given that average unsecured loan amounts are as low as INR 5000 (~ US$ 68), the cost involved in servicing customers is kept low by leveraging the digital medium to manage customers' journeys. At the commencement of this study, despite DMI Finance's robust customer communication program, which includes text messages (SMS), e-mails and on-call assistance via the company's service centre, ~31.5% of customers had failed to repay their loans on time, thereby endangering their own credit scores and in turn their chances of qualifying for further loans.

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Our Approach

Human behaviour is partially driven by reasoned, deliberate cognition and partially by prior experiences, inherent biases and heuristics. This study explores the use of nudges to counter some of these biases and to influence customers' behaviours, using our context-agnostic and experiment-led 4-D methodology.

D1 – Diagnose

The diagnosis phase included the collection of information around default patterns through data reviews and meetings with internal teams, from customer success, credits, collections and IT, to data science. Qualitative insights from interviews were cross-referenced against data taken from DMI Finance's CRM platform, customer service centre records and website analytics, in order to review demographic indicators (education, age, gender,

Figure 1: 4-D Methodology.

history of borrowing, location, etc.), patterns of payment delays, the nature and frequency of queries and complaints raised by customers, etc. A customer journey map (CJM) was created to highlight critical engagement points between the customer and DMI Finance. A combined review of the CJM and the data led to the discovery of critical gaps in customer communication:

- **Missing & Complex Communication:** Communication was irregular and not present at critical journey points. Messaging via SMS and E-mail was complex, and it used mature banking terminology that was not congruent with the financial experience of the customer profiles.
- **Fragmented & Inconsistent Communication:** Different digital platforms did not provide consistent information, thus adding to the call volume burden at the customer service centre.
- **Missing Education:** Customer education material was missing from the journey points.
- **Misaligned Positioning:** Customers were onboarded via a partner app and were unaware of their relationship with DMI Finance. Information from both sources was often found to be overlapping and conflicting.

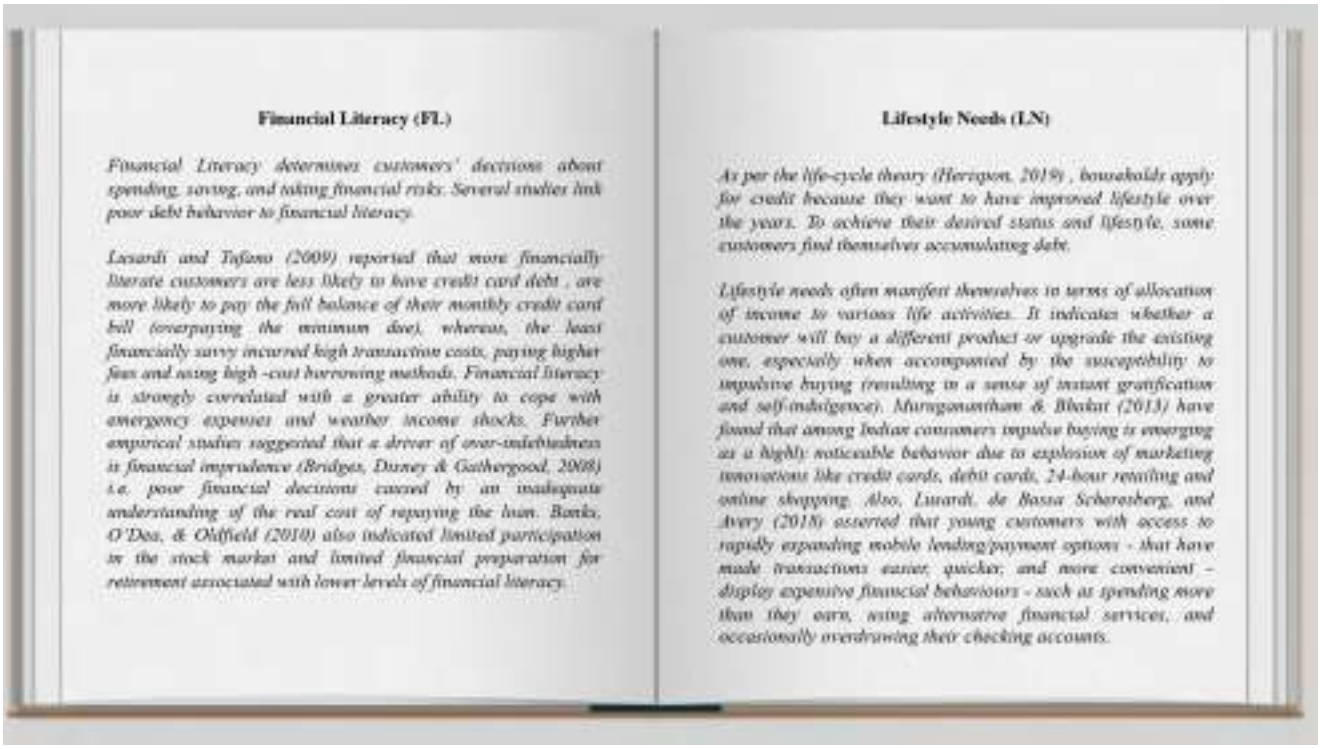
It was hypothesised that:

1. Payment delays and defaults can be reduced by creating awareness about the payment process, ensuring accessibility to call-to-action payment links and blending education on the consequences of missed payment.
2. Timely payment can be encouraged with more personalised communication to different customer segments, thus addressing specific barriers to repayment.
3. Cost to service via the customer service centre can be reduced by refining and promoting simple, digital self-service channels.

D2 – Discover Persona

Effectively communicating with customers about repayment, saving and attitude to financial planning required unearthing the drivers of borrowing debt, repaying loans and the relationship between lifestyle needs and money. A literature review (Figure 2) revealed the influence of financial literacy (FL) and lifestyle needs (LN) on customer repayment behaviour.

We identified the specific pillars of FL and LN from the literature to aid the study. Interactions



Financial Literacy (FL)

Financial Literacy determines customers' decisions about spending, saving, and taking financial risks. Several studies link poor debt behavior to financial literacy.

Lusardi and Tufano (2009) reported that more financially literate customers are less likely to have credit card debt , are more likely to pay the full balance of their monthly credit card bill (overpaying the minimum due), whereas, the least financially savvy incurred high transaction costs, paying higher fees and using high -cost borrowing methods. Financial literacy is strongly correlated with a greater ability to cope with emergency expenses and weather income shocks. Further empirical studies suggested that a driver of over-indebtedness is financial imprudence (Bridges, Disney & Gathergood, 2008) i.e. poor financial decisions caused by an inadequate understanding of the real cost of repaying the loan. Banks, O'Dea, & Oldfield (2010) also indicated limited participation in the stock market and limited financial preparation for retirement associated with lower levels of financial literacy.

Lifestyle Needs (LN)

As per the life-cycle theory (Herrgon, 2019) , households apply for credit because they want to have improved lifestyle over the years. To achieve their desired status and lifestyle, some customers find themselves accumulating debt.

Lifestyle needs often manifest themselves in terms of allocation of income to various life activities. It indicates whether a customer will buy a different product or upgrade the existing one, especially when accompanied by the susceptibility to impulsive buying (resulting in a sense of instant gratification and self-indulgence). Murugesanthan & Bhakat (2013) have found that among Indian consumers impulse buying is emerging as a highly noticeable behavior due to explosion of marketing innovations like credit cards, debit cards, 24-hour retailing and online shopping. Also, Lusardi, de Bassa Scheresberg, and Avery (2018) asserted that young customers with access to rapidly expanding mobile lending/payment options - that have made transactions easier, quicker, and more convenient – display expensive financial behaviours - such as spending more than they earn, using alternative financial services, and occasionally overdrawing their checking accounts.

Figure 2: Literature reviewed on financial literacy and lifestyle needs.

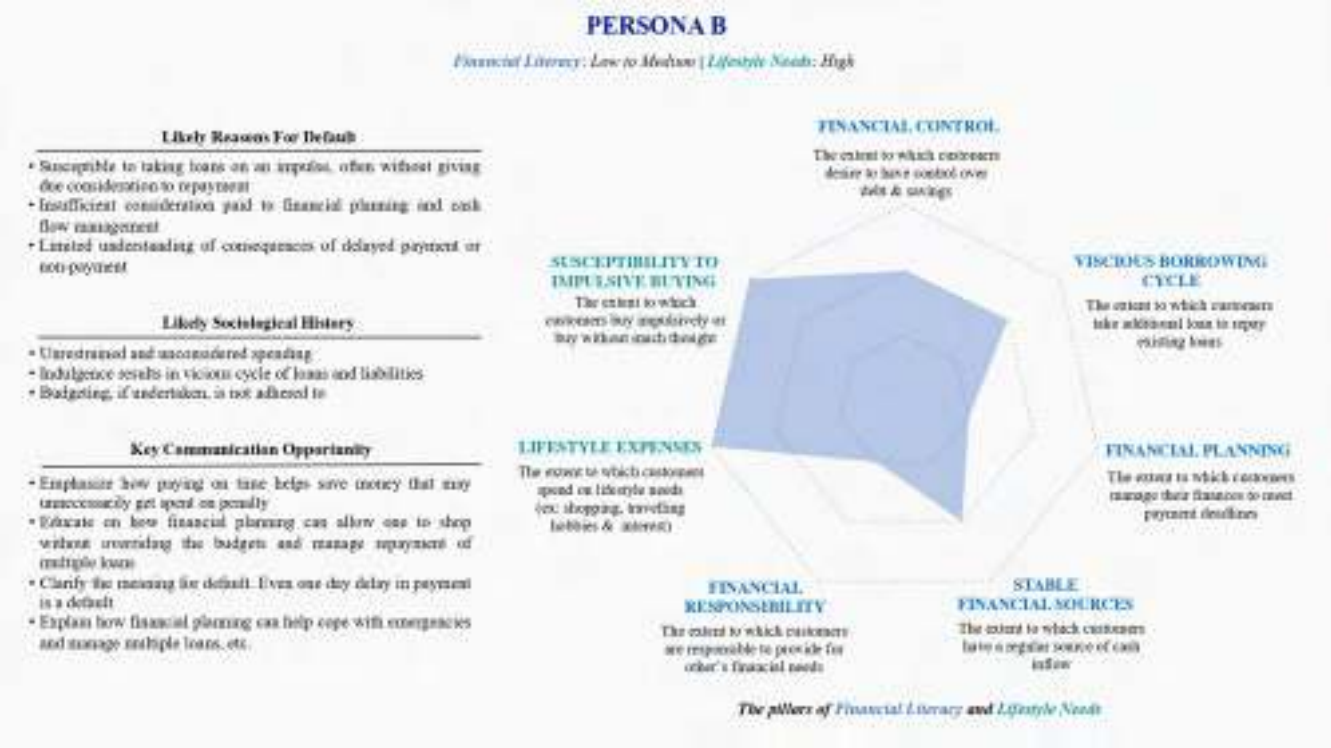


Figure 3: Sample illustration of one of the five personas.

between these pillars create five distinct customer personas – personas A, B, C, D and E. For each persona, possible barriers to repayment were averred. Level 1 barriers emerged due to a lack of sufficient and clear information about interest rates, late fees, the consequences of non-payment, etc. These were not distinct for different personas. Level 2 barriers surfaced due to distinct interactions between customers' FL and LN, creating unique payment and default patterns that emerged from their unique motivations.D3 – Design

We designed an integrated customer communication programme, using the three critical levers (Figure 4) to nudge customers to pay on time and leverage self-service digital channels by:

1. Creating a profiler form for the segmentation of customers, in order to personalise communication.
2. Deploying nudge-based text messages (SMS) for consequence education, payment reminders, accessible links to self-service digital channels, etc.
3. Refining communication and user design across the websites, portal, e-mail and education videos, to promote self-service.

Design outcomes

Segmentation of customers, using the profiler form

The segmentation of customers into the five personas was achieved via a profiler form that was tested on 7,714 customers in two phases. The form consists of 11 scorable multiple choice questions mapped to FL and LN. Based on the scores, a customer is classified into high, medium or low segments in relation to FL and LN. Together, the categories culminate in the five personas. If customers do not answer all or none of the questions, they are assigned persona E. Once customers are segmented into one of the five personas, a tailored SMS series is triggered.

Nudge-based text messages (SMS)

SMS forms an important tool for customer communication, especially in India, where there are ~713 million cellphone subscribers. SMS content was repurposed as a nudge and linked to specific journey points. It included reminders to address availability bias, deadlines to counter information avoidance, default payment options to tackle

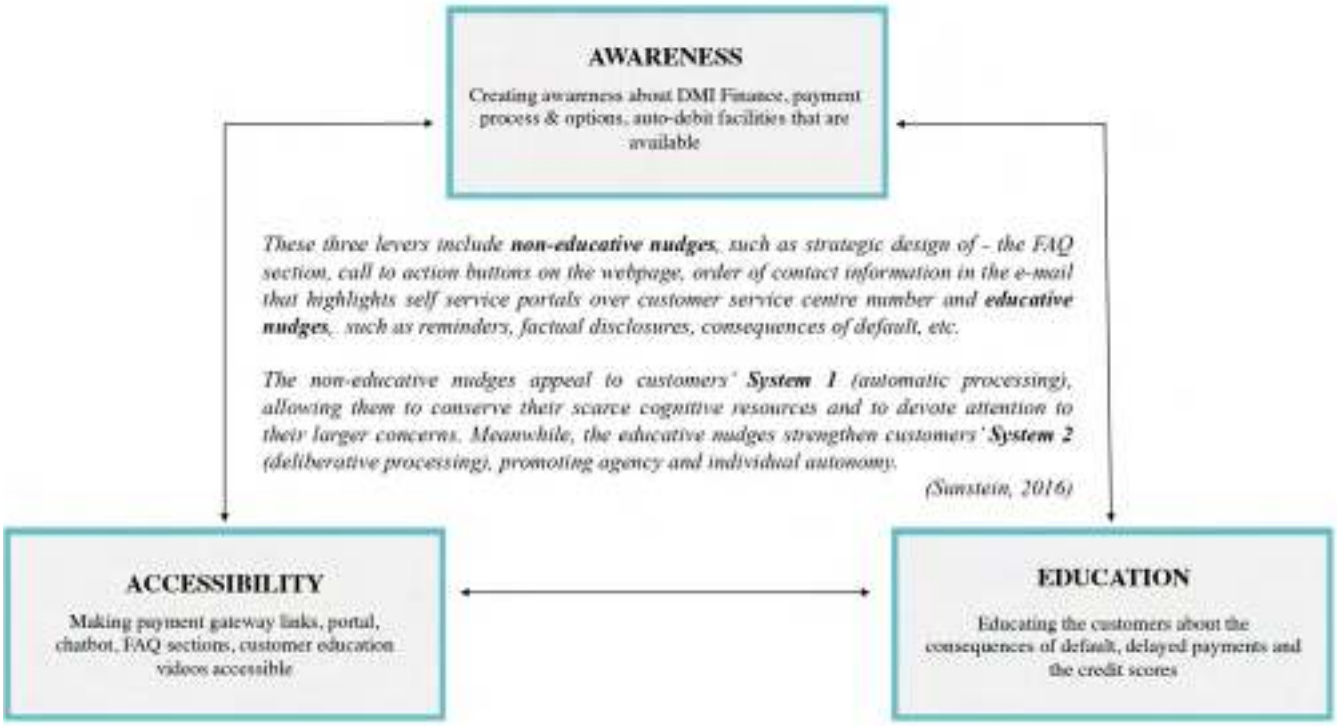


Figure 4: The three critical levers of design.

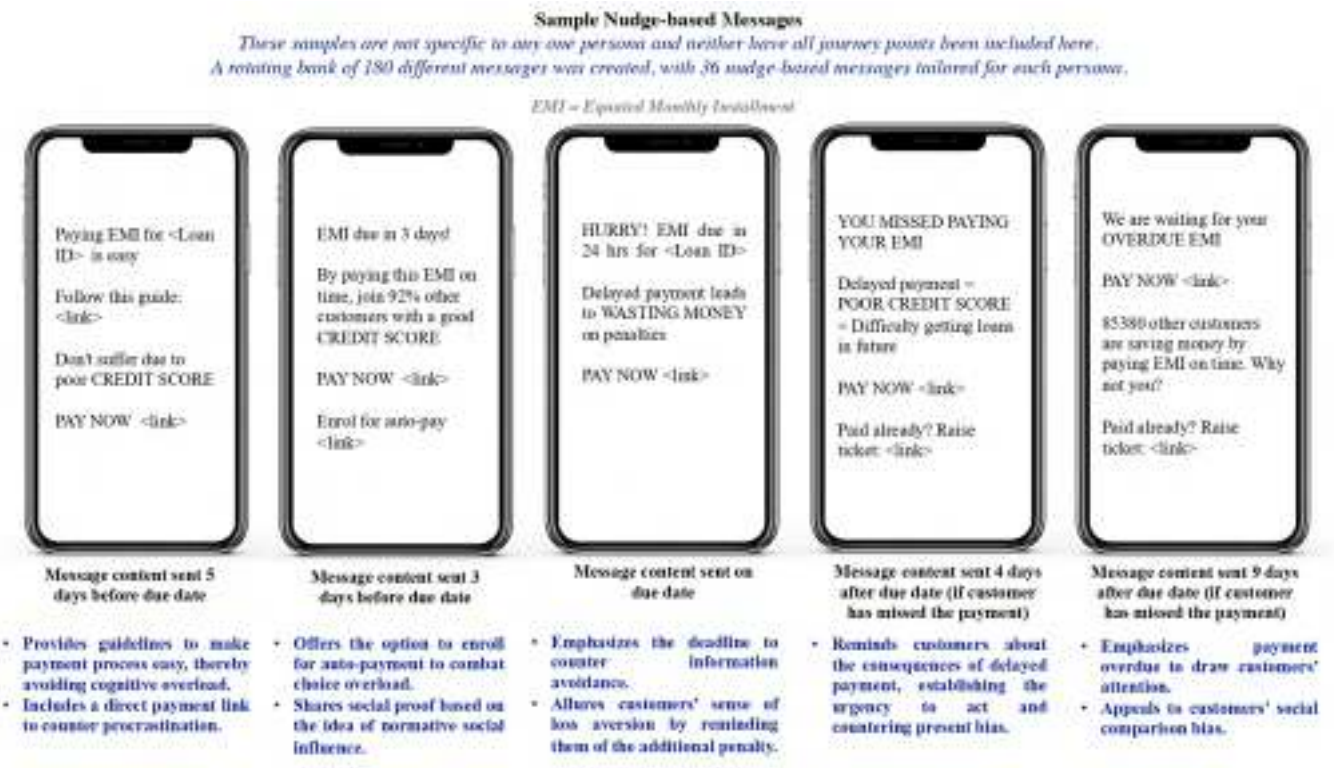


Figure 5: Nudge-based SMS.

choice overload and direct payment links to counter procrastination and to reduce switching costs. The nudges were designed to either reinforce timely repayment behaviour through the use of positive strokes or undermine defaulting behaviour through the use of social proof and expression of disappointment. SMS design was constrained within the 160-character limit.Refining communication and user design across digital channels

E-mails. Nearly 73% of the customers called the service centre more than once to seek resolution to a query that was previously resolved via e-mail communication. We rephrased contractual/technical information used in the e-mails and redeveloped the e-mail template to enhance its visual appeal and simplicity, to ensure the following critical information was addressed by the customers:

- Loan ID
- Contact information (sequenced such that the portal was prioritised over the customer service centre information)
- Call-to-action link to the FAQs page on the website
- Standard operating time taken to update records (since nearly 27% of the call centre volume was generated from assumed delays in system updates)

Website and portal. All information pertaining to payment and self-service options were standardised across the communication channels. Structural and navigational changes were introduced that included rewording of the FAQ section to reflect customers' vocabulary (limiting friction for customers when they use a custom search), the clustering of queries based on their similarity, placing frequently asked questions at the top of the page and arranging the navigation buttons to the left, since research suggests viewers spend 80% of their time viewing the left side of the screen (Therese, 2017).

Education videos. Five videos were created to encourage customers to pay on time and adopt the self-service digital channels. Videos were inserted at various points in the customers' journey, namely on-boarding, first EMI payment, subsequent payment and once when all EMIs are paid.

D4 – Deploy

Pilot and results

It is reasonable to believe that when customers contact lending partners, they do so with the intention of repaying the loan; yet, some do not follow through on their intentions. This intention-action gap, or the discrepancy between what people claim they will do and what they actually do, provides a fertile window for behavioural change.

The study tested the efficacy of using various

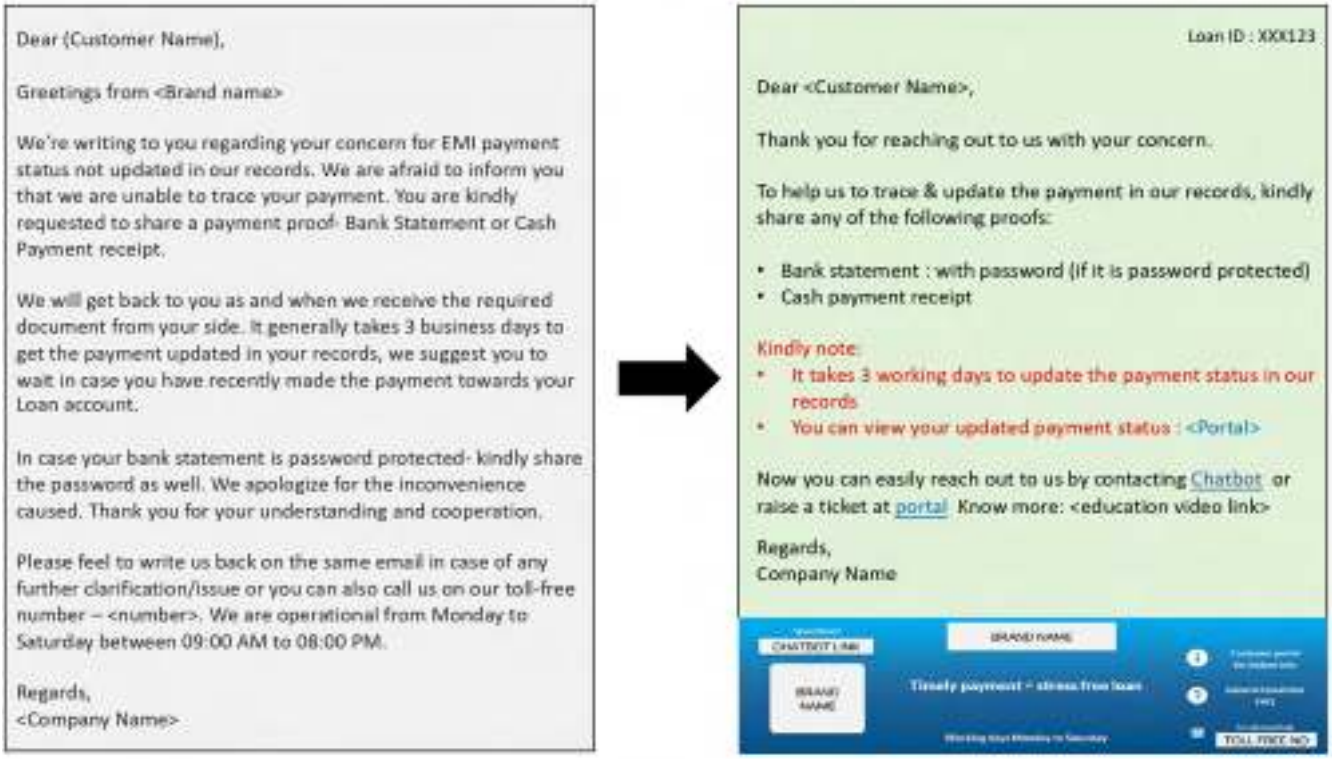


Figure 6: Sample refined e-mail template.

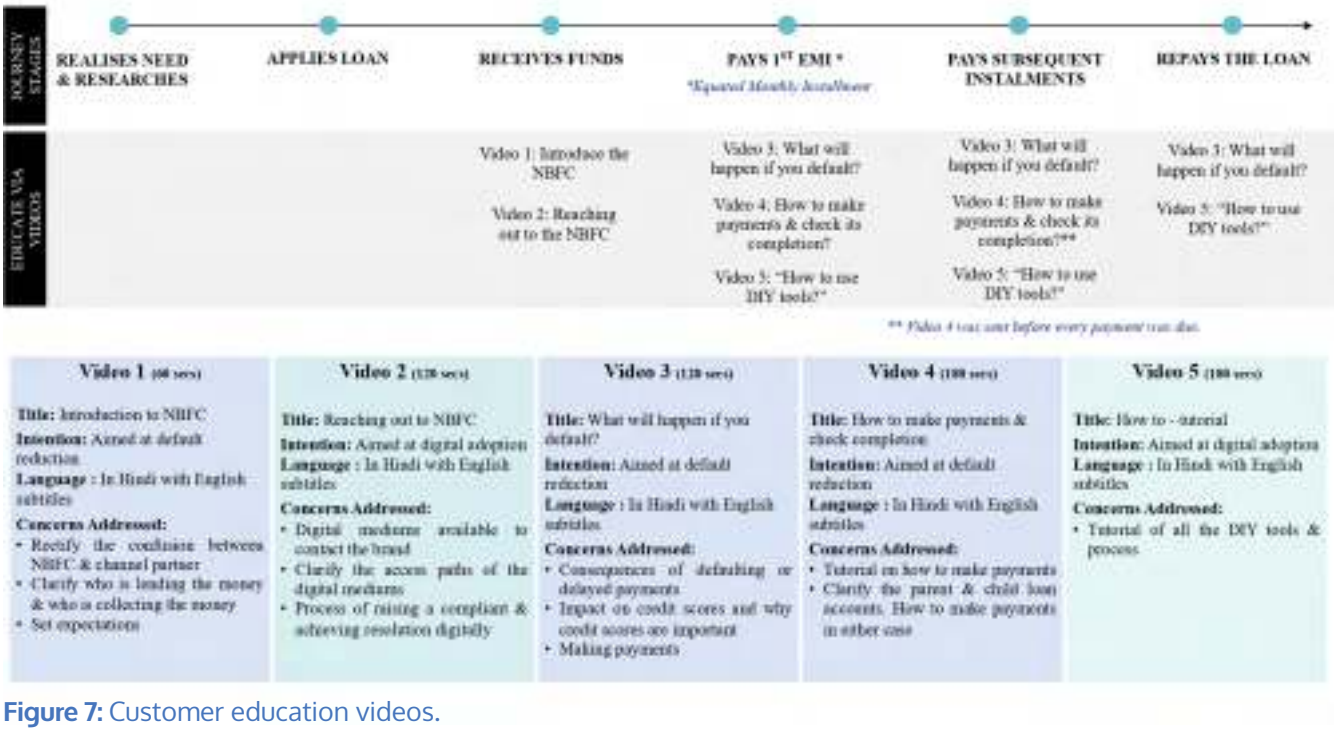


Figure 7: Customer education videos.

Objective of the pilot	To test if the newly designed SMS series nudges customers to pay on time			To test if the newly designed SMS nudges customers to use self - service digital channels over calling the customer service centre for basic queries
Customer Segments	**Segment A**	**Segment B**	**Segment C**	**Segment D**
Characteristics	• Have a history of default • Have 6 or more EMIs to pay	• Newly onboarded customers with no history of default • Have 6 or more EMIs to pay	• Have a history of default • Have 6 or more EMIs to pay • Penalty for delay or default in payment	• Have called the customer service centre for basic queries • Have 6 or more EMIs to pay
Sample Size	4535 customers	838 customers	9968 customers	4192 customers
Control Group *Received existing (old) SMS*	2268 customers	419 customers	4984 customers	2092 customers
Experimental Group *Received new SMS series*	2267 customers	419 customers	4984 customers	2100 customers
Period of experiment	3 months	3 months	3 months	3 months

Table 1: Pilot – customer segments.

nudges as almost cost-free methods (Jensen et al., 2018) for improving timely loan repayment and encouraging the use of digital channels for self-service, without attaching a substantial financial reward or penalty to the process. Pilots were conducted on four segments of customers to test two hypotheses, wherein control groups received regular SMSs, and experimental groups received newly designed nudge-based Persona E SMSs (since a majority of customers in the profiler form testing phase were segmented into Persona E). Hypothesis 1– The new SMS series will nudge more customers in the experimental group to pay on or before time, compared to customers in the control group.

To test hypothesis 1 across segments A, B & C, a chi-square test of independence was performed in both groups to examine the relationship between making repayments and receiving messages.

Nudge-based SMS effectiveness was evaluated under three circumstances:

- A – when customers had a previous default history and had experienced "consequences of defaulting"
- B – when customers were newly on-boarded and thus had no default history
- C – when customers received messages in the presence of a penalty

Segment A

Overall, 772 (11%) more customers paid on time in the experimental group than in the control group. Significantly more customers paid on time in the experimental group as compared to the control group in month 1 (31% vs 23%, X^2 [1, N = 4535] = 38.12, p < .001), month 2 (32% vs 25%, X^2 [1, N = 4535] = 29.27, p < .001) and month 3 (32% vs 25%, X^2 [1, N = 4535] = 31.89, p < .001). Hence, the results support hypothesis 1.

Segment B

Overall, 87 (7%) more customers paid on time in the experimental group than in the control group. This difference, however, was not found to be significant between the experimental group and the control group across month 1 (47% vs 41%, X^2 [1, N = 838] = 3.27, p = .07), month 2 (53% vs 48%, X^2 [1, N = 838] = 1.72, p = .19) and month 3 (58% vs 51%, X^2 [1, N = 838] = 3.25, p = 0.07). Hence, the results do not support hypothesis 1.

Segment C

Overall, 17 (<1%) more customers paid on time in the control group than in the experimental group. Significantly more customers paid on time in the experimental group as compared to the control

Segment A	CONTROL GROUP (N = 2268)					EXPERIMENTAL GROUP (N = 2267)					DUE DATE PAYMENT TRENDS
	SUPER EARLY PAYERS	EARLY PAYERS	DUE DATE PAYERS	LATE PAYERS	SUPER LATE PAYERS	SUPER EARLY PAYERS	EARLY PAYERS	DUE DATE PAYERS	LATE PAYERS	SUPER LATE PAYERS	
Month 1	6.70%	1.01%	15.52%	6.79%	69.97%	2.96%	1.72%	26.73%	4.59%	64.01%	11% increase in due date payment in experimental group
Month 2	7.76%	1.19%	15.83%	7.28%	67.95%	3.13%	1.81%	27.08%	4.76%	63.21%	11% increase in due date payment in experimental group
Month 3	7.85%	1.10%	15.56%	7.50%	67.99%	3.53%	1.37%	27.17%	28.01%	39.92%	12% increase in due date payment in experimental group
Segment B	**CONTROL GROUP (N = 419)**					**EXPERIMENTAL GROUP (N = 419)**					**DUE DATE PAYMENT TRENDS**
	SUPER EARLY PAYERS	EARLY PAYERS	DUE DATE PAYERS	LATE PAYERS	SUPER LATE PAYERS	SUPER EARLY PAYERS	EARLY PAYERS	DUE DATE PAYERS	LATE PAYERS	SUPER LATE PAYERS	
Month 1	5.97%	4.06%	30.79%	8.83%	50.36%	3.82%	1.91%	41.29%	8.11%	44.87%	11% increase in due date payment in experimental group
Month 2	6.68%	5.01%	36.52%	11.69%	40.10%	5.25%	5.73%	41.77%	12.17%	35.08%	5% increase in due date payment in experimental group
Month 3	11.46%	3.58%	36.28%	10.98%	37.71%	11.69%	4.53%	41.29%	7.88%	34.61%	5% increase in due date payment in experimental group
Segment C	**CONTROL GROUP (N = 4984)**					**EXPERIMENTAL GROUP (N = 4984)**					**DUE DATE PAYMENT TRENDS**
	SUPER EARLY PAYERS	EARLY PAYERS	DUE DATE PAYERS	LATE PAYERS	SUPER LATE PAYERS	SUPER EARLY PAYERS	EARLY PAYERS	DUE DATE PAYERS	LATE PAYERS	SUPER LATE PAYERS	
Month 1	0.50%	7.60%	18.90%	56.92%	16.07%	1.38%	8.71%	19.26%	56.18%	14.47%	<1% increase in due date payment in experimental group
Month 2	6.24%	6.10%	23.33%	39.23%	25.10%	4.35%	7.72%	23.80%	40.33%	23.80%	<1% increase in due date payment in experimental group
Month 3	5.64%	9.93%	25.56%	58.87%	0.00%	5.16%	11.96%	24.40%	58.49%	0.00%	1% decrease in due date payment in experimental group

LEGEND

- **SUPER EARLY PAYERS** : Customers who paid 6 or more days before the due date (newly designed messages do not intend to nudge these customers)
- **EARLY PAYERS** : Customers who paid 5 or less days before the due date
- **DUE DATE PAYERS** : Customers who paid on the due date
- **LATE PAYERS** : Customers who paid within 9 days after the due date
- **SUPER LATE PAYERS** : Customers who paid after 9 days from the due date (the study refers to these customers as wilful defaulters, those who default intentionally not because of lack of information or simple forgetfulness. The newly designed messages do not intend to nudge these customers)

Table 2: Pilot results for Segments A, B & C.

group in month 1 (29% vs 27%, X^2 [1, N = 9968] = 6.78, p = .009). However, no significant differences were found between the experimental group and the control group across month 2 (36% vs 36%, X^2 [1, N = 9968] = 0.04, p = .83) and month 3 (42% vs 41%, X^2 [1, N = 9968] = 0.14, p = 0.69). Hence, the results do not support hypothesis 1.The journey points selected for new messages were D-5, D-3, D-1 day(s) before the due date (D) and D+4, D+8 days after the due date (D) (highlighted by blue circles in Figure 8). Greater numbers of customers were expected to pay on the day the messages were sent and on the following day. Such a trend was observed across all three months between D-1 and D in segments A

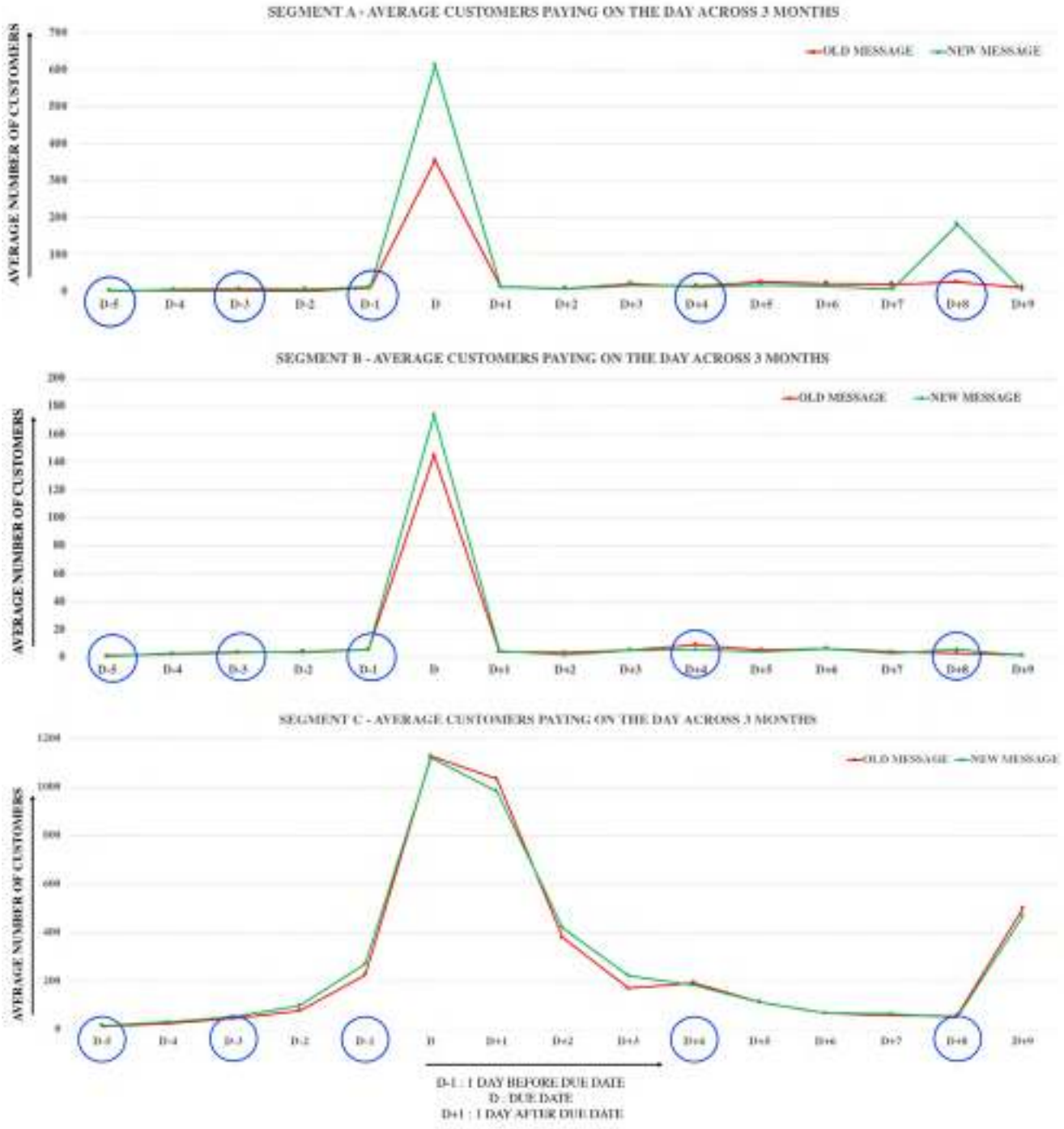


Figure 8: Segments A, B & C – trends in customer payment behaviour.

& B. On average, an overall decrease of 2 days was observed in the delinquency of customers in the experimental group, compared to the control group for segment A.

The pilot for segment A customers demonstrates that leveraging the levers of design – awareness, accessibility and education – in communication strategy can influence customer behaviour. It also reveals that using nudge-based messages significantly increased timely repayment and reduced delinquency on average by 2 days a month.

Consequently, according to the findings of this study, not all customers default on their payments on purpose. A large number of them seem to pay late for a variety of reasons, including a lack of attention to payment schedules, a lack of understanding about the implications of late or non-payment and a lack of clarification about the payment process, among others. Supposedly irrelevant and subtle elements such as the use of simple language, emphasis on critical information, the elimination of unnecessary clutter and sharing easy-to-access action links can be used to overcome such barriers. These simplification strategies make it easier to interpret information, by focusing attention on the most critical aspects of a message and thereby reducing the likelihood of misunderstanding and procrastination (Service et al., 2014).

These trends calibrate with other studies, in which the net difference created by the use of nudge-based messaging was between 6% and 21%. Ximena Cadena and Antoinette Schoar (2011) tested the effectiveness of incentives versus reminder SMS for loan repayment for a micro lender in Uganda. Their messages improved timely repayment by 7% - 9% relative to the control group, an effect size similar to the effect of reducing the cost of the loan by 25% for customers who repaid in full. They also found that the average days of delinquency dropped by 2 days a month. Similarly, Karlan et al. (2016) showed that reminder messages to save increased total bank savings and savings goal attainment by 6%, and Medina (2020) demonstrated how reminders for upcoming credit card payments reduced late-payment fees by 14% for a financial management platform in Brazil. Although in a different context, a study by Fishbane et al. (2020) also used text message reminders and redesigned summons forms to reduce the failure to appear in court for low-level offenses by 13% - 21%.

The results for segment B customers were directionally similar to segment A, although differences between the experimental and control groups were marginal and insignificant. It was observed that customers (segment A) who had previously experienced the consequences of default, such as a decline in their credit score (and thus creditworthiness) or nagging collection calls from lenders, responded more favourably to nudge-based messages than those (segment B) who had never experienced the consequences of default.

For segment C, the desired shift in customer behaviour cannot be attributed to the nudge-based messages. Both the control and the experimental groups had nearly equal numbers of customers who paid on time. Customers in segment C, like those in segment A, had defaulted in the past and had experienced the consequences of doing so. However, the presence of a systematic penalty (in this case, the retailer locking the purchased smartphones if payment was delayed) overshadowed the SMS nudges and pushed customers in both groups to pay on time. This had an impact on the results, particularly because the messages never mentioned the possibility of smartphones being locked.

With respect to repayment behaviour, it remains to be explored to what degree the messages' effectiveness diminishes in the presence of a stronger vehicle of influence, such as a penalty or an incentive, especially at a time when coercive debt collection techniques are pushing consumers into debt traps and escalating the need for ethical introspection. Meanwhile, research on pro-environmental behaviour suggests that although penalties can deter behaviours in some instances, they can lead to negative affect and defensive responses if deemed unreasonable (Bolderdijk et al., 2012). Thus, it is often desirable to turn instead to positive behaviour change strategies (White et al., 2019).

Hypothesis 2 – The new SMS series will nudge customers in the experimental group to use the self-service digital channel, compared to customers in the control group.

To test hypothesis 2 in segment D, a chi-square test of independence was performed in both the groups to examine the relationship between digital adoption and the messages.

It is important to note that the scope of the study was to promote digital channels among customers who would otherwise call the service centre for queries. The study did not intend to increase engagement with customers not reaching out to DMI Finance via either channel.

Segment D

Overall, 300 (7%) more customers used digital channels in the experimental group than in the control group. Significantly more customers reached out via the digital channels in the experimental group, compared to the control group, in month 1 (14% vs 6%, X^2 [1, N = 4192] = 76.20, $p < .001$), month 2 (11% vs 5%, X^2 [1, N = 4192] = 54.73, $p < .001$) and month 3 (10% vs 4%, X^2 [1, N = 4192]

Segment D	CONTROL GROUP (N = 2092)				EXPERIMENTAL GROUP (N = 2100)				TRENDS IN USING SELF SERVICE DIGITAL CHANNELS
	ONLY CONTACTED DIGITAL CHANNELS	ONLY CONTACTED CUSTOMER SERVICE CENTRE	CONTACTED BOTH	CONTACTED NONE	ONLY CONTACTED DIGITAL CHANNELS	ONLY CONTACTED CUSTOMER SERVICE CENTRE	CONTACTED BOTH	CONTACTED NONE	
Month 1	5.59%	8.08%	1.48%	84.85%	13.52%	6.43%	3.95%	76.10%	8% increase in use of digital channels
Month 2	5.16%	5.40%	1.34%	88.10%	11.48%	4.90%	2.00%	81.62%	6% increase in use of digital channels
Month 3	3.92%	0.48%	0.05%	95.55%	9.71%	0.29%	0.10%	89.90%	6% increase in use of digital channels

Table 3: Pilot results for Segment D.

= 55.72, $p < .001$). Hence, the results support hypothesis 2.When information was simple to understand, consistent across media and digital channels were extensively promoted via social media, more customers chose to use them for self-service. Also, over a four-month period, a reduction of 8% in queries, such as how to make a payment, requests for NOC and welcome letters, was observed following the refinement of communication across digital platforms. Additionally, call volume pertaining to payment status updates reduced by 5% in the same period. This supports the underlying assumption that customers were not using the digital portals because they were unaware of their existence and had limited access to them.

The findings of this study, in general, point to the benefits of incorporating behavioural science insights into customer communication. Such interventions have a direct impact on both collection and service costs. The key is to understand the psychological barriers to targeting behaviour and to use specific attention-grabbing and persuasive strategies to overcome them. Additionally, the study explores the opportunity to expand financial literacy among an under-served population, especially since message content can be easily ported to other technologies.

Conclusion

As Daniel Kahneman famously said, '*moving forward in behavioural change should be a mix of applying insights from literature and learning from application*'. This research raises new concerns that should be investigated further in the future.

The study was affected by uncontrollable external factors. The socio-economic fallout of the COVID-19 crisis heightened, thereby affecting customers' ability to repay. As a result, the Reserve Bank of India introduced a moratorium on loans when the pilots were first launched, resulting in higher cases of payment delays and defaults that would not yield any penalty fees from customers.

The study also experienced technical constraints from the external and internal environment. With changes in the Telecom Regularity Authority of India's regulations, message content had to be frequently adapted to meet new criteria. Also, reminder messages could only be sent at predetermined intervals, because the technical system required minimum three days to provide a payment status update. This implied that if the system failed to update records on time, many customers who may have paid would still receive messages regarding non-repayment, thereby pushing them to call the service centre. The extent to which these factors influenced the efficacy of the messages is yet to be determined.

Further, since a nudge in itself creates a subtle change in context that could trigger a small incremental change in outcome, the study resorted to the use of multiple nudges in a message series spread across a period of three months. This limited the study's capacity to pinpoint which nudge was the most effective. Nonetheless, it is important for future studies to measure isolated effects of single nudges, as small nudges may have large effects.

Moreover, because the intervention aimed at creating a long-term change in a recurring behaviour, it is likely that habituation will have an impact on the effectiveness of the messages. As such, SMS content may need to be redesigned after 12 months or four cycles of use, to continue to produce similar results.

The future of this research presents substantial possibilities. Once a correlation between personas and payment behaviour is determined, DMI Finance will be able to distinguish occasional late payers from deliberate late payers, thereby effectively deploying both traditional and non-coercive tools, such as nudges, to drive desirable behaviour. The use of WhatsApp for business communication would expand this research to include over 100,000 customers, thereby presenting an opportunity to positively influence their repayment behaviour and subsequently increase collection rates.

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Behavioural Economics Is Booming in Banking: Should You Join In?

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Financial regulators around the world have turned to behavioural science to identify, contain and predict human sources of risk in financial supply chains. The most scientifically literate regulators have introduced "culture assessment" tools, designing their own behavioural experiments and observational fieldwork and commissioning independent research. Lingering public suspicion of the financial sector after the 2008 financial crash bailouts and continuing events of misconduct in the decade since, besides the social stresses of the pandemic, have led financial firms to reflect on "socially purposeful culture". Responding to these challenges, firms are adopting a "behavioural lens" approach, recruiting in-house specialists in social psychology, behavioural economics and predictive analytics. As a result, for behavioural science graduates, there has never been a better time to consider a career in the financial sector.

Introduction

Have you ever stopped to wonder which industry is showing the fastest increase in rates of recruiting behavioural scientists, right now? Though you might guess (reasonably enough) that it's user experience specialists in tech businesses, one of the sharpest rises in new roles for applied behavioural insights is in fact in financial services. A new "behavioural track" is opening up in our sector, and we would like to highlight this opportunity, in case you'd never considered putting your skills to work in the finance industry.

During the past decade, financial regulators in the UK and internationally have bought into behavioural science big-time, looking to the science to solve longstanding problems of persistent abuses of customers (and others) in this notoriously competitive – and historically troubled – field. The good news for behavioural scientists is now that the new so-called "conduct approach" to financial regulation (conduct = behaviour, right?) is established to a point where banks are now themselves hiring behavioural specialists to pre-empt the attentions of a conduct regulator. Let's consider the landscape, to see why.

Early Behavioural Investigations by the Regulator

For its first few years of existence (2013-19), the regulator that protects UK financial customers, the Financial Conduct Authority (FCA), ran a series of behavioural experiments in consumer protection. It investigated first: how are financial providers' sales activities exploiting consumers' biases – present bias, overconfidence, reference-dependence and so on? Way back in 2013, the FCA published a pathfinder guide (FCA, 2013) identifying a "Top 10" of behavioural biases that interfere with good practices in retailing financial products. Such as:

- present bias induces consumers to overspend on their credit cards, as they chase immediate gratification
- overconfidence is widely found in consumers' (and indeed professionals') excessive belief in their own skill at 'picking a "winning stock"'
- halo effect leads many customers to follow any financial advice given, 'because the adviser is likeable'.

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Next, the regulator recruited an in-house behavioural research team, who then started to question whether financial firms were (knowingly or otherwise) exploiting patterns of behavioural weakness among customers, such as:

- Why do customers run up expensive overdrafts, when they could easily avoid this by making a pre-emptive call to their bank?
- Why do credit card customers, who could afford to do so, not bother to pay off their card balances sooner?
- Why do so many people save so little for their retirement?

The regulator has continued to debrief and publish a range of resources urging banks and firms to pursue their own behavioural experiments and to act on the outcomes from these investigations[1], hence the nascent boom in financial firms hiring behavioural skills in-house: partly to 'keep ahead of the regulator', as new types of regulatory investigation are rolled out (Miles, 2021), and partly because they are rediscovering how far applied behavioural insights bring all kinds of benefits to product marketing.

The New Focus: 'Culture Assessment', Coming to a Bank Near You

From 2022, aligning with momentum among financial regulators internationally (DNB, 2015; MAS, 2020; APRA, 2021), the FCA will be pursuing a grander ambition: to observe and assess "human risk" across entire firms. This initiative (FCA, 2020; FCA-Steward, 2021) will see regulators deploying a range of new tools to assess behaviour. These tools and related indicators will evaluate factors such as leadership integrity, active open-mindedness, psychological safety (including 'speak-up' and 'anti-bystanding'), cognitive diversity, bias-awareness and reflexivity (Edmondson, 2019; Ewing et al., 2020; FCA-Rathi, 2021; Foss, 2020; Nabeel & Miles, 2021). From next year, they are about to start applying behavioural principles to measure how financial firms' staff interact in the workplace and how far they are really serving their customers' best interests.

As one result of all this: if you're a new behavioural science graduate, it is a great time to pursue a career in finance as firms scramble to get ready for this new "culture assessment regime." You might also be tempted by the notion of applying your hard-won B/Sci skills to make the world a better place, by cultivating corporate social consciences in a field previously seen as somewhat barren of these ethics.

The new breed of behavioural science-powered financial regulator is flourishing – more than 50 such agencies around the world describe themselves as 'applying behavioural insights' to develop market rules (IOSCO, 2017). They also espouse empirical testing of 'what actually happens' and are suitably sceptical of financial brands' lofty claims to "positive social values". Several regulators' inspectors make direct in-workplace behavioural observations ("floor-walk tests") and sponsor primary research, looking at the banking system from outside-in to avoid data bias arising from in-group sources they would have previously relied on (the discredited 'self-assessments') (Miles, 2021). Perhaps best of all, regulators see the new science as fully aligned with their own mission to support economic integrity and financial stability, whilst "retrieving" post-pandemic public trust in financial firms (FCA-Woolard, 2020).

Though the initial change in thinking was political, it is now all about the science. As a simple example of regulators' applied behavioural thinking, a regulator's inspector will now challenge financial firms' employees to describe how they frame or "mentally account" for what their financial firm is doing, for the public good – and for how long they've ever paused to think about this point. Back in the day – before the 2008 global financial crash and/or before the pandemic, whatever your preferred set-point – people tended to perceive banks as an obscure but somehow necessary presence in our lives.

[1] Our good friend and colleague Alexandra Chesterfield, former lead behavioural researcher at the FCA, gives an excellent summary account of these experiments and their findings on UCL's behavioural insights web strand, *Changing Minds* (UCL, 2020)

Since then, the system has faced societal upheavals in the form of "stakeholder capitalism" emergent after the 2008 crash, and "social equity" questions during the pandemic. There have been competitive jolts, too, with the arrivals of "challenger banks", cryptocurrency, service bots and disintermediated (peer-to-peer) customers.

All of these factors stack on top of a long-term rumbling public disillusionment with a financial sector that is widely perceived as a habit-bound, opaque, anti-competitive, introspective boys' club that's possibly past its use-by date. Hence, people might welcome a chance to reframe their mental picture of banking, for it to be something, well, less like what we think of as "banking" and more like any other utility – the water supply, say, or the power company, or the Wi-Fi. Just as you flick a switch and expect the light to come on, so you now expect to switch on the bank (app) and get a line of credit.

From 'Dark Side' to Bright Side

Initially, conduct regulators used behavioural analytics to help chase the bad guys and identify financial misconduct – essentially, selling people the wrong stuff, or selling stuff to the wrong people, or both. Then, regulators moved the focus beyond narrow prosecutions for mis-selling, to start looking harder at "non-financial misconduct". This followed recognition, informed by behavioural science, that all kinds of misconduct can present a valuable cultural "tell" to the regulator's inspector. As one of our research respondents pithily defined it, in a workplace where "behaving like a jerk to people you work with" is normal, that behaviour is itself a reliable proxy indicator that the firm tolerates generally unhealthy attitudes towards customer care and ethics. Firms' historic tolerance for cultures of abusive behaviour, for as long as badly behaved individuals were selling lots of product, is after all a staple of popular culture; we know it when we see it[2] .

A second pivot-point for regulators has been recognising a phenomenon that B/Sci types noted ages ago: the proportionate linkage between social proof that 'legitimizes wrongdoing', and the severity of events of misconduct (Vaughan, 1999). People break rules more easily when their mates at work do so as well; the teams we work in, and feel part of, have a huge impact on whether we tend to do the right thing (Scholten, 2018), hence the impetus for two new workstreams among conduct regulators: "culture assessment" and "detecting non-financial misconduct".

Our industry's rule-makers – and a few of its business leaders – have also meanwhile seen in the advent of Covid-19 not only a public health hazard, but also a second shot at redemption for the financial sector (FCA-Woolard, 2020). Following the 2008 crash, as the public saw it, banks had simply helped themselves to a big chunk of taxpayers' money, run away with it and used it to rebuild their shattered balance sheets. As a result – in the UK at least – they had been seen to cause ten years of hated austerity, generating a wave of vox populi risk (Fordham, 2016) that has fuelled mass public protests and electoral shocks. A pandemic, by contrast, might present an unpopular sector with an opportunity to shine. In its own way, Covid added momentum to an existing regulatory push for 'socially useful' banking (Carney, 2014): how might firms use behavioural analytics to show us delivering on a "fair social contract", so making the world a better place? Which analytics proving what outcomes?

Even before the pandemic struck in spring 2020, several countries' regulatory agencies had already back-flipped their conduct policy (and rhetoric) from "punishing misconduct" towards "promoting exemplary conduct". Now that Covid has perversely handed us a socially aware reset, we might well ask: have banks stepped up to the opportunity to serve the public good, and to "highlight the bright side" of their work? How's that "behaviour assessment" work going; is it proving you've changed for the better?

Now, all you B/Sci types will probably be meta-analysing that development: is this a policy shift or simply a reframe, a bit of regulatory theatre manipulating the labels? Is it a sly attempt at instru-

[2] One need look no further than Hollywood: *Wall Street, The Wolf of Wall Street, Rogue Trader, The Boiler Room, Glengarry Glen Ross, The Big Short, Margin Call...* need we go on?

mental conditioning, at building new muscle memories for good behaviour by displacing bad habits in favour of "pro-social patterns"? Is it a long overdue acceptance of the failings of classical punishment theory, by endorsing the power of intrinsic motivation and recognising the universal human longing to sustain a positive self-image? Maybe just a classic action-bias-driven watchdog intervention? Or availability bias, using new analytic tools "because they're there"? All of the above? Or something else?

If we next set out some highlights of the regulators' "new behavioural agenda" for financial firms for the 2020s, you can make up your own mind how far these present engaging opportunities for BE-ists.

The Mission: Can We Please not Repeat Previous Crises?

As you will know, much B/Sci research addresses this question, albeit meta-analyses (such as Reinhart & Rogoff, 2011; FICC, 2018) offer few reassurances or practical remedies. It seems that, ironically enough, the lesson of history for financial markets (and humanity in general) is that we're really bad at internalising any lessons from history. Whilst regulatory design has the noble aims of trying to keep markets working smoothly, and to stop firms ripping off customers, it always faces an epistemic problem, in that it serially addresses the previous crisis, never the next one.

We may therefore predict with confidence – tragically – that between today's publication of the 2021 BE Guide and its next edition in 2022, there will be at least another three major banking scandals, since that's the observed rate of event risk for such things happening, over many years. (Just consider the current business year 2020-21: Wirecard, Wells Fargo [part 2], Greensill Capital; not even thinking about many lesser, near-miss events.) Every regulator in our field wants to prevent the next banking scandal – has always wanted to – but we have to expect that they will continue to fail in this endeavour.

Yet we do now know that banking scandals are the outcome of poor cultures and behaviours. The new regulators call this insight 'behaviour-at-risk' and are working on identifying the drivers of these factors, using B/Sci experimental designs and developing AI-assisted predictive tools.

So, surely, this time really is different? Don't hold your breath. It is, however, just possible that the rollout of the new tools for culture assessment will break the established trend, which is why we here call on our BE colleagues to support them. Time, then, to look at some components of the new behavioural lens approach that's going to apply.

Putting Your BE Skills to Good Use to Make Banks Work Better

Around the world, from Australia and Singapore to the UK, the Netherlands and Ireland, and onwards to the USA and Canada, financial conduct regulators voice a common message: to prevent new scandals, we need to assess firms' culture (Miles, 2021). Preventing scandals is an important way to build trust in banking – as a foundation for financial stability and the economic integrity of nations. Who can disagree with that?

Regulators host regular conferences on culture and behavioural analytics, gathering together bankers and encouraging them to engage. As a few regulators have been doing (such as the Dutch, Australian and Canadian regulators), many more are now taking the next step of actually going into financial service firms to run face-to-face culture assessments. Around the world, banks are responding by investing in their own behavioural risk and culture assessment capabilities. Behavioural risk teams are popping up, staffed with entrepreneurial behavioural scientists who apply insights to corporate practice, in order to prevent future issues (Wood, 2021). As a matter of public record, major brands, including HSBC, Standard Chartered, ING, ABN AMRO and NatWest/RBS, have all recruited behavioural research leaders from academia and/or regulatory agencies.

The impulse for this article, in fact, was conversations these authors have had with professional friends who are pioneering the application of B/Sci to financial market practice in those brands and elsewhere. Just as there are various different ways for regulators and banks to go about this task, so there are different points where a canny BE practi-

tioner within a financial firm may choose to plug in their own personal skillset.

One such point involves applying behavioural insights to the way a firm makes new products for customers (just as BE is already doing in many other consumer product fields, in fact). Too many financial products in the past – unintentionally or not – tempted customers to spend more money than they could afford in the long run. Thanks to misbehaviour by some brands, our industry has left an infamous trail of exploitation of customer biases such as short-termism, reference-dependence and availability. As we've just seen above, behavioural specialists are now working in many banks to redress the balance towards the customer's good, to help prevent mis-selling and improve product design by the better framing of purchase decisions.

Now, if a bank thinks of, say, a new type of mortgage or savings app, the people involved in creating it will need to test that the product is genuinely helpful to customers and won't harm anyone. As with any new product development, behavioural science can help uncover pitfalls and unexpected consequences, to reveal weaknesses in product or process. BE can model and predict how the customer might buy the new product; is it friction-free and yet also designed to ensure that the customer makes a sound, rationally informed choice?

As you might also know – if you have followed news events such as the Panama Papers or the FinCen Files leak – criminals try (and sometimes succeed) to use banks to "launder" their illegal earnings. To prevent this from happening, the knack is to detect a crook in time; to identify patterns of behaviour that reveal a criminal who's disguised as a "legitimate" new client, or who may have slipped into the bank's existing client system undetected some time ago. Increasingly, behavioural analytics are used to prevent financial crime and detect vulnerabilities. As a simple example, even well-intended bank managers are prone to halo bias, believing that there could not possibly be any crooks amongst their clients: 'I've known all of them for years, there is no way even one of them is dishonest!'.

Finally regulators, and banks themselves, are now using behaviour-based culture assessments to forestall future problems. Searching various behavioural data, they will find potentially corrupting team cultures and intervene to fix these before bad behaviour becomes a systemic norm. It is rarely the case that misconduct (bad behaviour) is down to a single 'bad apple' (Scholten & Ellemers, 2016), since misbehaviour has often grown within a team or subculture that encourages – sometimes unintentionally – people to bend the rules. Social proof ("everybody does it") is of course a strong fuel for misconduct in close-working teams – as are unfair treatment by a line manager, skewed incentives (cash bonuses for "hit-and-run" selling) and "stretch target" pressures to recoup revenue lost during the pandemic.

In fact, we may sort these behavioural drivers into *organisational drivers* (such as strategy, steering, incentives, codes), *social drivers* (moral climates, psychological safety, shared beliefs), *individual drivers* (cognitive biases, motivation) and *contextual drivers* (such as market conditions, the pandemic, Brexit) (DNB, 2015). Behavioural science, of course, illuminates how these factors may lead to rule-breaking behaviour.

B/Sci shows us where to look for the "tells" that identify the early stages of misconduct and intervene with targeted actions to deter misbehaviour. Behavioural or cultural risk assessments often combine quantitative and qualitative research methods. By all means keep on doing surveys, but combine them with confidential informal conversations with employees, depth interviews and observations of daily work situations. The analysis is strongly based on the type of scientific research methods (coding, grounded theory, statistical analysis) that make any behavioural scientist feel right at home.

Looking to the Future: Even More Opportunities for BE-ists

We see opportunities for BE practitioners only expanding, as our industry gathers pace with these reforms. On both sides – regulators and firms – there is an exploding demand for designing and interpreting cultural assessments; we've just published well-received research on this very point (Miles, 2021). Let's leave you with three example work opportunities to consider:

1. Regulators all around the world are joining in the hunt for new assessment tools with greater capability to detect social drivers of (good and bad) culture and behaviour. If your research work has produced any new model insights, such as previously undiscovered cause-effect linkages, pitch away.

2. Any analytic tools that help shorten the distance and/or time lag between an event of misbehaviour and the early detection of that event will be eagerly welcomed. Such tools include improved observation technologies (yes, we mean surveillance – which is, of course, controversial for many) and pattern-recognition tools (such as AI, massive parallel processing and social network analytics). Behavioural science may help to catch misbehaviour at an early stage, stopping the slippery slope by which an initial innocent mistake can morph into serial unethical actions. Predictive analytic tools are increasingly drawing on behavioural experimental design to improve the accuracy of their forecasts of bad behaviour, to prevent "norms of misconduct" from gaining traction.

3. Finally, there is plenty of work to do to pull some of BE's mighty theories into the practical application space that our financial brands are now so keen to expand. We know of banks who would be interested in talking to anyone who has managed to develop robustly empirical and universal indicators for human risk factors such as bystanding, psychological safety, cognitive diversity, situational awareness, vox populi risk, hysteresis and motivated reasoning. Though we have been following the experimental literature on all of these elements – thanks Alain – as yet we have seen only a limited number of reliable prototype scorecards. Who's up for this challenge?

As practitioners, we are constantly reminded what a privilege it is to be working in this field at such a formative time. The science has shown this somewhat late-arriving sector the value of deploying behavioural insights to intervene in and improve financial firms' recognition of their wider value to society. Further ahead lies a promised land of predictive behavioural indicators for all of the above – and more. But before we dive into that pool and go all *Minority Report* on you... wait until next year's BE Guide.

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Tired of Behavioral Economics? How to Prevent the Hype Around Behavioral Economics From Turning Into Disillusionment

*Florian Bauer and Manuel Wätjen**

Vocatus

Applying the behavioral economics effects found in academic experiments to marketing is becoming more and more popular. However, there is increasing evidence that copy-and-pasting academic effects does not achieve the desired effects in real life. This article aims to show that this is not because customers are becoming wise to nudges or that behavioral economics does not work at all, but because the application of behavioral economics typically ignores the contextual aspects of the actual decision to be influenced. Herein, we present a framework that considers these aspects and helps develop more effective behavioral interventions in marketing, pricing, and sales.

Situation: Doubts and Disillusionment Replace Initial Enthusiasm

Over the past few decades, behavioral economics has not only revolutionized economic thinking, but it has also significantly changed business management. The focus on the decision-making process of customers and the associated greater attention to touchpoints in the customer journey make behavioral economics a great source of ideas on how to influence decision-making behavior systematically. Ultimately, there is additional potential for increasing conversion and margins behind every effect of predictable irrationality. It seems as if the only thing to do is to transfer individual effects from the academic literature to practice, in order to increase company results significantly.

As great as the enthusiasm was—and still is—for taking up and implementing the findings of behavioral economics in marketing, pricing, and sales, doubts are growing that a simple transfer of academic effects into practice does not always work (Smets, 2018):

- **In B2C:** Obtrusiveness and the extent to which the effects are used (S-M-L portfolios on every corner; artificial scarcity ("Only 3 rooms left!") are not only implausible, but they have also become annoying to many customers. Effects that are so crudely implemented in practice cause customers to lose trust in providers (Shaw, 2019).
- **In B2B:** Here is where the transferability of the behavioral economics effects has always been questioned more strongly, based on the assumption that professional decision-makers should act much more rationally than private customers when making complex decisions.

This can give the impression that the findings of behavioral economics are a dying form of hype (B2C) or that they are not even worth trying in the first place (B2B).

This skepticism is well-founded. However, this is not because behavioral economics does not work generally (B2B) or any more (B2C) but because we tend to make it too easy for ourselves when it comes to practical application: We may spot a funny effect in a book or even a scientific article and then try to apply it to our own marketing (Piper, 2020). This can be done swiftly, especially in e-commerce, where traffic is often high, and A/B tests are quickly implemented. Sometimes, this direct transfer

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works and is rewarded with higher conversion rates, sometimes nothing happens at all, and sometimes it backfires and results in fewer sales than before.

Why do the effects work sometimes, but sometimes they do not do so? Is it really because the behavioral economics insights are not—or no longer—valid, as customers have become accustomed to them, or is it because they have never been valid?

As we shall show in this paper, there are two answers to this question: The nature of academic empirical behavioral economics, based on which the widely cited effects were found, and the typical approach of transferring scientific findings into practice. We shall show that the combination of experience background, situation, and heuristics (condensed in a typology of decision-making strategies) helps resolve the issues of transferring academic insights into practice.

Background: The Goal of Empirical Behavioral Economics

Academic behavioral economics is not primarily about helping practitioners find new marketing tricks. Instead, it was—and continues to be—directed towards a very simple goal: It wants to refute the model of rational decision-making that underlies neoclassical economic theory.

Academic research focusses on model falsification and has an entirely different goal to practical application. It is about disproving that people always decide rationally and always maximize their utility. It is about showing that people are not always perfectly informed or always have stable and intransitive preferences. This makes behavioral economics essentially a 'negative' endeavor that repeatedly shows us how people are *not* making decisions. Yet, the effects, based on which this is shown, neither embody the actual scientific message nor claim generality through their selective proof. They are only a means to an end. This procedure is entirely legitimate, albeit from a strictly academic point of view.

Experimental results—very many of them—do not show us what things are but at best what they are not. Take Popper's famous black swan, for example (Popper, 1963): Even if you see only white swans your entire life, that does not mean you should claim that all swans are white. But if you see a black swan, you can certainly say that not all swans are white. In the best case, this means that what we learn with every empirical observation or experiment is which model of the world is wrong, but never which is right. The purpose of experiments is not to develop a theory but to falsify it. Experimental results can be—at most—inspirations for developing a theory, but they can never replace it.

In this respect, behavioral economics has impressively succeeded in showing that people do not decide rationally. However, what behavioral economics has not yet achieved is to contrast the model of rational decision-making with an alternative model that can explain all the experimental findings with as few assumptions as possible ('Ockham's Razor'). Only such a model would allow marketing practitioners to plan interventions, which, provided the theory is valid, we could expect to have an effect in the intended sense (e.g., to influence people's decisions in a particular direction).

The Conceptual Consequence: 'Homo Heuristicus' as a New Paradigm

In the absence of an alternative empirically-based model of human decision-making behavior, popular science and practitioners have quickly settled on 'Homo Heuristicus' (alias 'Homer Simpson'; Gigerenzer & Brighton, 2009) as a counter-model to 'Homo Economicus' (alias 'Mr. Spock') or 'Econ' (Thaler, 2005). This model is bold and intuitive.

However, this model is negative in the sense that it is not only designed to falsify 'Homo Economicus', but also that it primarily points out the inadequacies of the human perception and decision-making apparatus (take the terms 'biases' or 'misbehaving' as an example; see Tversky & Kahneman, 1974, and Thaler, 2005, respectively). While this model is very easy to understand, it also complicates the acceptance of behavioral economics: The fact that customers are biased and can misbehave may make us smirk, but it is hard to convey, especially when we talk about business customers and professional purchasers.

The Practical Consequence: Nudging as an Imperative, and Copy-and-Paste as a Method

Scientific behavioral economics experiments are not—and were never intended to be—a positivist guide to practice. However, in the absence of a practical theory to apply behavioral economics to real-life problems, the nudging hype has elevated precisely this positivism religiously (even though this may not have been the intention of the original authors). Now, the key insight of behavioral economics is no longer seen in the refutation of the rational decision-making model or other basic assumptions of neoclassical economic theories. It is rather seen in the selective result in itself, which is transferred to practice with the expectation that the experimentally elaborated effects found under laboratory conditions will also show up in practice.

The fact that many of the published effects are contradictory to each other (because they suggest conflicting recommendations for practice) makes clear that this is the wrong approach. Take the question of how many options to offer a customer to convince him to buy: Only one option to avoid the 'paradox of choice'? Two options in order to use one as an 'anchor'? Three options for the 'Goldilocks' effect? Behavioral economics has no answer to this question, as this was not the aim of the research efforts. Each of these effects in itself contradicts one or more basic assumptions of rational choice theory and thus has an epistemic value from an academic point of view—but it has no specific value from a practical point of view. This paradox leads to the following notion: The more effects we find, the more difficult it is to apply them, because the more likely it is that effects contradict each other.

This makes the fascination around nudging a double-edged sword: It is nice to get more ideas for implementation with every new scientific publication (and scientific journals explicitly ask for such suggestions), but we should not forget that this superficial derivation often harbors more risks than opportunities. The most considerable risk of all is that based on a superficial and ultimately unsuccessful transfer, the whole topic of behavioral economics is dismissed either as unhelpful or as hype that has become no longer useful.

Nudging via copy-and-paste is a lot of fun and suits the zeitgeist of corporate organization, thanks to its agile approach. However, that alone is not a guarantee of success. Successful interventions are based on valid models. This is where Einstein's famous quote holds true: "Nothing is more practical than a good theory." With this in mind, we set out in the following sections to find a consistent decision-making model that will enable and facilitate practitioners to apply the findings to practice.

From Academic Behavioral Economics to Practical Behavioral Marketing

From Biases to Heuristics

Let us start with the following question: Why do people actually make predictable mistakes in their decisions? Why don't we just learn to make the 'right' decisions?

Why we decide the way we do inevitably leads us to the bigger question of why we are the way we are. We are the way we are because the mechanisms of evolution have shaped us that way. Our entire constitution has simply proven to be sufficiently well adapted, given the environment in which we live. This is also what is meant by the famous and often misused phrase 'survival of the fittest'. Put simply, the traits that survive best and are more likely to be inherited are those that are best adapted to prevailing environmental conditions. This is not an active selection or development towards an 'ideal' goal but a passive selection. Thus, those characteristics that were a hindrance to survival and inheritance in the past simply ceased to exist.

For example, we do not perceive light, volume, and many other stimuli in absolute terms, such as a physical measuring instrument, but in relative terms: The brighter the light, the more additional light intensity it takes for us to notice a difference. While this is not optimal in the sense of 'objectivity,' it is extremely efficient, because it allows us to cope with a much wider range of brightness differences. This is why our ancestors could still perceive the saber-toothed tiger at dusk as well as in bright sunshine and run away in time. In this respect,

such biased brightness perception has evolved into a survival advantage and could be passed on to the next generation, as the tiger did not eat our ancestors. The contrast effect and the relativity effect of behavioral economics can be traced back to this perceptual heuristic.

Just as our bodies are not designed for any kind of optimum, our decision-making apparatus is not made for utility maximization; rather, it functions 'well enough' in most, but not perfectly in all, situations ('satisficing' instead of 'optimizing'; Simon, 1956). Decision-making rules that have proven to be 'good enough' in certain situations are stored as 'heuristics', which can be thought of as conscious or unconscious rules of thumb. They allow us to make decisions even with limited capacity, ability, time, and energy. The core message of behavioral economics is not that people always make irrational and error-prone decisions but that their cognitive capacities are always limited. Thus, people constantly apply heuristics, to be able to make decisions at all.

The use of heuristics has nothing to do with incompetency (which the terms 'biases' and 'misbehaving' suggest). It is rather a handy and efficient (and indeed the only possible) way of processing information and making decisions, and it has proven good enough in many situations. However, while the same decision-making rule may lead to a utility-maximizing outcome in one situation, it may lead to a predictable decision error in another. The 'irrationality' of a given heuristic, thus, is rooted in the fact that it has proven to be 'good enough' in many situations, but in others, on the contrary, it has turned out to be inadequate.

Let us look at the following example of the scoring heuristic as illustrated in Figure 1 (Bauer, 2000). In many cases, it is good enough to rate offers ac-

Figure 1: Preferences for telco plans.

cording to their individual attributes on a binary scale (better/worse) and sum up these individual judgments to form an overall judgment. However, in some situations, it leads to a systematic misjudgment:

Although both offers have equal (absolute) costs in both choice situations, the zero-sum shift of 270 DKK from device to installment costs for offer 2 in choice 2 means that offer 1 'wins' in two out of three price elements. Consequently, offer 1 is perceived cheaper in choice 2 and preferred in the experiment, even though effective costs are still the same.

From Heuristics to Decision-Making Strategies

To understand (and influence) how people make decisions, i.e., to apply behavioral economics in practice, we need to understand when they use which heuristics (situation and experience background), and how specific heuristics are activated (by the design of choice architecture).

Let us look at the much-cited Decoy Effect (Ariely & Wallsten, 1995).

In choice 1, as illustrated in Figure 2, by an obviously inferior option (print-only), people strongly prefer the bundle option of both e-paper and print. However, when removing the print-only option (that nobody wanted!), the decoy that makes the combination appear a good deal is missing, resulting in a shift of preferences to the cheaper e-paper-only option in choice B.

However, marketing practice can often not replicate this effect, because the situation is different. While one would make the same choice with regard to these offers in the experiment (preference), in an actual purchase situation getting two products of very different value for the same price might make people more skeptical and may keep them from buying (actual behavior).

		Preferences
Choice 1		
E-paper	USD 59	16%
Print	USD 125	0%
E-paper & print	USD 125	84%
Choice 2		
E-paper	USD 59	68%
E-paper & print	USD 125	32%

Figure 2: Decoy Effect.

Think of the 'Goldilocks' effect (De Ridder, 2008) for another example. Those who have had experiences with data throttling or high roaming costs in excessively cheap mobile plans, and being ripped off with overly expensive plans, will be more likely to opt for a mid-range plan in situations where there are several mobile plans from which to choose. Poor experiences thus make the use of heuristics that focus on minimizing risk more likely. In situations where uncertain customers perceive a high risk for wrong decisions, due to many decision options, highlighting mid-range plans (design of the choice architecture) can activate or reinforce the Goldilocks heuristic.

Although not all heuristics are applied in all situations, people use a rather systematic approach to making purchasing decisions. This is reflected in the fact that different heuristics combine to form holistic decision-making strategies (e.g., reducing uncertainty), that certain decision strategies are more likely in certain decision situations (e.g., purchasing a mobile phone plan compared to, for instance, grocery shopping), and that different sets of heuristics (e.g. Goldilocks, Bandwagon) are activated in such situations.

For practical purposes, this suggests segmenting customers according to their decision-making strategies, to predict which behavioral economics effects are best suited for which marketing task, and to avoid the mistakes of an overly simple copy-and-paste approach.

From Decision-Making Strategies to Decision-Making Typology

The GRIPS typology (Bauer & Wätjen, 2018) is one way to segment customers according to their decision-making processes, with a focus on the application of behavioral economics to marketing, pricing, and selling:

Three aspects show the validity and practical relevance of this decision-making typology:

- The GRIPS types (Figure 3) replace the negative 'Homo Heuristicus' model with a positive model of how people really decide.
- Using the GRIPS types has been shown to influence decision-making behavior: In many projects across different industries, we have demonstrated significant increases in conversion and margins through the type-specific application of behavioral economics effects:
  - Banking, branch office: Increasing the rate of scheduled consultation appointments by a factor of 3
  - Energy, mailing: Reducing churn rate by 31%
  - Insurance, branch office: Reducing average rebates by 44%
  - Print media, call center: Increasing conversion rates by 148%
  - Telco, call center: Increasing conversion

GRIPS type	Experience background	Exemplary situation	Typical heuristic
Bargain Hunter	You can always make a good deal	Negotiating the price for a new car	Hyperbolic discounting
Risk Avoider	There is a risk of being ripped off	Opting for a telco plan	Goldilocks effect
Price Accepter	The more you pay, the more you get	Buying a high-end smartphone	Anchoring effect
Routine Buyer	Comparing is not worth the effort	Grocery shopping	Halo effect
Indifferent Buyer	I will regret if I don't buy now	Refueling at the gas station	Effect of free

Figure 3: GRIPS typology.

- The GRIPS types do indeed react differently to behavioral economics effects (Figure 4), but differentiation by situation also resolves the contradictions that arise from the overly simple copy-and-paste approach.[1]

[1] For example, bargain hunting (or seeking to optimize the transaction utility of a purchase decision) is an inherently consistent decision strategy. We can predict that the 'decoy effect' works well for a Bargain Hunter because it changes the decision context to give the option an obvious high transactional utility. And that 'paradox of choice' has no negative effect for the Bargain Hunter, because multiple options do not complicate the decision for his decision-making strategy. This contrasts with the Risk Avoider, who does not want to maximize the advantages of a decision but does wish to minimize its disadvantages. The 'decoy effect' makes him less decisive because he is more skeptical, and the 'paradox of choice' affects him because the numbers of possible wrong decisions increase.

rates by 35%

From B2C to B2B

Let us return to our second initial question: Are professional decision-makers more rational than private customers are? Do the findings of behavioral economics apply here at all?

The answer is yes, because:

- First, heuristics have evolved and are hardwired into our perceptual apparatus. An example in this regard is the contrast effect, according to which we perceive differences (e.g., light/dark) stronger than they actually are. Given two different prices, the fact that the smaller one is perceived to be lower than it actually is, and the larger one is perceived to be higher, is a perception that even business customers cannot defy.
- Second, B2B is sometimes formally involved in more important decisions with more expensive consequences. Nonetheless, B2B decision-makers are rarely personally liable, and therefore they often do not have the same aspiration to make the 'right' decision compared to private consumption choices. And when they do, the 'right' decision is not necessarily the rational one but the one that the decision-maker can best represent and sell internally.
- Third, the decision-making structure often creates misaligned incentives and structural irrationalities. Incentivizing buyers with negotiated discounts, for example, does not necessarily lead to the optimal long-term, cost-effective purchasing decision but to the decision in favor of the supplier that gives the largest discount.

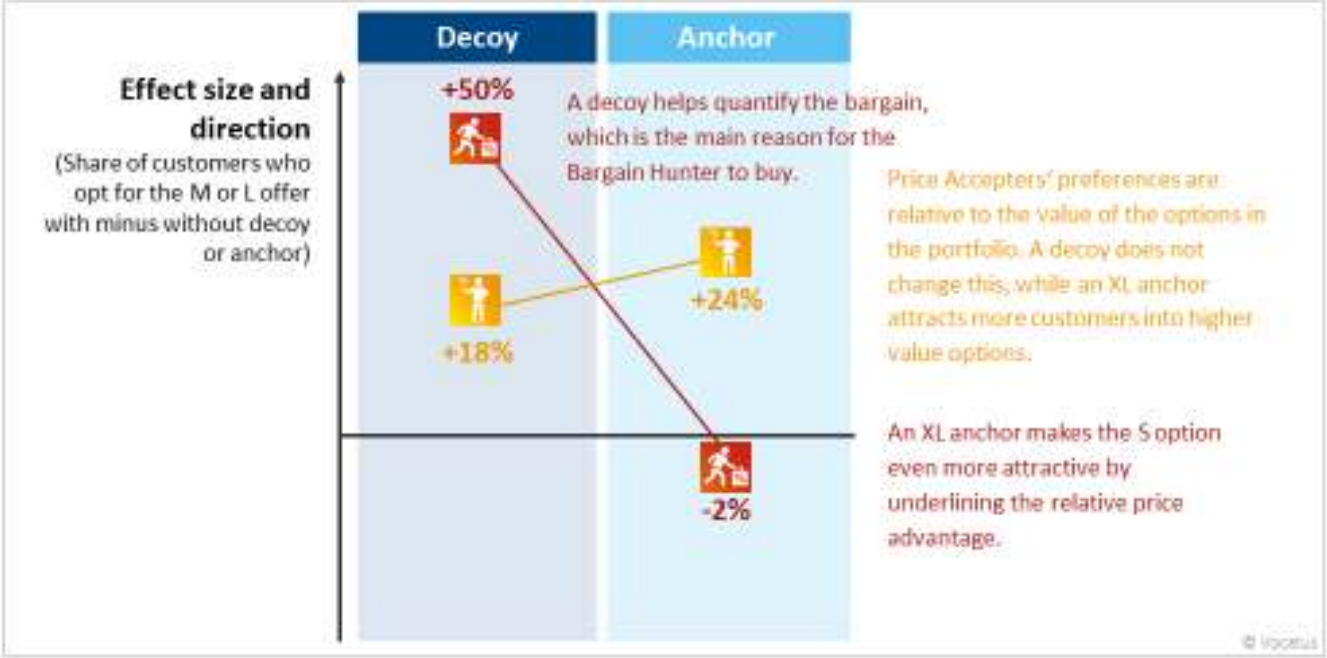

Figure 4: Reaction of the GRIPS types to behavioral economics effects.

If we abandon the negative model of 'Homo Heuristicus', alias 'Homer Simpson', and use a positive model instead, for example the GRIPS typology, the acceptance of the validity of behavioral economics in the B2B sector will be much higher.

Summary and Implications

As we have shown, the unreflective collection of ever-increasing behavioral economics effects

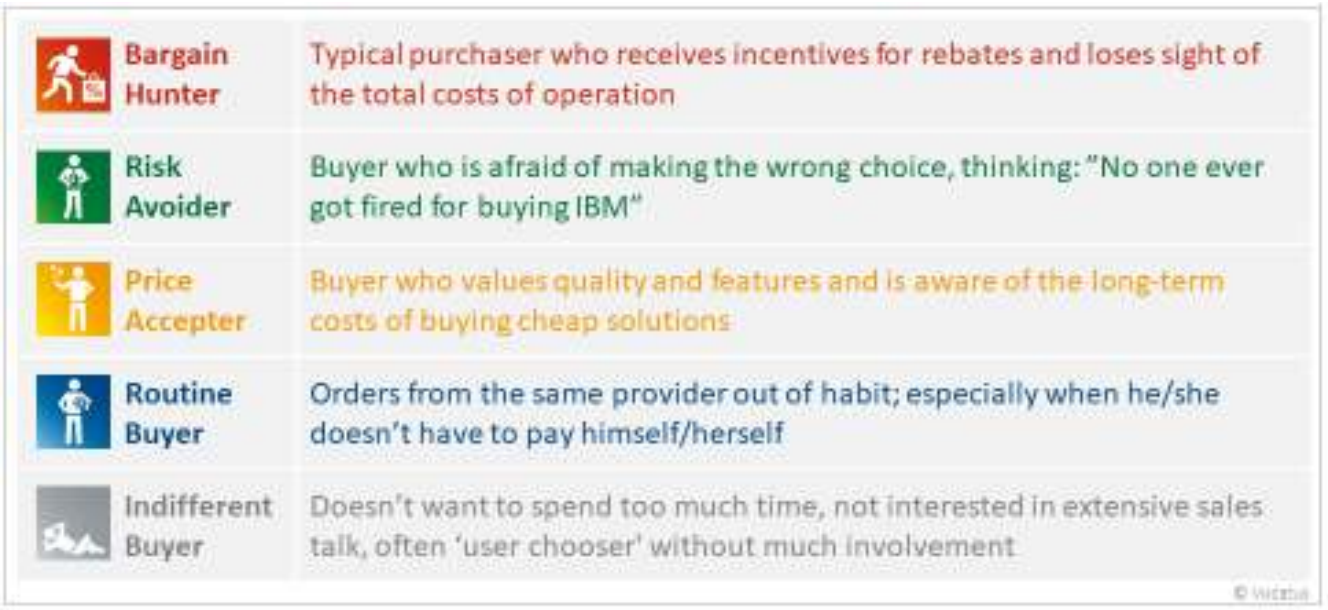

Figure 5: GRIPS in B2B.

harms the idea of applying behavioral economics in practice more than it helps: The negative, oversimplified 'Homo Heuristicus' model is a barrier to accepting the validity of behavioral economics, especially in areas like B2B. In addition, the application of nudging via copy-and-paste creates disappointments, as not every effect works in every situation, and it can even generate more and more contradictions.

The good news is, the combination of experience, situation, and heuristics solves the contradictions of the copy-and-paste approach, and it explains why which effects work in which situations. The decision typology GRIPS is (certainly not the only, but probably the best practically proven) a positive model that predicts and influences decision-making behavior, as it segments decision-making strategies (and the typical heuristics involved in these).

In sum, the key challenge for applying behavioral economics in practice is to understand which decision-making strategies are activated in which decision-making situations. What we can then do in marketing, pricing, and sales is to shape this decision context actively (choice architecture), in order to influence the likelihood of people using specific heuristics.

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Crowdsourcing Nudges: Insights and Experiences From Two Healthcare Systems

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Behavioral science-informed changes to choice architecture can help improve decisions and outcomes in healthcare. Given the complexity of the healthcare setting, involving numerous tools shared by stakeholders across a wide variety of specialties and roles, it is challenging to identify and prioritize problem areas and viable solutions to nudge more optimal patient and provider behaviors. Crowdsourcing can be a powerful means of generating innovation and prioritizing problems and potential solutions. Herein, we describe how the Geisinger Behavioral Insights Team and the Penn Medicine Nudge Unit implemented crowdsourcing competitions to solicit nudge problems and solutions from employees in two healthcare systems. Both nudge units found the competitions successful, not only in generating viable, novel project ideas, but also in increasing awareness of their work and helping them engage with relevant stakeholders within their respective organizations.

Introduction

Nudges, which are behavioral science-informed changes to how choices are organized and presented to decision-makers, have proven helpful in improving decisions and outcomes across numerous domains, including healthcare (Thaler & Sunstein, 2008; Patel & Volpp, 2012; Loewenstein et al., 2007; Halpern et al., 2007). They tend to be low-cost and preserve the freedom to choose, making them potentially attractive tools for healthcare systems as they attempt to overcome suboptimal behaviors—typically by patients and providers—to improve value of care, all the while facing pressures to minimize wasteful spending, including on low-value services (Berwick & Hackbarth, 2012; Porter, 2010). Nudges avoid mandating or "shoving" people toward specific choices in a complex environment where a single option will often not be appropriate for or acceptable to everyone.

Nudge units in healthcare, such as the Geisinger Behavioral Insights Team (BIT) and the Penn Medicine Nudge Unit (PMNU), have deployed and assessed nudge interventions across multiple clinical areas and delivery modalities (e.g., Patel et al., 2018; Patel et al., 2016a; Patel et al., 2016b), including, most recently, patient-directed text messages to increase influenza vaccination at upcoming appointments, which resulted in a 5% average increase in relative vaccination rates (Milkman et al., 2021). This exemplifies the potential usefulness of nudges. Yet, healthcare is multifaceted and complex, with innumerable areas where suboptimal behaviors prevent the execution and delivery of healthcare practices at their full potential. Aside from some guidance suggesting areas where the value of care delivered to patients can be improved—e.g., the Choosing Wisely Campaign for a reduction in unnecessary care (Cassel & Guest, 2012)—and statements of "best practices" that, despite their popularity and implied authority, can be surprisingly uninformed by evidence, there is often little systematic guidance for nudge units to decide (1) how to prioritize among problem areas, much less to

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identify (2) where feasible behavior-change opportunities exist and (3) what forms the corresponding interventions might take.

Crowdsourcing—the use of a large group of self-nominated volunteer contributors to gather ideas, materials, or other information in response to a need or want—is a mechanism of collective intelligence, which in this case refers to the phenomenon of groups performing a task better than experts or the group's own best-performing members (Malone, 2018; Surowiecki, 2004; Galton, 1907). Crowdsourcing has been used to improve forecasts of future events (e.g., Atanasov et al., 2016), discover more efficient algorithms to solve computational problems (e.g., Boudreau & Lakhani, 2015), and to unearth solutions to difficult engineering and scientific challenges (Lakhani et al., 2013). There is also some evidence that it can bear fruit in healthcare innovation (Terwiesch et al., 2013; Tucker et al., 2019; Ranard et al., 2014; Wang et al., 2020).

This article describes how two nudge units incorporated crowdsourcing competitions within their respective healthcare systems. The Geisinger BIT, established in 2018 with a minimal team, sought to increase familiarity with different areas of the broader organization and to develop a wider portfolio of projects than those initially identified. Therefore, one of the BIT's first priorities was to look to other stakeholders in the organization for suggestions. Following the lead of the PMNU, which had undertaken a similar initiative in 2016, the BIT developed and executed a crowdsourcing competition with the goal of learning what a diverse set of healthcare workers spanning the entire organization (and including clinical, research, administrative, service, and various other roles) had to say about what interventions were needed. The PMNU had sourced its participants from all members of the University of Pennsylvania Health System (UPHS), including physicians, nurses, staff, and students. The BIT also endeavored to establish a more extensive network of clinical and other stakeholders needed to form collaborative partnerships to execute and eventually scale up successful projects. Therefore, crowdsourcing was anticipated to be helpful in identifying the right people with whom to connect. At both the BIT and the PMNU, the crowdsourcing tournaments shared the following goals: (1) They offered an opportunity to raise awareness of the newly established nudge units among frontline clinicians and staff, as well as system leadership (including surfacing potential collaborators); (2) they provided frontline clinicians and staff an opportunity to feel more engaged (and hence have a voice) in how decisions were made regarding project prioritization; and (3) they helped identify potential opportunities for nudges to have a meaningful impact on improving healthcare.

Setting Up a Nudge Crowdsourcing Competition

In any healthcare system, an important first step in setting up a crowdsourcing effort is to get buy-in from leadership and other relevant stakeholders, given the need for system-wide outreach to employees. At Geisinger, the BIT convened a nudge crowdsourcing committee consisting of the BIT program director and faculty co-directors, Geisinger's chief innovation officer, the chairs of the Medicine and Heart Institutes, and the associate vice president of Product Innovation. An important consideration was to include leaders with sufficient clout and diversity of perspectives that they could provide both actual and perceived institutional legitimacy for the competition, in addition to providing a critical review of the submissions. The PMNU's committee consisted of the PMNU director, Penn Medicine's innovation director, UPHS's chief innovation, medical, medical informatics, and medical information officers, and other experts in behavioral science.

Several key decisions revolve around the format of a crowdsourcing competition, including but not limited to the:

- *Competition*. In the PMNU tournament, there were several rounds of a submission-based competition that ended with an in-person "Shark Tank" pitch day, where the ten finalists presented their ideas in an open forum with the PMNU advisory board as judges. The BIT, given the busy schedules and limited time of both healthcare workers and leaders on their committee, opted to judge only on the basis of the initial text submissions.

More complex approaches, such as allowing individuals to augment, update, or revise their initial contributions after seeing what others have done (Boudreau & Lakhani, 2015) may offer incremental benefits, but here we discuss "one-stage" methods whereby individual ideas are gathered and judged by the organizers of the competition.

- *Participants.* One must decide whether the audience should be only internal to the organization—and whether that should include all employees or only those with certain roles—or also external, allowing an even broader potential range of input.
- *Intake.* Data collection for submissions can take various forms, including an intake form built into a web page, a mobile application, or a survey. An online survey tool is a straightforward way for participants to submit their ideas, and the submissions are then easily downloaded as a spreadsheet of responses for categorization and analysis.
- *Incentives.* Rewards for prolific contributors or creators of the best ideas or solutions can spur increased participation and better-quality submissions. Rewards for participation itself can also be helpful in contexts such as healthcare, where employees may be busy and not in the habit of responding to such requests for their input. One must also be aware of legal and regulatory constraints on prize types and limits. The BIT's top three winners were given a choice from among three fun and/or practical devices (e.g., a smart speaker), while two runners-up and the remaining eight finalists received gift cards. The PMNU's finalist idea submitters could choose from among gift cards to local attractions and establishments or a fitness tracker. Both the BIT and PMNU selected at random, among participants with a valid submission, one who would receive a grand prize. This was intended to further motivate participation among those skeptical that they might win.
- *Judging the winners.* One must decide whether to have winner selections determined by peer review (e.g., by other submitters or by employees in the broader system), clinical stakeholders, the nudge unit, or some combination thereof. The PMNU opted for an approach wherein peers could comment on and rate the proposals of other UPHS members anonymously. Then, the committee narrowed the pool of ideas to fewer than ten finalists. The BIT opted to have submissions fed directly to its team: (1) The four members of the BIT categorized and independently rated the full set of submissions on a 1–5 scale reflecting their perceived relevance, feasibility, and importance; (2) the team agreed by consensus on only the most promising submissions to pass along to the crowdsourcing committee; and (3) the committee arrived at the final set of winners, based on a discussion of their feasibility, novelty over existing efforts, and importance to the system.

Execution

Additional decisions revolve around the execution of the competition, including:

- *Timeline.* The BIT and PMNU provided five weeks and three weeks, respectively, for people to submit ideas, in order to create some sense of urgency while also allowing time to formulate and submit suggestions. Timelines were also created and communicated for winner selection and prize dissemination.
- *Intake design.* It can be tempting to solicit a high degree of detail from participants, but given their presumed lack of time or familiarity with nudges, it is important to follow nudge principles in designing the intake (e.g., survey) itself, ensuring that it:
  - Is easy to fill out, short, and engaging (to encourage broad participation).
  - Is selective in terms of scope (to discourage submissions that do not lend themselves to nudge solutions).
  - Encourages participants to think through the problems they identify in such a way that submissions on average reflect true areas of need rather than just half-baked proposals or irrelevant personal interests (i.e., not just a "suggestion box"); both the BIT and PMNU made it optional to propose solutions, in order to minimize burden on submitters and to avoid missing out on important problem areas where the nudge units could themselves suggest solutions.

- *Intake dissemination.*
  - *Communication*. Potential participants should be educated briefly about nudges, given relevant examples thereof, and provided an easy way to access the competition. Both the BIT and PMNU opted for email as the primary modality for distribution, sending currently eligible recipients a description of the competition and a link to the competition website.
  - *Advertising*. Broad advertising, with repeated messages over time, helps increase awareness of the competition and ensure input from diverse areas of the system. Emails personally forwarded from leaders of various departments can provide additional legitimacy and authority to the requests for input, as can online presentations and question-and-answer sessions for the organization. It is especially important to rely on official organization-based sources for communications, given the prevalence of unsolicited and possibly malicious communications in modern industrial settings.
- *Categorizing the entries*. Labeling and categorizing entries into a manageable set is a helpful step toward judging the entries, as it allows for the quick identification of duplicates and inappropriate submissions, as well as the easy ranking of entries of the same type. This further enables a descriptive analysis and reporting of the submissions, both winning and non-winning. During intake, both the BIT and PMNU asked participants to categorize their submissions (e.g., improving care coordination, decreasing a low-value service, or increasing a high-value service). Ultimately, however, both teams used an inductive approach to categorize all entries, based upon the actual frequency and range of the response types received.
- *Results dissemination.* Finally, when the competition concludes, one must decide whether and how to release the results, which can help inform future proposals and determine ongoing engagement with such efforts.

Summary of Submissions

At Geisinger, there were 291 unique problems (with or without solutions) provided by 260 participants. At Penn Medicine, there were 225 submissions from 192 participants.

BIT members, using the 1–5 rating scale, identified 35 contenders for "finalist" status, prior to bringing these to the broader crowdsourcing committee. These contenders hailed from 27 departments and represented at least ten distinct problem areas. The 13 winners/finalists represented 12 departments, and their submissions included, in descending order from the three winners to the two runners-up to the eight finalists:

1. **Increasing flu vaccinations** by providing a $1 scratch-off lottery ticket incentive
2. **Reducing follow-up appointment no-shows** by giving patients an appointment card with a photo and a short bio of the provider
3. **Improving medication refills** with text reminder automated response options
4. **Increasing Geisinger's Medicare Advantage insurance plan enrollment** by indicating potential savings on healthcare invoices
5. **Reducing unnecessary blood count testing** by changing default order search results
6. **Improving appointment rescheduling** via automated text response options when patients cancel
7. **Increasing yearly well visit appointments** by inviting next-year scheduling at appointment checkout
8. **Increasing employee hand-washing** by applying brightly colored stickers to sanitizer dispensers
9. **Increasing online patient portal and mobile application enrollment** via default patient invitations upon electronic health record (EHR) enrollment
10. **Increasing patient adherence to health maintenance screenings** via reminders enabling automated ordering and scheduling
11. **Reducing inappropriate emergency room (ER) visits** via a triage mobile application
12. **Reducing inappropriate ER visits and delays** via a digital dashboard showing ER and nearby urgent care facility wait times

13. **Increasing timely physical therapy (PT) referrals and reducing unnecessary opioid use** via primary care default referrals to PT rather than a specialist.

The PMNU competition included 321 ratings of submissions provided by 57 people, with 24 people providing a total of 66 comments. The submissions of the three winners and six runners-up were, in descending order from the winners:

1. **Reducing inappropriate opioid prescribing** in the emergency department by changing default settings
2. **Improving cardiac rehabilitation referral rates** following inpatient cardiovascular events by using default options
3. **Reducing unnecessary imaging for radiation therapy** in palliative care via order set changes
4. **Improving access to medications** by defaulting prescriptions to Penn outpatient pharmacies
5. **Improving adherence and reducing costs** via automatic 90-day mail order supply for established medication prescriptions
6. **Increasing long-access reversible contraception prescription and use** in the immediate postpartum period
7. **Reducing unnecessary computerized tomography scans for suspected pulmonary embolisms** by using the Wells Criteria
8. **Increasing pharmacist-managed inpatient anticoagulation monitoring** to improve dosing consistency across patients
9. **Reducing appointment no-shows** via mobile application scheduling reminders

Beyond the winners, the BIT identified 20 relatively well-defined and prevalently used categories

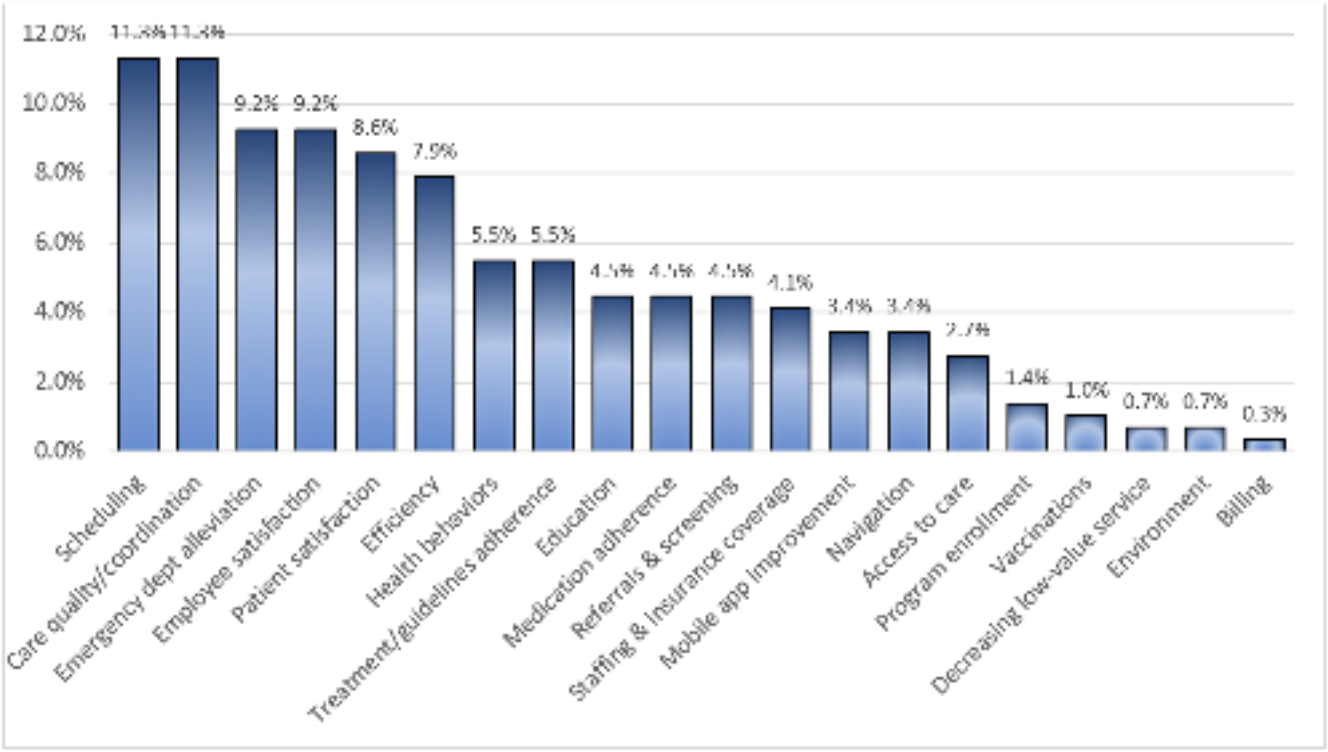

Figure 1: Geisinger BIT crowdsourcing themes. *Note:* Presented are the percentages of unique submissions (n = 291), broken down by problem type.

that accounted for all submissions (see Figure 1). Topics related to scheduling, care quality/coordination of care, the alleviation of inappropriate ER use, employee satisfaction, patient satisfaction, and efficiency were the most prevalent and accounted for a majority of submissions (57.5%).The PMNU identified several submission themes (see Figure 2). Individual submissions could be reflected

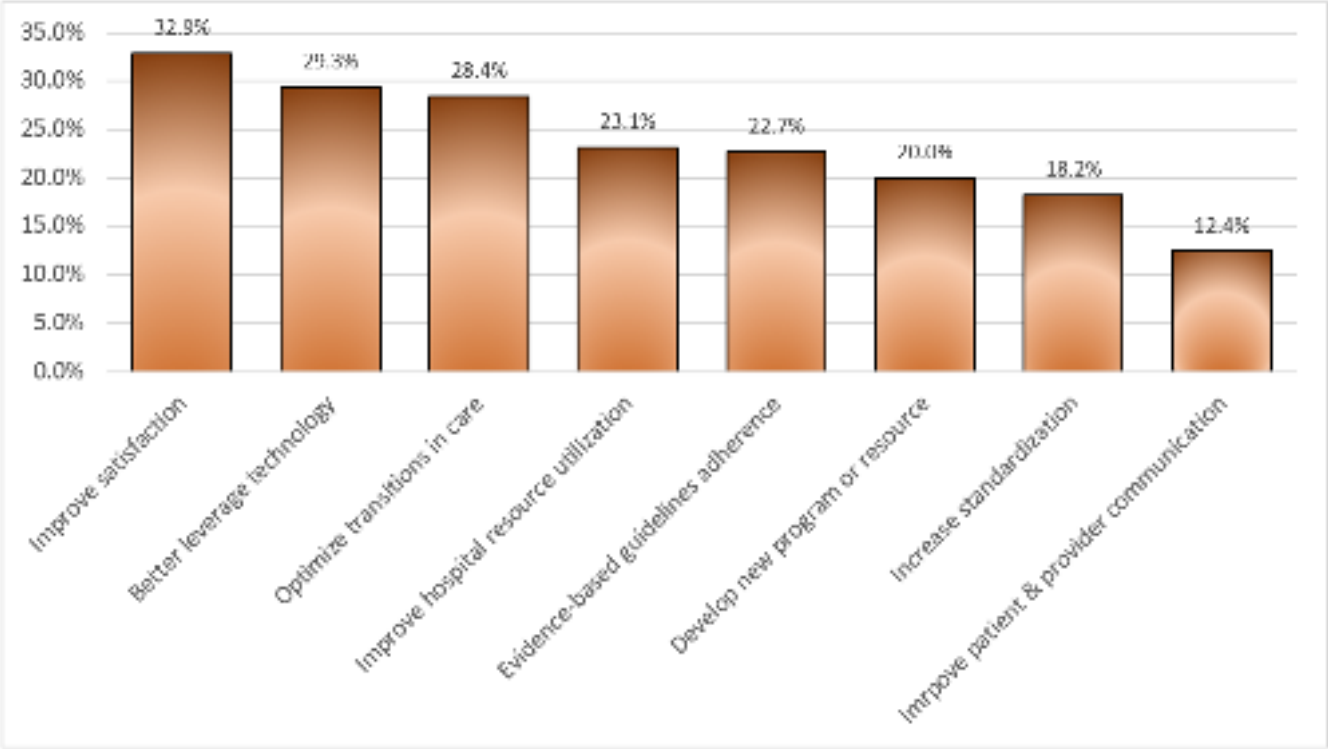

Figure 2: PMNU crowdsourcing themes. *Note:* Presented are the percentages of unique submissions (n = 225), broken down by theme.

in more than one theme, so the percentages shown do not sum to 100. The most common theme was improving satisfaction, followed by better leveraging technology and optimizing transitions in care. Proposed nudge solutions (n = 204) included alerts and reminders (35.8%), developing ways to enable choice (27.0%), changing default settings (23.0%), using incentives or disincentives to motivate behavior (7.8%), and restricting or eliminating choices altogether (6.4%).

Follow-up

The Geisinger BIT notified the winners, sent out prizes, and worked with Marketing to create an internal online article describing the competition and nudges, revealing the winners and prizes, and outlining the nine broad categories that the 13 winning submissions represented. The BIT also worked with the crowdsourcing committee to prioritize among winning submissions which projects to undertake. Several entries were investigated further, reaching out to submitters to see if they wanted to collaborate, and communicating with the appropriate departments and stakeholders to see how and where the proposed interventions could complement existing initiatives.

The BIT reflected on occasional challenges to implementation: (1) conflicts with similar interventions already underway, (2) lack of availability of appropriate stakeholders for collaboration, and (3) the prohibitive cost and/or timing of implementing relatively complex (e.g., technological) solutions, such as integrating mobile app use into the EHR or making significant changes to EHR and/or operations programming. The BIT had to adjust expectations and study designs to comport with current system priorities and to focus on feasible novel approaches. They advocated for randomized controlled trials wherever possible, but occasionally only a pre- vs post-intervention design was feasible or a retrospective comparison against a propensity-matched control group.

Still, several BIT projects were either directly or indirectly launched as a function of the crowdsourced submissions and are currently well underway or in the process of being implemented, thanks to connections forged with interested parties across

Geisinger: e.g., Clinical Informatics, Pharmacy, the Geisinger Health Plan, and others. The submissions included department and role information that helped educate the team regarding what types of problems were encountered or tackled by what types of stakeholders, so the BIT knew where to turn to for help. Stakeholders also reached out spontaneously to the team, having learned about the competition and the nudge unit running it.

The PMNU's original competition has resulted in published interventions: (1) doubling guideline-concordant prescribing from 21% to 43% by changing EHR default opioid prescribing quantities (Delgado et al., 2018), (2) quintupling cardiac rehabilitation referrals from 15% to 85% via a default opt-out EHR decision pathway (Adusumalli et al., 2021), and (3) halving unnecessary imaging from 68% to 32% during palliative radiotherapy for adults with cancer via order set changes (Sharma et al., 2019).

Discussion

We cannot quantify the precise return on investment of the crowdsourcing competition, intellectually (e.g., in terms of whether the competition yielded a higher quantity or quality of interventions than other potential approaches), logistically, or financially (e.g., in terms of whether the cost of the prizes and the time spent were offset by subsequent gains). Subjectively, however, we conclude that crowdsourcing was a great benefit to the nudge units, helping identify (1) innovative nudge solutions, (2) important problem areas in healthcare that can benefit from nudge solutions, and (3) connections to important potential partner stakeholders, as well as (4) increasing unsolicited subsequent outreach from others in the organizations who have become more familiar with the nudge units thanks to the exposure. The submissions, while representing a relatively small percentage of total potential participants, were nonetheless rich and diverse, thereby providing plenty of projects to consider. At the PMNU, crowdsourcing has become an annual part of the process to engage frontline clinicians and staff.

Penn Medicine is an academic health center, while Geisinger is structured as a more conventional healthcare system, albeit one that is also a health insurer for its members. These differences no doubt affected the range of participant roles—and hence types of submissions—in the two competitions. For example, the inclusion of Geisinger Health Plan employees likely allowed for more submissions focused on insurance-related issues and access to care. Other systems should consider the inclusiveness of their own participant pools with respect to the range of issues they would like to explore.

The BIT and PMNU both made the nudge suggestions optional, so the BIT was pleasantly surprised that only six participants (2.1%) had no solutions to offer, and similarly, the PMNU competition only had 21 participants (9.7%) fail to include a nudge intervention. On the other hand, it was not too surprising to see—in spite of the brief definitions and examples of nudges provided to participants—that submissions also included solutions that went beyond the typical scope of a nudge and seemed more appropriate for the "suggestion box", e.g., increased funding, added facilities, technological tool overhauls, and the development of new smartphone apps. Finally, a high proportion of submissions were aligned with key system priorities, perhaps reflecting the impact of communications from leadership and general awareness of common issues of concern across healthcare settings.

Conclusion

Two nudge units, namely, the Behavioral Insights Team at Geisinger and the Penn Medicine Nudge Unit, both found crowdsourcing to be a valuable way for their institutions to reveal important problems and novel nudge interventions that might solve them. We recommend a structured competitive approach, sampling from the frontlines of care, to other healthcare systems and institutions looking to accomplish the same. Several important considerations are detailed above, but for the effort to be successful, we emphasize in particular the need for buy-in from system leadership and stakeholders who will play a critical role in dissemination and in the final selection and prioritization of projects.

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Applying Behavioural Economics to Improve Hearing Aid Conversations Between First-Time Clients and Clinicians: The Development and Evaluation of Interventions to Increase Informed Choice

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National Acoustic Laboratories

For the first-time audiology client, considering which hearing aid to choose can be complex. Clinicians, too, struggle with balancing how to approach conversations and support clients. Default, rather than informed, decision-making means clients can miss out on beneficial experiences provided by premium-level hearing aids. This project aimed to tackle the problem by identifying and addressing cognitive biases that may be present during hearing aid discussions. Interventions developed to target these biases (including anchoring, confirmation bias, self-fulfilling prophecy and cognitive overload) were trialled and evaluated over a three-month period. Clinicians responded favourably to the intervention, and the results showed, compared to business-as-usual centres, an increase in the proportion of interested clients accessing premium-level hearing aids.

> The final common pathway for the application of nearly every advance in medicine is human behavior.
>
> —Patel et al. (2018, p. 214).

As for other areas of health, human behaviour plays a critical role in hearing healthcare. Significant scientific advances have improved our understanding of the hearing system and the technologies used for hearing assessment and rehabilitation, and yet long-term hearing health outcomes rely largely on the choices made by individuals. For the first-time audiology client,[1] the decision to book and attend a hearing appointment is an important first step. When a hearing loss is diagnosed, access to hearing aids relies on the clinician accurately conveying the relevant information in an accessible way, and the client deciding to proceed with a hearing aid fitting. However, even at this point, having made the necessary decisions to seek help and acquire a hearing aid, there is yet another decision to be made – *which* hearing aid to choose? It is this choice, and the context in which it occurs, that forms the focus of this paper.

Hearing Aid Choices

Hearing aid choices are presented, considered and made within the therapeutic environment of the client-clinician dynamic. Many clinicians report some level of difficulty in deciding how and when information about hearing aids should be shared with clients. They cite clients' clinical test results and preferences as key influencers for how they

[1] Throughout this paper, we use the term *client* when referring to audiology patients, clients and consumers. We use *clinician* when referring to audiologists and other professionals providing hearing health services. We use *hearing aids* and *devices* interchangeably.

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tailor the presentation of options (Boisvert et al., 2017). Whilst test results are reasonably objective, preferences are not. Pre-existing beliefs and unconscious biases are likely to be shaping both client preferences and also the clinician's ability to accurately perceive and respond to those preferences. Previous work has noted the influence of potential cognitive biases on clinicians' decision-making. , but no peer-reviewed studies have examined interventions that aim to reduce their impact (Galvin et al., 2020), and very little research has examined the effect of client biases. The current research uses a new approach in hearing health research – the development and evaluation of interventions, built on BE principles and applied to the problem of how best to support clients to make an informed choice about which hearing aid is the most appropriate for them.

Hearing aids vary in both form and function, and most companies offer a range of devices, from base- to premium-level products containing the most recent technology available, based on continuous research and development. This increasingly sophisticated technology is aimed at providing more comfortable, clear and easy listening experiences, and technological advances to hearing aids have been associated with increasing user satisfaction (Bishop & Eby, 2010; Picou, 2020). Clients are encouraged to choose hearing aids best suited for their needs, considering not only experiences offered by different technology (e.g., sound quality, connectivity, rechargeability, performance in noise), but also shape, size and – ultimately – price.

A Special Context: The Australian Hearing Services Program

In Australia, many clients make their hearing aid choice within the context of a government-funded Hearing Services Program (HSP). Administered through registered hearing healthcare providers, the program provides subsidised hearing services and hearing aids to eligible clients. Providers usually offer a range of different devices for clients to choose from. All offerings must include at least one device that is fully subsidised by the HSP[2], which ensures access to a nocost hearing aid option for all HSP-eligible clients. Most providers also offer a range of premium-level hearing aids. These are only partially subsidised, and therefore the client is required to make a contribution to cover the remaining cost.

The choice of either a base- or a premium-level hearing aid can be influenced by a range of client and clinical factors. A recent review found that, on average, approximately one-third of clients selected premium-level products over base-level hearing aids. However, across the 20 largest providers in Australia, this figure varies from 10% to 70% (PricewaterhouseCoopers Australia, 2017), suggesting that the processes, materials and approach taken by service providers has a strong influence on clients' decision-making.

The Problem – Are Clients Making an Informed Choice?

The research was initiated following a request from a large hearing healthcare service provider to examine their HSP-eligible clients' behaviour when accessing hearing healthcare for the first time, and to identify the key influences on decision-making. Only approximately 20% of their first-time clients were accessing premium-level hearing aids, which is considerably lower than the proportion of experienced/returning clients (with uptakes closer to the industry average).

Most HSP clients will not be re-eligible for subsidised hearing aids for a number of years, adding to the impact of their choices. The sponsor was concerned that compromised decision-making was influencing new clients to default to "free" base-level choices and miss out on the benefits associated with premium-level hearing aids. They wished to identify and ameliorate cognitive biases (in both clinicians and clients) acting as barriers to

[2] We will continue to use the term base-level to describe the fully-subsidised hearing aids, as they are lower-featured devices. However, as they must meet minimum quality standards set by the HSP, some may have additional features to some other commercially available base-level devices.

informed choice, so as to better support their first-time HSP clients to choose the right hearing aid for their needs.

Phase I: Identifying Roadblocks to Informed Choice

Method

Data collection

Appointment observations. Members of the research team observed first-time clients' hearing appointments, to understand clinicians' approaches to discussing hearing aid choices, clients' responses and the overall dynamic between the two parties.

Clinicians. Unstructured interviews were held with experienced senior-level clinicians and clinical trainers to understand better the context in which hearing aid choices are made. Information gathered from these conversations informed the development of online surveys and focus groups. Surveys asked questions about clients' uptake of premium-level hearing aids and perceived benefits, factors influencing client choices and the current appointment process. Eighty-four clinical staff responded to the survey, with 70% completing all items.

Two focus groups (one metropolitan and one regional) were held with 16 on-the-ground clinicians. Groups discussed how hearing aid choices were presented to clients, conversation pain points, and opportunities for improvement. Clinicians also participated in "persona-creation" activities in which they were asked to consider the characteristics of two fictional clients – one who would typically pursue premium-level hearing aids, and another who would not do so. This provided an opportunity to collect clinicians' professional insights into factors influencing clients' decision-making, whilst simultaneously providing the research team with insights regarding factors influencing clinicians' choices of when and how to have these conversations.

Clients. Existing online client surveys (distributed to all clients the day following their appointment) were modified to include items for first-time clients (eligible for hearing aids). Twenty-five clients completed these additional items asking about their experience of the appointment, including conversations about hearing aid choice and their beliefs about base- vs. premium-level hearing aids. The client survey included some items that closely mirrored items in the clinician surveys, thereby enabling comparisons of the perceptions held by the two groups.

Before attending their first appointment, semi-structured interviews were conducted with 17 "pre-clients" (who had not yet attended an appointment but were present at a hearing screening activity). The interviews focused on understanding clients' knowledge and beliefs about hearing aids when presenting at their first appointments.

Results

Analysis of the surveys, interviews and focus groups revealed three key factors that were adversely affecting client hearing aid decision-making:

1. Client beliefs around price and value: The impact of anchoring and zero-price effects

The cost of hearing aids was one of the most frequently cited concerns by clients and clinicians. Whilst available base-level devices are effectively zero-cost for HSP-eligible clients (and frequently described as "free" by marketers and clinicians), the client contribution for partially subsidised devices can reach over $5000 for premium-level hearing aids. Appointment observations revealed that many clients were unprepared for these prices, openly showing surprise or seeking clarification when presented with this information. Clinicians reported that these reactions created a barrier to further conversations. Clients (and clinicians) also described base-level hearing aids in a qualitatively different way to premium-level devices, using the perceived low-risk zero client contribution as a significant benefit.

Interviews with pre-clients further highlighted the low levels of awareness about pricing held prior

to appointments. When asked to estimate the worth of a pair of base-level hearing aids under the HSP, their responses ranged from $60 to $200.

Roadblock 1: These data make it clear that first-time clients' beliefs about hearing aid costs were inaccurately anchored. As a result, the client contribution required for premium-level devices was perceived as disproportionately high, leading to negative emotions and hindering further discussion. Furthermore, the zero-price effect of base-level hearing aids created inertia in clients that was particularly resistant to attempts to encourage them to consider the higher-priced premium-level options.

2. The impact of clinicians' beliefs on behaviour: Confirmation bias leads to a self-fulfilling prophecy

Appointment observations revealed high variability between clinicians in the way hearing aid choices were presented to clients. Most approached the conversation about premium-level products with hesitancy. Clinicians agreed they often spent relatively little time discussing choices. In particular, they would often change the focus of the conversation or not pursue the discussion with clients they considered resistant. Clinicians interpreted clients' questions about cost as a sign of concern and an indicator of their likely disinterest in premium-level devices. Some clinicians were observed to actively deflect questions from clients about premium-level

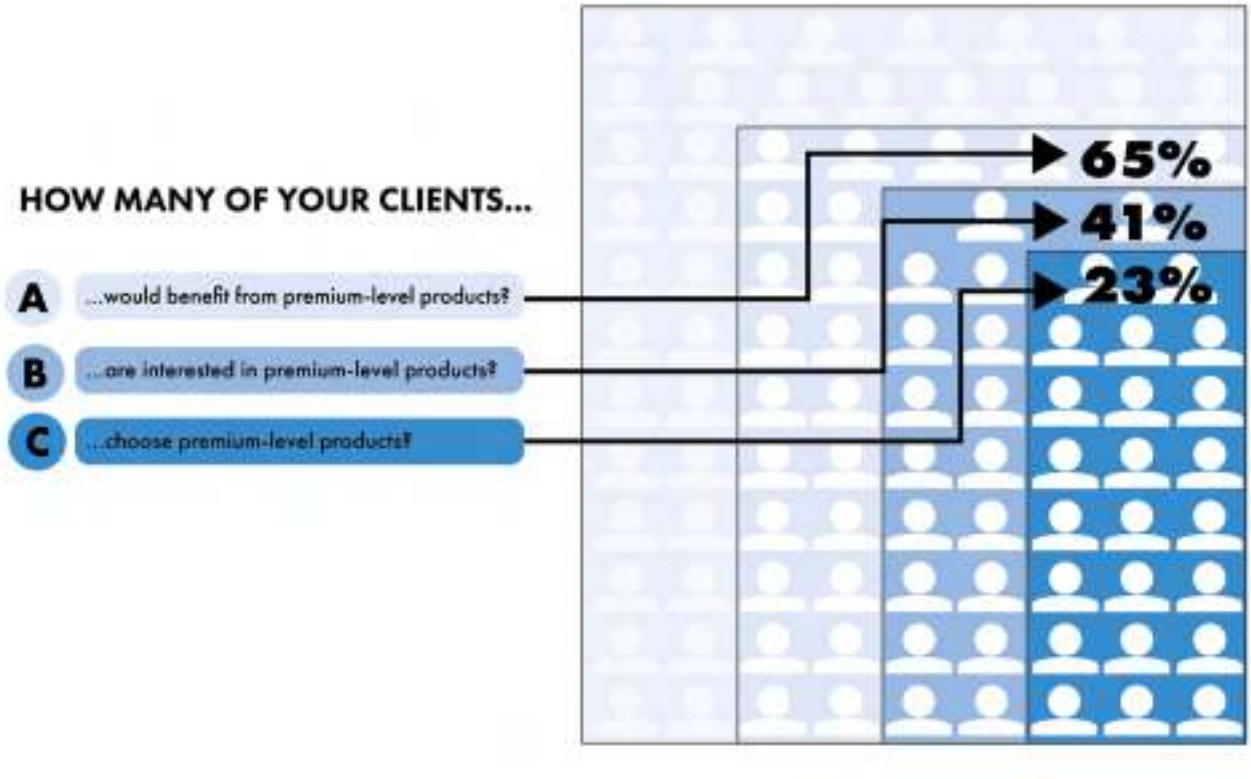

Figure 1: Clinicians' responses to the question asking, "What percentage of your eligible clients do you think...?"

hearing aids, instead responding with reassurances about the efficacy of the available base-level devices.

This behaviour was in contrast to the clinicians' feedback in focus groups, where they expressed frustration about their clients' unwillingness to discuss premium-level hearing aids and lamented the benefits that the clients were foregoing as a re-

sult. When surveyed, clinicians were positive about the value of premium-level hearing aids (Figure 1), believing that many of their clients would benefit from them. However, they believed that less than half of clients were interested in premium-level hearing aids – and that less than a quarter would choose them.

The difference between B and C in Figure 1 above (18%) potentially estimates the size of the intention-action gap at the heart of this work. It shows that almost half of clients whom clinicians believe to be interested in accessing the benefits of premium-level hearing aids are ultimately not choosing them.

A potential explanation may be related to a different gap – captured by the relative difference in reported beliefs for A & B. Focus group clinicians openly shared their hesitancy in discussing premium-level hearing aids with clients perceived as disinterested – behaviour that was also observed in appointments. Thus, the number of clients likely to receive information about premium-level hearing aids is only a proportion (potentially two out of three) of those who clinicians believe stand to ben-

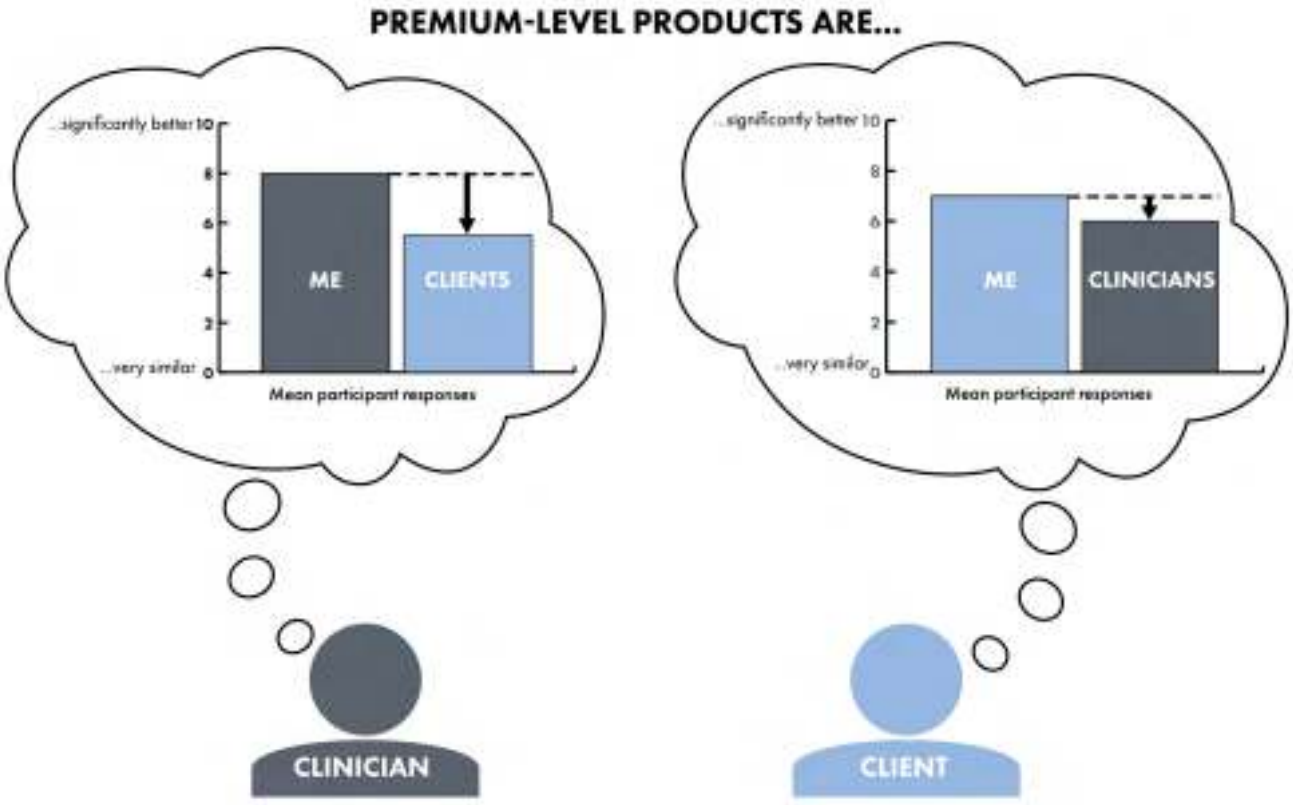

Figure 2: Clinician and client beliefs about premium- vs. base-level products.

efit.

When asked about the benefits of premium-level hearing aids relative to base-level devices, clinicians' responses showed they strongly believed in the advantages of the former but considered their clients were less convinced of their superiority (see Figure 2). This aligns with other clinician feedback, in that they generally believed clients to be sceptical about the value of premium-level options. However, clients' responses to corresponding survey items present an alternate story. Just like their clinician counterparts, they, too, held positive beliefs about the benefits of premium-level hearing aids. However, they reported perceiving clinicians as being the party less convinced about the superiority of these options.

Roadblock 2: These data showed evidence of a self-fulfilling prophecy resulting from confirma-

tion bias. Clinicians believe clients are disinterested in, or unable to afford, premium-level hearing aids, leading them to interpret clients' questions as a signal of their inability or hesitancy to consider these options. This is more pronounced when clients' responses include surprise or negative emotions around pricing. Clinicians' responses involve focusing attention on reassuring clients about the benefits of base-level options in an attempt to reassure them by downplaying any limitations of pursuing base- compared to premium-level options. Clients subsequently perceive clinicians to

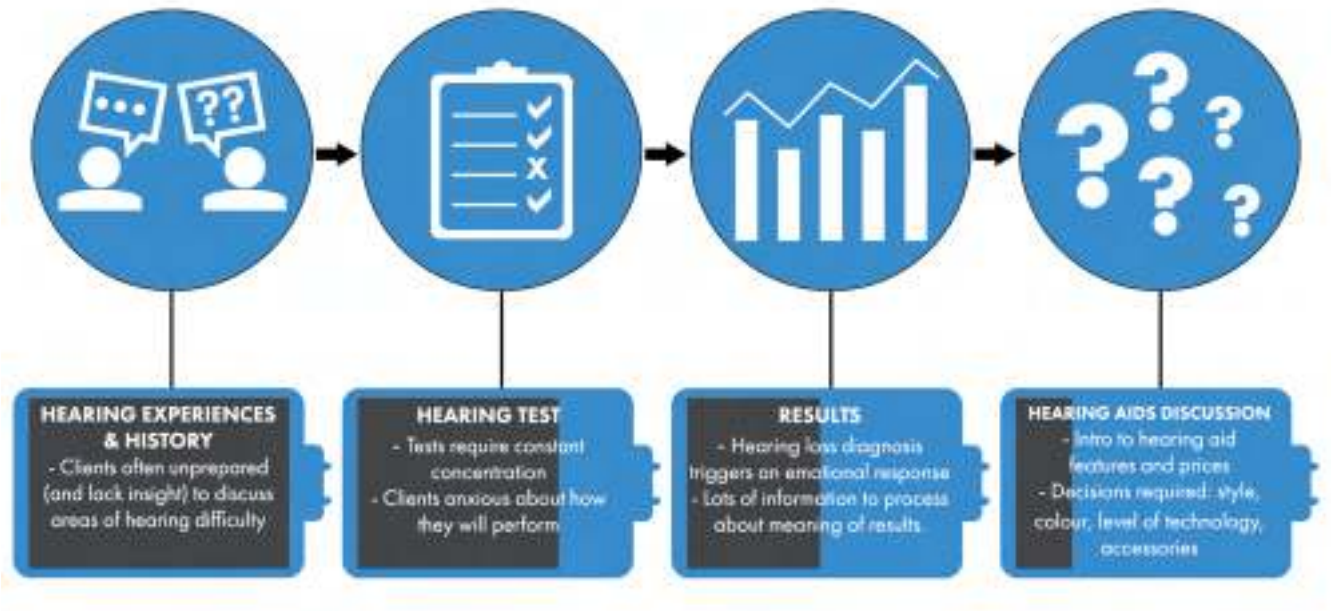

Figure 3: Elements of the hearing appointment and associated pain points.

be equivocal about the benefits of premium-level hearing aids, which reduces their likelihood to pursue them. Their decision further confirms the clinicians' original biased interpretation around client disinterest, thereby perpetuating the cycle.

3. Presentation of choice: A cognitive overload

Throughout the appointment, clients are required to engage in tasks with high emotional and/or cognitive load (examples shown in Figure 3). Clients expend considerable cognitive energy throughout the appointment, recalling salient hearing experiences and managing emotions whilst processing instructions and new information. There are low cognitive resources available to process the information presented in order to choose the best hearing aid for their needs.

In observations, choice presentation was inconsistent between clinicians and between clients. Clinicians reported wanting to remain neutral when presenting information, to maintain clients' autonomy, for instance, *'I don't want to come across as pushy or salesy'*. In surveys, clinicians reported believing that clients overwhelmingly preferred to receive information and make their own decision rather than follow advice from the audiologist (Figure 4). In contrast, clients' survey responses to a similar item showed that less than a quarter strongly identified as wanting to make independent decisions, with the majority having a strong preference for clinical advice.

Although clinicians believed that clients preferred to assess information about different hearing aids for themselves, their survey responses indicated concerns about clients' ability to do so (Figure 5). Clinicians acknowledged the large volume of information to be processed and its complexity, noting their clients often struggled, e.g., *'So many aid options, style options, platforms, features and accessories*

to consider. If it is overwhelming for audiologists, it can only be more so for clients'.

Roadblock 3: These data reveal that the context of hearing aid decision-making contains many factors associated with choice overload:

- Multiple cognitive demands throughout the appointment mean that the choice of hearing aid occurs at a time of maximal decision fatigue
- The costs associated with hearing aids and the relatively short timeframe of appointments contributes to decision-task difficulty
- The choice-set is complex – there are multiple levels of devices, many with their own set of options.

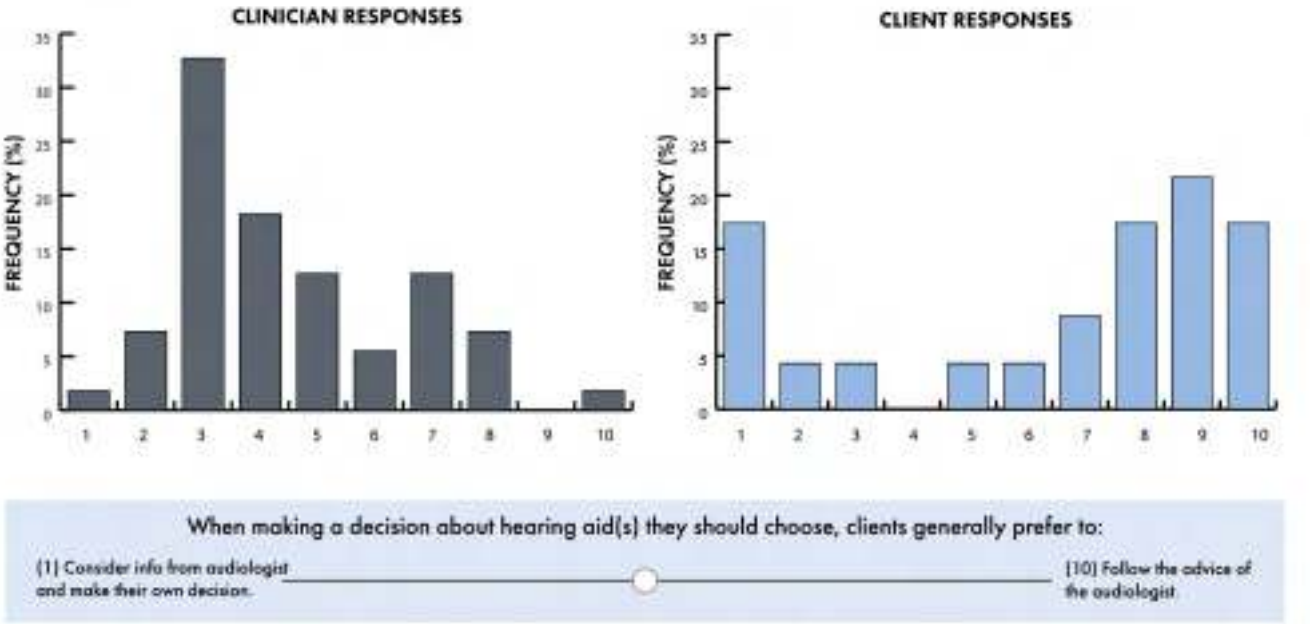

Figure 4: Distribution of responses (clinicians vs. client) regarding beliefs about a preference for autonomy and professional advice when making hearing aid decisions.

Faced with this overload, and in fear of making the wrong choice, it is perhaps unsurprising that clients turn to what they (and, often, their clinicians) see as a safer "default" choice, i.e. the fully subsidised base-level hearing aid.

Phase II: Intervention

Method

Procedures

Interventions were developed to address these three roadblocks and increase clients' ability to make informed choices about hearing aids.

Four broad changes were made to client appointments:

1. Adjustment to the presentation of premium-level hearing aid pricing: to reduce the impact of inertia caused by the zero-price effect.[3]
2. Restructuring the presentation of hearing aid choices (particularly within appointment discussions) by developing new processes and accompanying tools: to reduce choice overload for clients (whilst maintaining autonomy) and to counter clinician behaviours that lead to a self-fulling prophecy.
3. Provision of information to clients prior to appointments: to help them prepare for hearing aid conversations and reduce cognitive overload during the appointment. Also designed to provide an accessible introduction to hearing aid choic-

[3] NB: Pricing changes also included adjustments to address additional identified barriers not detailed here. Although they are tangential to the stated aim, they are mentioned here for completeness.

es (using the revised pricing and presentation structures outlined in 1 and 2) and more realistic anchors for hearing aid costs.

4. Clinician training: to increase clinicians' awareness of, and ability to address, the impact of confirmation bias and information overload influencing decision-making.

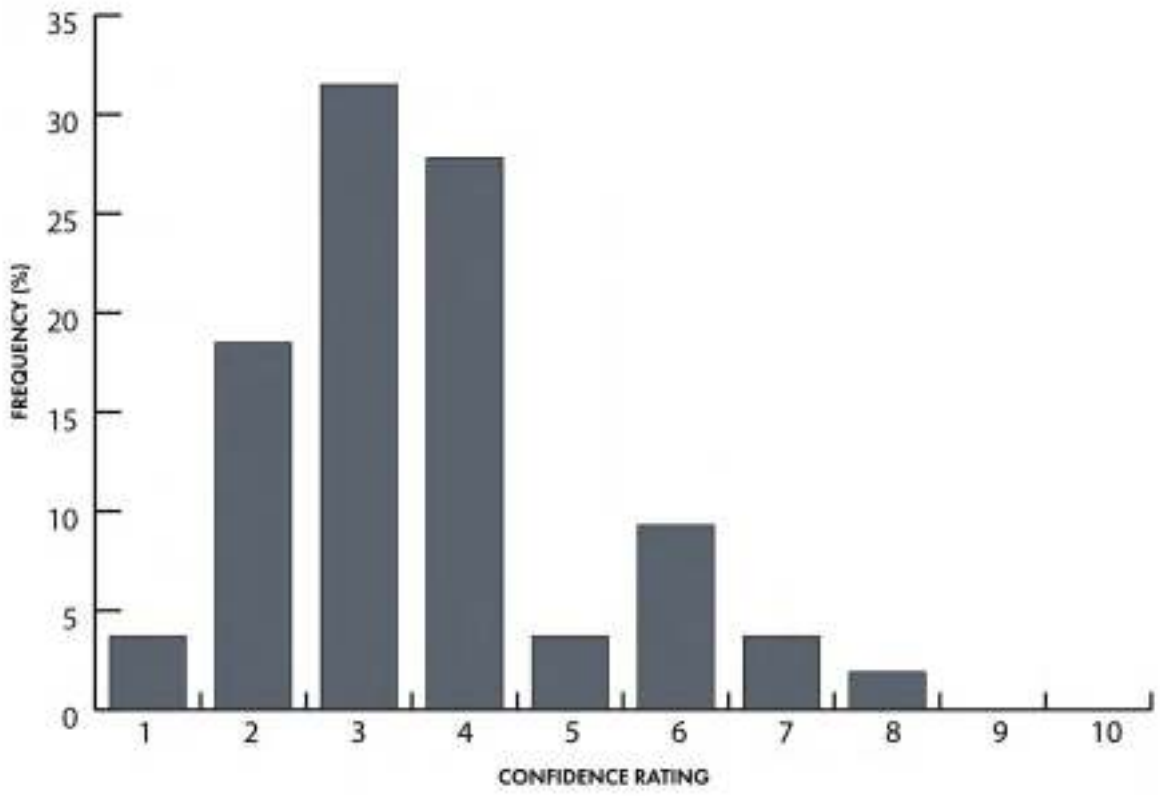

Figure 5: Overall, how confident do you think your clients are when differentiating between the benefits and features of different hearing aids? (10=very confident).

area during this time. As a result, the decision was made to evaluate the effects of all changes ('full-implementation'; 1-4) against a group implementing the "pricing-only" intervention (1). Both groups had equivalent numbers of first-time HSP-eligible clients proceeding with a hearing aid fitting.

To assess the success of the interventions in each group, we measured the change in percentage uptake of premium-level hearing aids compared to baseline data from the nine months prior to the intervention trial. We compared data from the pricing-only group vs. the full-implementation group and compared both of these to a control group of non-participating hearing healthcare centres.

Clinicians in the full-implementation group were surveyed about the intervention's impact, and we also monitored the sponsor's regular client satisfaction survey responses for both groups.

Results

Device uptake

The change in uptake of premium-level hearing aids was an increase of only 1% for both the control group and the pricing-only group. In contrast, the full-implementation group recorded an increase of

	Uptake Rates (%)		Increase from baseline
	Baseline	Trial period	
Control	21	22	5%
Pricing-only	15	16	7%
Full-implementation	17	34	100%

Table 1: Percentage of first-time HSP-eligible clients selecting premium-level hearing aids at baseline and throughout intervention trial.

17% – effectively doubling the proportion of clients selecting premium-level devices (see Table 1).

Clinician and client feedback

Clinicians showed high levels of engagement throughout the trial period, and there was a 60% completion rate for the survey. Clinicians in the full-implementation group rated interventions 2 and 3 as most important for improving informed choice for clients. All clinicians reported that during the trial, they approached hearing aid discussions with their clients differently, with all but one (who recorded a neutral response) reporting that they considered the changes had made a positive impact.

Clients' responses to the sponsor's satisfaction survey remained positive throughout the trial period. Data analysis showed that respondents' satisfaction ratings were at ceiling prior to the commencement of the trial, and they remained there throughout.

Discussion

Hearing aid users generally keep their hearing aids for several years, which underlines the importance of first-time clients making the best choice, right from the start. This project identified some of the critical client and clinician biases that operate in the context of hearing aid decision-making and designed a suite of interventions to address biases and reduce the proportion of clients opting for the "default" choice.

Although pricing was considered by many to be the main barrier to clients choosing a premium-level hearing aid, our results showed that pricing changes alone had virtually no impact on their behaviour. This finding supports previous work showing that although cost may influence decisions to acquire hearing aids in the first place, it does not appear to be the key driver when choosing between different options (Ramachandran et al., 2011). Our results suggest that hearing aid choices are more heavily influenced by the context in which they are presented, including the interaction between client and clinician.

As health professionals, audiologists are motivated by a desire to provide client-centred care grounded in a strong evidence base. The current study found that for many clinicians, this approach means they see their role as a neutral provider of information to clients, who should be left to make their own decision. The problematic nature of this approach has been noted previously: 'This behaviour... appears to shift decision-making control and responsibility to the client... and does not acknowledge the importance of providing decisional support to patients throughout the decision-making process' (Boisvert et al., 2017, p. 9). The clients surveyed in the current study also agree, with many expressing a desire for "more" from the health professional whose assistance they have sought.

Limitations

The main limitation of this project was that multiple interventions could not be trialled concurrently. As a result, the outcomes reflect the impact of the

entire package of interventions, and it is not possible to determine the relative effectiveness of individual elements. Further work would be required to determine how implementing a smaller set, or individual elements, would affect the results.

Conclusion

A key part of this work involved identifying how cognitive biases influence not only the behaviour of individual clients and clinicians, but also the client-clinician dynamic. Clinicians, like many health professionals, are constantly processing information to decide how to proceed "in the moment." Like clients, they, too, are susceptible to misperceptions and missteps as a result of biased perceptions and beliefs. Understanding and addressing the client-clinician dynamic is important for improving the quality of conversations and related decision-making. This is true not only for hearing, but also for many healthcare decisions. Designing and implementing processes that target specific client behaviours and also address the underlying needs of clinicians and clients are likely to be successful in bringing about lasting change in clinical practice and long-term benefits for health outcomes.

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Elizabeth Beach, Ph.D., is the former Head of the Behavioural Sciences Department at the National Acoustic Laboratories, Australia. Her research covered a range of issues relevant to hearing and hearing-related behaviours, including leisure noise exposure and its impact on hearing health, the development of strategies for encouraging safe listening for staff and patrons and motivating young adults to protect their hearing. She also worked on projects related to improving the delivery of hearing health services and streamlining decision-making processes for clients with hearing loss, using behavioural insights.

Brent Edwards, Ph.D., is Director of the National Acoustic Laboratories (NAL), where he is currently leading new innovation initiatives that focus on transforming hearing healthcare. For over 22 years, he headed research at major hearing aid companies and Silicon Valley start-ups that have developed innovative technologies and clinical tools used worldwide. Dr. Edwards founded and ran the Starkey Hearing Research Center in Berkeley, California, which was a leading site for research in hearing impairment and cognition. Dr. Edwards is a Fellow of the Acoustical Society of America and an Adjunct Professor at Macquarie University.

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BI Org: Fostering a Behavioural Mindset at the OECD

*Faisal Naru and Kate Laffan**

OECD

The OECD is hard at work fostering a behavioural mindset across the organisation. In the current paper, we detail the 4 Ps behind our efforts: the principles, practices, proof and phases. In doing so, we aim to provide a blueprint for other organisations looking to promote management excellence through the application of behavioural insights.

Introduction

The past decade has seen exponential growth in the application of behavioural insights to public policy challenges. To date, both academic research and the world of practice have largely focused their efforts on issues around policy implementation and on targeting individual, and in particular consumer, behaviour change. In other words, work has been directed at the "micro-level." As the field matures, increasing attention is being paid to the potential of behavioural insights to speak to meso-level issues, including asking the question: how can behavioural insights contribute to organisational change (Gavetti, 2012; Stingl, & Geraldi, 2017; Shepard, 2017; OECD, 2017; OECD, 2020)?

This question has been front of mind at the OECD. Josée Touchette – the OECD's Executive Director – is committed to innovating operations to meet the needs of the organisation's stakeholders, now and in the future. She considers behavioural insights an invaluable part of the organisation's toolkit with which to achieve this goal.

> The use of behavioural insights married with data visualisation and strategic thinking is essential in modern management.
>
> -Josée Touchette

Over the past several years, the OECD has developed and rolled out behaviourally informed workstreams in several corporate areas, from recruitment to cybersecurity, to responsibilities of staff and beyond. Some of these projects have emerged from applying a behavioural lens to examining ways to improve the delivery of services within the organisation. Others have come about through reflecting on evidence emerging from the behavioural science literature and the evolving needs of the organisation's stakeholders.

The application of behavioural insights is well-aligned with the OECD's scientific, data-driven and human-centred approach to understanding and addressing the operational challenges that arise in the running of the organisation. Their use also demonstrates the OECD's commitment to 'walk the talk' and lead in implementing good practices that it recommends others adopt (OECD, 2017). With this article, we seek to provide a blueprint for other institutions looking to draw on behavioural insights to bring about organisational change.

In what follows, we detail the 4 Ps behind our effort to foster a behavioural mindset at the OECD, namely principles, practices, proof and phases. These four elements capture the current thinking and behavioural work going on within the OECD'S Executive Directorate, as well as plans going forward.

1. Principles

Setting out clear guiding principles ensures

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not only that opportunities to apply behavioural insights are systematically identified, but also that projects are ultimately aligned with the organisation's goals. The behavioural work within the OECD is guided by the following principles:

- **Recognise that people are human.** We apply a behavioural lens to the challenges that we face. This involves identifying behavioural barriers to desired outcomes, as well as potential solutions. This approach stands in contrast with process-driven approaches that do not properly account for individuals' motivations, both intrinsic and extrinsic, or their behavioural biases and tendencies.
- **Be cognisant of our own limitations and co-produce knowledge.** We are mindful of our own biases and limited information. We do not fool ourselves that we are objective or that we automatically know what is driving an issue or how best to solve it. Instead, we seek to co-produce knowledge with our stakeholders, adopting a 360° approach in which people at all levels of the organisation have the opportunity to feed in their experiences, opinions and suggestions. As a team, we encourage a healthy challenge function that recognises and addresses assumptions.
- **Align work with existing organisational principles and goals.** Our behaviourally informed work is aligned with the organisation's ethos. This includes upholding ethical standards, safeguarding organisational integrity and promoting social, economic and environmental sustainability within the organisation, among other things. It is also important to demonstrate organisational empathy, which the behavioural and social sciences can help instil through the use of appropriate language, messages and timely actions. These higher-order goals not only help shape the issues we look at through a behavioural lens, but also act as the litmus test for the solutions we propose.
- **Expand beyond traditional "nudging"** when considering how to shape behaviour. Nudges undoubtedly have a role to play in encouraging behaviour change within organisations, including at the OECD (e.g. see Cybersecurity in the Proof section). In many cases, however, organisations will have harder policy instruments in place – for example, regulations or financial structures – and behavioural insights can inform the design and implementation of these instruments, too (see Carbon Pricing in the Proof section).

2. Practices

While many of the features of the OECD's behaviourally informed work vary significantly, depending on factors such as the area of focus, the timeline for delivery and the scope for intervention and evaluation, many practices remain constant. These practices represent suggestions for others looking to embed behavioural insights into their organisation.

- **Identify the important behavioural and structural components of the issues that arise.** The solution to many operational challenges lies in behaviour change. At the same time, it is important to recognise that individuals operate within constraints, including those relating to time, resources and know-how. Often, structural constraints need to be addressed to make behaviour change possible.
- **Seek out quality data and use data visualisation tools** to understand and communicate operational challenges. Operational data, such as on the number of emails sent or flights booked etc., is often a valuable but underexplored resource that can provide insights.
- **Look to insights from state-of-the-art literature in behavioural science and the opinions of experts in the field to inform work.** There exists a rich body of behavioural science literature that can help inform organisational practices, and academics are often keen to partner with organisations to carry out translational work, as well as new research.
- **Demonstrate and communicate impact.** Robust evaluation strategies help identify what works, as well as what needs more work. Clear behaviourally informed communication strategies help build awareness of the work and ensure transparency among stakeholders. Importantly, insights from behavioural science can act as valuable inputs into decision-making, even when evaluation is not possible.

- **Adopt an iterative approach.** Organisations typically operate in dynamic environments and have to balance the needs of multiple stakeholders. It is important to improve on and adapt behavioural efforts continually as new information emerges and contexts change, always keeping the organisation's overarching goals in mind.

3. Proof

Within the OECD, behavioural insights have fed into efforts to understand and shape both organisational policies and practices and the behaviour of our employees while at work.

The proof, as they say, is in the pudding. In what follows, we present a snapshot of four examples of how behavioural insights have been applied at the OECD. These examples relate to cybersecurity, delegations of authority, hiring and carbon pricing. Importantly, these examples do not represent one-off projects but rather ongoing streams of work.

Cybersecurity

Like all large organisations, the OECD is subject to phishing attacks. On average, it experiences 300 attacks a month. While the organisation employs state-of-the-art technical cybersecurity measures, OECD staff remain the first line of defence against data breaches. To optimise cybersecurity, employees should avoid opening and clicking on phishing attachments and links, and also report the attacks internally to the digital security team.

The OECD'S executive directorate has explored a range of behaviourally informed communications to promote these behaviours. For example, in an email-based field experiment, OECD staff received communications from the digital security team which indicated the correct actions to take when they suspect they have been targeted by a phishing attack. They were randomly allocated either to receive one of four messages or be part of a control group that did not receive any communications on the topic.

The treatment messages were informed by previous work on risk communication (Sopory, 2017) and email interventions (Service et al., 2014). They consisted of 1) a standard message that flagged the prevalence of phishing attacks; 2) a message that made salient the correct courses of action by highlighting them in red at the beginning of the email; 3) a message that emphasised the recipient as having been personally identified as a target for phishing attacks and 4) a message presenting a metaphor involving credit card details, to emphasise the risk of phishing attacks.

The impact of the messages on both clicking and reporting was evaluated, using employee responses to fake phishing attacks that came from the digital security team. The results indicate that the personal and risk-based messages increased reporting by 150% on average compared to the control group, with the risk being the more effective of the two strategies. The evaluation also identified 12% of staff as 'risky clickers', in that they both click and do not report. This group will be the focus of further work on this topic.

Delegations of Authority

Delegations of authority are formal means for officials within the OECD who have been entrusted with the responsibility of a budget by the Secretary-General to share this responsibility with other officials. These delegations apply to a wide range of tasks, including authorising travel for guests, accepting delivery for payment and approving budget commitments.

In 2018, the OECD introduced an e-Delegation tool for use across all of the directorates and programmes. It is an automated, paperless, transparent process with organisation-wide standard text and templates, thus providing a clear audit trail. Entering a delegation of authority into the system triggers an electronic request for acceptance by the selected staff member. It is vital to the organisation that staff members in receipt of these requests carefully engage with the details of the DoA and in particular are cognisant of the responsibility they are taking on when accepting the DoA and subsequently while at work.

Research from the behavioural sciences emphasises the benefits of personalising communications, as well as making important information salient

(OECD, 2017). Other work indicates that gamification can improve engagement in learning activities. In this regard, multiple-choice quizzes have been shown to enhance learning, engagement and enjoyment (Cheong et al., 2013).

Drawing on these behavioural insights, the OECD'S Executive Directorate has developed an interactive and visual tutorial explaining the nature of the DoAs and the responsibilities involved, as well as a quiz that assesses learning and provides feedback on staff members' understanding. Staff members who are assigned to DoAs receive personal invites to engage with these materials, to help them understand and be aware of what they are agreeing to.

Hiring

Existing research in the behavioural sciences has identified important sources of bias in hiring, including in interview processes, with implications for the diversity of hired candidates (Bohnet, 2016). In 2020, the OECD'S Executive Directorate spearheaded an initiative to identify the best way to assess candidates at the interview stage, in order to ensure fairness within the process.

In line with this goal, the OECD'S Executive Directorate carried out a field experiment to explore the relative impact of conducting video vs. phone vs. transcript interviews. This exploration was developed based on the insight from behavioural science that blinding recruiters to candidates' demographic characteristics can work to debias hiring processes (Goldin & Rouse, 2000). The primary outcome of interest in the field experiment was the scores given to each candidate across the different media types, and the analysis explored how these scores varied based on the candidates' gender, nationality and language skills.

The results indicate that female candidates scored similarly to men across all three mediums (video, audio, transcript). At least at the OECD, therefore, we have evidence to suggest that the interview format does not appear to promote the hiring of one gender over another. This "null" finding emphasises the importance of testing behavioural insights in context.

Ongoing projects which build on this work are examining the influence of the physical and professional appearance of candidates on hiring decisions and evaluating the potential of virtual reality training, which mimics OECD interviewing conditions, to support inclusive hiring practices (Mobius & Rosenblat, 2006).

Carbon Pricing

The OECD implemented an internal carbon price in 2013. Under this initiative, directorates are charged a flat rate of 30€ per tonne of CO2 emitted by air travel on missions. The funds from the initiative are used to purchase carbon offsets and fund projects related to improving the organisation's environmental performance. With the help of this initiative, the OECD achieved carbon neutrality in 2020. However, mission flights still account for a large share of the organisation's pre-offset carbon footprint, so there is room to further enhance the sustainability of the OECD's travel behaviour.

While this initiative involves a hard policy instrument aimed at reducing flying behaviour, there are lessons from behavioural science that can speak to both how this price is structured and how it is communicated to staff. For example, research from the internal carbon pricing system at Yale University identified that a redistributive carbon price, in which revenues from the scheme were redistributed from poor-performing to well-performing buildings, was the most effective structure among a range of different strategies (Gillingham et al., 2017). Other work indicates that the way carbon prices are communicated matters, too. Tactics such as normative messaging, indicating what the revenue from the taxes will be used for, and inducing personal responsibility for carbon emissions all aid in increasing support for and the effectiveness of the policy (Hurlstone et al., 2014; Bristow et al., 2010; Ünal, Steg & Granskaya, 2019).

Having reviewed the existing behavioural science literature on carbon pricing, as well as patterns around pre-pandemic flying behaviour from our operational data, the OECD's Executive Directorate is in the process of exploring a selection of these insights – in the context of the OECD's carbon price – in both qualitative interviews and contingent

choice experiments with key stakeholders. Looking forward, these exercises will feed into the organisation's carbon pricing policy.

4. Phases

The workstreams highlighted in the Proof section represent the first phase in a long-term strategy to promote and mainstream a behavioural mindset across the organisation. The work carried out to date has been led by behavioural scientists working internally in the office of the Executive Director but has drawn on the skills of communications and data visualisation experts and involved interested and willing staff members from across the organisation. Involving people with a range of complementary skills, and interested partners, has allowed us to apply behavioural insights successfully to strategically important areas, as well as effectively communicate the value-added of this approach. It also helped create behavioural champions, and in doing so it has begun to embed behavioural thinking across different areas of the organisation.

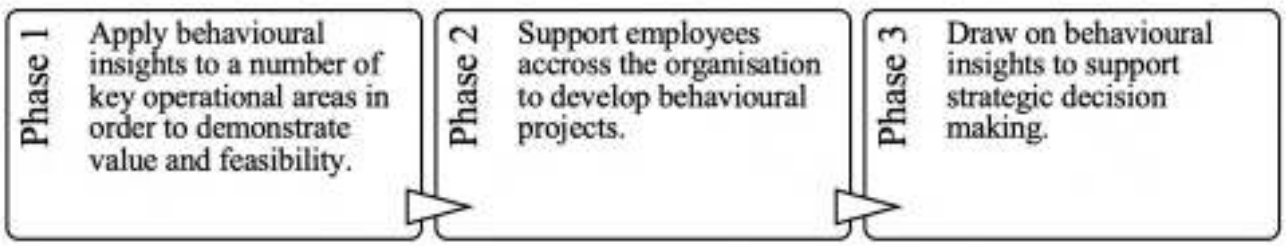

Figure 1: Fostering a behavioural mindset at the OECD: A phased approach.

In phase two of the mainstreaming strategy, the Executive Director's office will act as an incubator, playing a supporting role for the bottom-up behavioural workstreams that are emerging across the organisation. This work largely stems from those employees who contributed to the Phase 1 workstreams, many of whom now regularly apply a behavioural lens to understanding their own operational challenges and have gained the confidence to lead on a workstream of their own. Key tasks for the team in the Executive Director's office in Phase 2 include supporting these people to identify strategically important research questions and design rigorous evaluations, as well as helping, where necessary, to interpret the results.

To leverage BI further in the promotion of operational excellence, Phase 3 will see the OECD's Executive Directorate's behavioural work move further upstream, asking: How can behavioural insights be used to help support strategic decision-making in the organisation? The projects involved in Phase 1 and Phase 2 largely focus on using behavioural insights to provide clarity on the problem, communication and policy implementation. Phase 3 is about improving decision clarity, especially in an ever-complex, dynamic and uncertain environment. Clinical consciousness of one's own decisions, as well as clarity in the understanding of those decisions by stakeholders, especially those affected, is a critical part of management excellence. In Phase 3, we will leverage BI to promote decision clarity throughout the organisation. This will include, for example, designing the choice criteria for strategic decisions and the processes by which those decisions are made, as well as clearly communicating the decisions that are being made, by whom and how.

Conclusion

Through adhering to our principles and engaging in the core practices, we have developed a series of behavioural projects at the OECD, as well as a roadmap for future work. Plenty of questions and opportunities remain, but we are well on the way to fostering a behavioural mindset inside the organisation. We would encourage other organisations to consider doing likewise and to help lead the way.

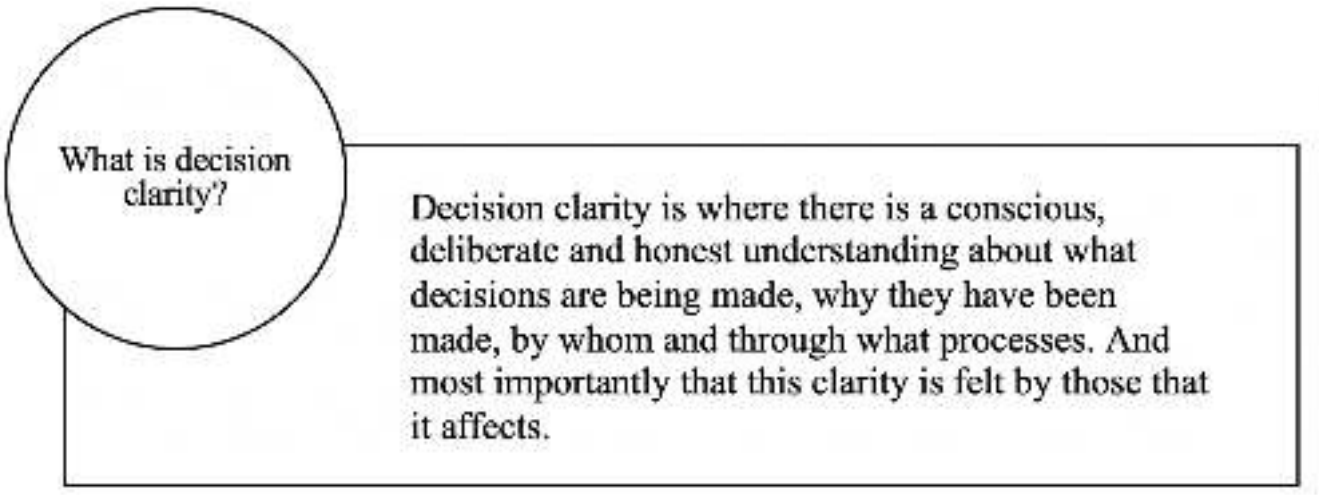

Figure 2: Our working definition of decision clarity.

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Complex Behavioral Challenges Require Multi-Faceted Behavioral Solutions: Driving Change in Sustainable Agriculture

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Behavioral science has been criticized for developing solutions that are only tractable for easy challenges, and even then, generally have small impacts. However, this is not a limitation of the behavioral science approach per se but rather of the common narrow focus on nudges. Instead, we propose that intensive, multi-layered behavioral science solutions are necessary for addressing what might otherwise be seen as intractable behavioral shifts. To demonstrate this point, we showcase the development of the Lands for Life program in Colombia, designed to increase both the environmental and the financial sustainability of rural farming. This challenge is of particular interest, due to both its significance and difficulty, as the target behavior is nothing short of community-wide shifts in farmers' fundamental livelihoods. Built from the ground up to incorporate behavioral insights, the program draws on the theory behind the key phenomena of social proof to overcome ambiguity aversion, as well as social pressure to drive pro-social behavior. In this article, we present a case study analysis of how this multi-stage intervention incorporates these and other behavioral insights in a three-phase process which, instead of focusing on the individual, focuses on community-wide changes that deliver transformative results more effectively than traditional nudges.

Introduction

The behavioral sciences have been increasingly criticized for targeting the "low-hanging-fruits" of behavior change while achieving only marginal effects (Spencer, 2018). As a result of this focus, behavioral science has been slow to tackle problems that require more than marginal shifts in behavior, ignoring some of the most pressing, wicked, or simply just complex problems of our time.

But why is this the case, and how can the field move past targeting these "low-hanging fruits" to address more systemically complex challenges such as rising inequality, healthcare, and even climate change? While identifying clear and reliable marginal shifts were perhaps necessary in the early days of applied behavioral science to demonstrate the applicability of key strategies, the field has now matured sufficiently to be able to learn from the limitations of our traditional approach and allow for the tackling of more multifaceted problems (Nesterak, 2020; Sanders et al., 2018; Spencer, 2018; Van Der Linden, 2018).

We propose that the next phase of behavioral science-driven programming will break away from the singular focus on choice architecture through marginal nudges, moving instead towards the intensive, multi-faceted, and behaviorally-informed solutions necessary for addressing what might otherwise be seen as intractable behavioral shifts. Yet, simply calling for such a shift does not make it so. Nor does it offer a blueprint for what this approach will look like. In this article, we present the Lands for Life (L4L) program, designed by the environmental behavior change non-profit Rare, which strategically applies staged and layered behavioral change interventions by using a variety of behavioral levers to go beyond norm *messaging* and into the realm of norm *shifts*. Through this case study, we show how a precise and organized set of

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strategies can be combined to help a 'social proof' program snowball into one that leverages a growing constituency of sustainable farmers to create 'social pressure' on others to do the same—ultimately creating a self-enforcing norm in which farmers, their communities, and the climate stand to collectively benefit.

The Limits of One-Size-Fits-All Nudges

According to Thaler and Sunstein, nudging is "choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives" (2009, p.6), thereby crafting a choice environment to encourage behavior change without altering the value of—or access to—the options available.

The idea that behavior can be *cheaply* and *meaningfully* influenced by *simple* changes to a choice's "architecture" has proven extremely popular. It would be no exaggeration to say that many have come to view and treat nudging as a silver bullet whereby reframing, reminding, and comparing are key factors in solving all our behavioral qualms. Nevertheless, the explosion of nudge units across the world has been accompanied by an explosion of evidence highlighting the limits of relying on small changes in choice architecture to create large, long-lasting, and generally applicable change.

The Relative Effect of Nudges on Behavior

While individual nudges tend to be cost-effective (Benartzi et al., 2017), it is worth noting that their average effect on behavior can often be overestimated. A 2020 meta-analysis of nudge-based interventions found that the average nudge in the academic literature rendered a shift of only 8.7 percentage points. But even that is incredibly overstated, due to publication bias. Applying the same methods to analyze the pre-registered analysis of hundreds of studies run by a nudge unit that were not subject to publication bias, they found an average effect of a mere 1.4 percentage points.

That nudges have relatively small effects should in no way preclude their use: They can often be deployed at low cost and on a large scale, giving a high return on investment (but see De Ridder et al., 2020). Take, for example, Allcott and Rogers finding that, while energy-use social comparisons reduced energy consumption by less than 2%, it was so inexpensive to administer that it remains one of the most cost-effective strategies available for utilities to reduce demand (2014).

These cost-efficient and non-coercive nudges ought to be applauded for their meaningful effect on the low-hanging fruits of behavior change, but what about those cases where a 1.4% shift in behavior is simply not enough to achieve the *nudger's* goal? Considering that many nudges aim to address energy consumption, pro-environmental behaviors, or the provision of healthcare, such effects might prove insufficient (Hummel & Maedche, 2019); and while alternatives are often more costly, they can also be more effective. For example, a 2019 meta-analysis of 84 different behavior-change social marketing campaigns highlighted how, while notably more expensive per adoption than nudging, they are also more effective—shifting behaviors by an average of 18.1 percentage points (Green et al., 2019).

While nudges are often perceived as low-cost alternatives to more intensive strategies such as community-based social marketing, they nonetheless all fall under the larger umbrella of behavior change. As such, we see the bridging and layering of these techniques as a new frontier to achieve more effective and efficient large-scale shifts in behavior.

Maintaining Behavior Change in the Long Term

Another area of concern on the effectiveness of individual nudges has been how their impact holds up over time. The few studies that measure their long-run results find that the effects of nudges—whether repeated or not—tend to decay significantly over time (for examples, see Ferraro & Price, 2013; Damgaard et al., 2018; Hallsworth et al., 2016; Venema et al., 2018; and the review in Brandon et al., 2017).

This does not mean, however, that no nudges see their effects persist. Rather, it highlights how those that achieve continuous effects do so through recognizing a fundamental behavioral insight: Human

behavior is inherently social (Brandon et al., 2017). Despite much of applied behavioral science focusing on the individual, people naturally observe, internalize, and act according to the norms set by their peers. If a nudge results in people perceiving that a given behavior is widespread and/or is the acceptable social norm, its effects are more likely to be long-lasting, because they shift entire groups to new equilibria (Chudek & Henrich, 2011). Beyond the relatively limited toolkit of norms-messaging, then, practitioners can bolster their interventions by actively engaging with established social systems or by generating entirely new social norms (Mols et al., 2015; Van Der Linden, 2018).

People Are Diverse, and so Are Their Reactions to Nudges

A final critical criticism of the behavioral sciences' focus on nudging revolves around the reliance on one-size-fits-all interventions deployed homogeneously across heterogeneous populations.

Nudges deployed without a thorough understanding of the population and the diverse interests at play can reduce their effectiveness or—in a few cases—actually backfire for specific subpopulations (for reviews, see Osman et al., 2020; and Sunstein, 2017). Boomerang effects, for example, have been documented in a variety of cases (Bacon & Krpan, 2018; Byrne et al., 2018; Richter et al., 2018) where an intervention causes a segment to reverse, or move away, from the target behavior. People are different, and their reactions to nudges differ, too.

This standard buckshot approach can be contrasted with developing personalized or micro-targeted interventions that adapt or are selectively deployed to a subpopulation given their particular characteristics (Beshears et al., 2015; Gravert & Kurz, 2019; Metcalf et al., 2019a, 2019b). Alternatively, and as is the case with the L4L project featured here, practitioners can combine and stagger complementary strategies so that their effects ripple across population segments and ultimately snowball into something much bigger (Spencer, 2018).

Beyond Individual Nudges

While many view the above limitations as inherent to the behavioral sciences, they arise because of the historically narrow focus on choice architecture and nudging. When general practitioners, politicians, and members of the public think behavioral science, they think peer comparisons, reminders, and framing—techniques that i) tend only to marginally shift behavior, ii) often do not self-reinforce over time, and iii) treat all individuals the same—and so are left wholly unequipped to deal with complex problems.

Only so much change can be driven by "shooting at low-hanging fruit" with nudges (Hansen, 2018, p.195). But academics and practitioners agree that behavioral insights provide a much wider and richer toolkit than nudging alone (Ewert, 2020). In this article, we showcase the L4L program, which applies a sequential set of behavioral interventions to a challenge that has been seen as so wicked that it has been largely left unaddressed: Shifting small-scale producers away from an overreliance on agrochemical and towards a suite of more sustainable, less carbon-emitting practices.

Lands for Life: Layering Interventions to Maximize Change

In Colombia, 87% of farmers operate on less than two hectares of land. Together, they feed most of the country, and yet very few receive the support needed to help bridge the 30-50% yield gap between their production and that of their larger, industrial-scale counterparts. As best practices change, smallholder farmers are left in the dark, and so many continue to farm using the practices with which they are familiar, even though these have led (and continue to lead) to declining soil health, water pollution, and the progressive undermining of agricultural productivity, especially as the climate along the Andes changes.

Though this may seem like a particularly complex behavioral problem, getting farmers to adopt climate-friendly practices remains just that: A problem of behavior. However, it is also a problem that sole reliance on nudging—whether in the form of

framing, comparing, or reminding—would fail to address meaningfully. For one, the marginal effects of a nudge spread over thousands of farmsteads would have little impact at a landscape level. For positive environmental impacts to accrue in a given region, a meaningful and localized proportion of producers needs to adopt climate-friendly practices. Similarly, because farmers are familiar with intensive (rather than sustainable) production, any effort to change behavior will be met by a strong negative norm: Where a nudge may emphasize that 'less-is-more', their own experience says 'more-is-more'. Past efforts in the region have found this normative barrier particularly hard to overcome, resulting in lower and shorter adoption rates across the farming population. Lastly, even on a relatively localized landscape, farmers are a diverse group of people, in that they belong to different social groups, have different levels of education, and demonstrate different levels of resistance to change. Consequently, to achieve the levels of adoption needed to influence the environment meaningfully, Rare needed to design a behaviorally-informed program that i) adapted to farmers' differing needs and attitudes, ii) generated new, positive norms around sustainability in farming communities, and iii) succeeded in getting a *localized-but-ever-increasing* number of farmers to adopt climate-friendly practices. In short, we needed to fully rethink the conventional approach to agricultural behavior-change, doing so by leveraging the entire toolkit provided by the behavioral sciences.

Tackling Barriers to Adoption Through Behavioral Science

Rare's L4L program saw light in 2019 as a response to the failings of past behavior-change efforts that relied mainly on payment services and/or on education that encouraged shifts in behavior. Specifically, though many such programs had been successful at recruiting and training small cohorts of curious or innovative farmers, they had often failed—in the Colombian context—to expand their reach because of deeply-rooted community norms. To counter this issue, L4L builds on the success of other holistic behavior-change programs (e.g., Gillingham & Bollinger, 2017; McDonald et al., 2020; Pickering et al., 2019), slowly weaving individual behavioral interventions into a cohesive norm-change solution.

Aided by local technical assistants, our program focuses on the adoption of three climate-friendly behaviors: Fertilizing according to individual need, irrigating according to individual need, and enriching soil with nutrient-rich, carbon-storing compost—a short but impactful collection of practices that provide tangible benefits for farmers on an individual level (less fertilization costs, increased climatic resilience, etc.) as well as collectively (stabilization of the water supply, the return of pollinators, a reduction in pests and diseases, etc.). Nonetheless, where many would assume that the benefits of the practices speak for themselves, L4L rests on one overarching insight: 'When in doubt, farmers stick to what they know'—and in the case of sustainable farming, there is a lot of doubt.

For example, while incorporating compost into one's fertilization plan significantly counteracts soil depletion, many farmers remain unconvinced—and who can blame them? Agricultural production is financially precarious, which makes most farmers reluctant to experiment with methods with which they are unfamiliar. Additionally, because they live season-to-season, we find that farmers do not necessarily notice and associate the pattern of decline in their productivity to anything related to soil depletion (a direct effect of overfertilization, overirrigation, and a lack of compost). *Confirmation bias* is ubiquitous, whereby farmers tend to overlook information or experiences in favor of those that support their viewpoint; very often, in fact, they simply blame climate change for their woes. There is little trust in information coming from outside their communities—a legacy of Colombia's 40-year internal conflict, not to mention a legacy of what feels like many broken promises from past NGO activities that culminated in no real change for farmers. Combining these factors with our human tendency to avoid uncertainty, we can see why Colombian farmers prefer to stick with the devil they know, but where risk aversion is usually to blame, here the situation is steeped in ambiguity. This distinction is important, because while humans tend to both be *risk- and ambiguity-averse*, the type of

uncertainty one faces changes how decisions can be swayed. While people are generally risk-averse when thinking about outcomes in terms of gains, for instance, framing choices in terms of potential losses leads most of us to become risk-seeking. This is where a simple nudge might be particularly effective. Unfortunately, when tackling ambiguity, practitioners' options are more limited: Farmers prefer certainty over risk and risk over ambiguity, and the more ambiguity-averse a farmer is, the more resistant they are to trying and adopting new practices (e.g., Crentsil et al., 2020; Ross et al., 2012; Warnick et al., 2011).

Our analysis revealed that—as for many of us—farmers' production decisions relied on their experience with various techniques to gauge their reliability. In other words, outcomes that farmers have themselves experienced feel more tangible, less ambiguous. Another important factor is what they see others around them doing. This is why norms are so powerful, in that people tend to follow the behaviors they see others engaging in; they also tend to rely on the decisions of others when unsure about what to do (Venema et al., 2020). If everyone is doing one thing, the reasonable assumption is that it works. Thus, when presented with new, sustainable production techniques, farmers need only look around to feel confident in their decision not to adopt them. On the flip side, the more people they see shifting their practices, the more likely they will be to follow suit. Farmers will also more likely adopt new practices if there is a sense that others in their community expect them to do so.

Layering Evidence to Alleviate Biases

No single intervention can provide enough confidence in the practices for all farmers to adopt. The people L4L works with are varied, and so is the degree to which they rely on social norms and personal experience to make sense of their choices. Some farmers demonstrate little aversion towards ambiguous outcomes; others are more apprehensive. L4L was designed with this in mind, to meet farmers wherever they fall on the 'resistance-to-ambiguity' axis: Some farmers will demonstrate little (**L**ow-**R**esistance **F**armers, LRFs), some will be moderately resistant (**M**id-**R**esistance **F**armers, MRFs), and some will resist anything that is remotely ambiguous to them (High-Resistance Farmers, HRFs). But rather than defining quantitative farmer groups in advance, it is the time at which they interact with the program—essentially the mechanism by which we induce behavioral shifts—that informs how best to target them.

Farmers that fall along the lower end of the resistance-to-ambiguity axis, for example, are likely to require but minimal exposure to a new, more cost-effective practice before wanting to adopt it. LRFs, then, are exemplified by those producers that come forth and engage with open-recruitment NGO programs. For them, L4L needs to ensure that adoption is made simple and easy to maintain, thereby alleviating any ambiguity about the practices with *timely reminders* and *personalized advice*, and encouraging *record-keeping*, to make their benefits more tangible.

MRFs, on the other hand, are those farmers that require more convincing, in that while they recognize that the new practices *may* be better, it is seeing others around them succeed that encourages them to participate. Consequently, this group is particularly influenced by what they see around them (by the *descriptive norm* in their community) and by the social proof of success that their peers provide. Farmers are more likely to adopt a new behavior if they know that other farmers also have (Cole & Fernando, 2016; Genius et al., 2014; Kuhfuss et al., 2016; Vu et al., 2020) and recommend the behavior (Fafchamps et al., 2020; Villamayor-Tomas et al., 2019). Using these levers once early social proof has been established should maximize MRF adoption.

Finally, for some farmers, more evidence just does not suffice. They are so averse to ambiguity (or change) that the benefits of adopting new practices—to them—do not outweigh the costs. Supplemental gains or losses are needed to sway behavior, either by pairing the novel practices with additional benefits or by imposing a cost to maintaining previous ones. However, these incentives need not be material. With sufficient support from the rest of the community, injunctive norms can drive social sanctions sufficient to support compliance. In this way, the normative expectations of the rest of the

community, thinking that they should be adopting the novel practices because this is what is best for the community, can shift the balance and sway these most resistant farmers (Bicchieri, 2016).

Bringing Theory With Practice: The Blueprint

The above theoretical framework is what guides and allows *L4L* to go beyond a one-size-fits-all strategy, and to ultimately leverage farmers' differences in a way that reinforces—rather than impedes—the effectiveness of the program. The result is a three-phased effort where each phase delivers its own set of nudges, social marketing, and community-building activities to slowly build community confidence. First, invest heavily in an early cohort of *innovadores* (farmer innovators), second, leverage the social proof they provide the community to set a change of norm in motion, and finally third, leverage the ever-growing number of i*nnovadores* and their families to reinforce that the community now expects farmers to farm sustainably (see Figure 1). The farmer segments described in the previous section are thus more mechanistic than descriptive in nature, with L4L participants self-segmenting based on their confidence in the practices—or lack thereof.

- **Phase 0: Generates tangible evidence of adoption ease and relevant, local success.** L4L offers individualized training to LRFs that approach the program and provides them with timely, practice-specific reminders over a two-way SMS platform, to ease and reinforce the adoption of our three practices. Each *innovador* also receives an agroclimatic station—a marker placed on their plot that publicly signals their participation in the program. At the end of their training, the graduating *innovadores* are celebrated in a public recognition event in which they receive accolades from a prestigious member of their community (a mayor, a priest, a local celebrity, etc.).
- **Phase 1: Publicly showcases the increasing number of farmers that are adopting and benefiting from sustainable practices.** Following the public recognition event, L4L launches a social marketing campaign designed to highlight the successes of farmers who have adopted sustainable farming practices in the community. Here, the target is MRFs, whereby anyone convinced by the ongoing campaign can join the program to i) receive training on how to build an agroclimatic station, in order to signal their commitment, ii) attend peer-led workshops and centralized technical assistance clinics, and iii) gain access to our two-way SMS platform. Throughout this process, L4L monitors the perception farmers have about the prevalence of sustainable practices in their community (i.e., the descriptive norm).
- **Phase 2: Generates a community-wide understanding that everyone (but particularly farmers) benefits from all farmers farming sustainably.** Once ongoing monitoring reveals a significant shift in the community's descriptive norm, the program moves into its final phase. Social marketing now revolves around highlighting the collective benefits of widespread adoption and how a growing proportion of the community *expect you to be farming sustainably, too.* Community events (traditional plays, songs, school activities) highlight the positive externalities of farming sustainably and continue to reinforce the good work of LRFs and MRFs. Those HRFs who do not make the shift will eventually have to contend with reputational losses. This is also where L4L exits the community, once proof has turned to pressure, and the new status quo reaches a point of self-enforcing equilibrium.

Conclusion

The chorus is growing in calls for the behavioral sciences to answer to more than the "low-hanging-fruits" of the initial nudge revolution (Nesterak, 2020; Sanders et al., 2018; Spencer, 2018; Van Der Linden, 2018). Addressing these complex and wicked problems requires tackling the many shortcomings of traditional nudges, including their relatively small effects, their lack of persistence, as well as their often one-size-fits-all approach. L4L meets this challenge by joining a handful of holistic behavior change programs that move beyond the field's narrow focus on singular nudges, to achieve behavior change using a holistic evidence-based

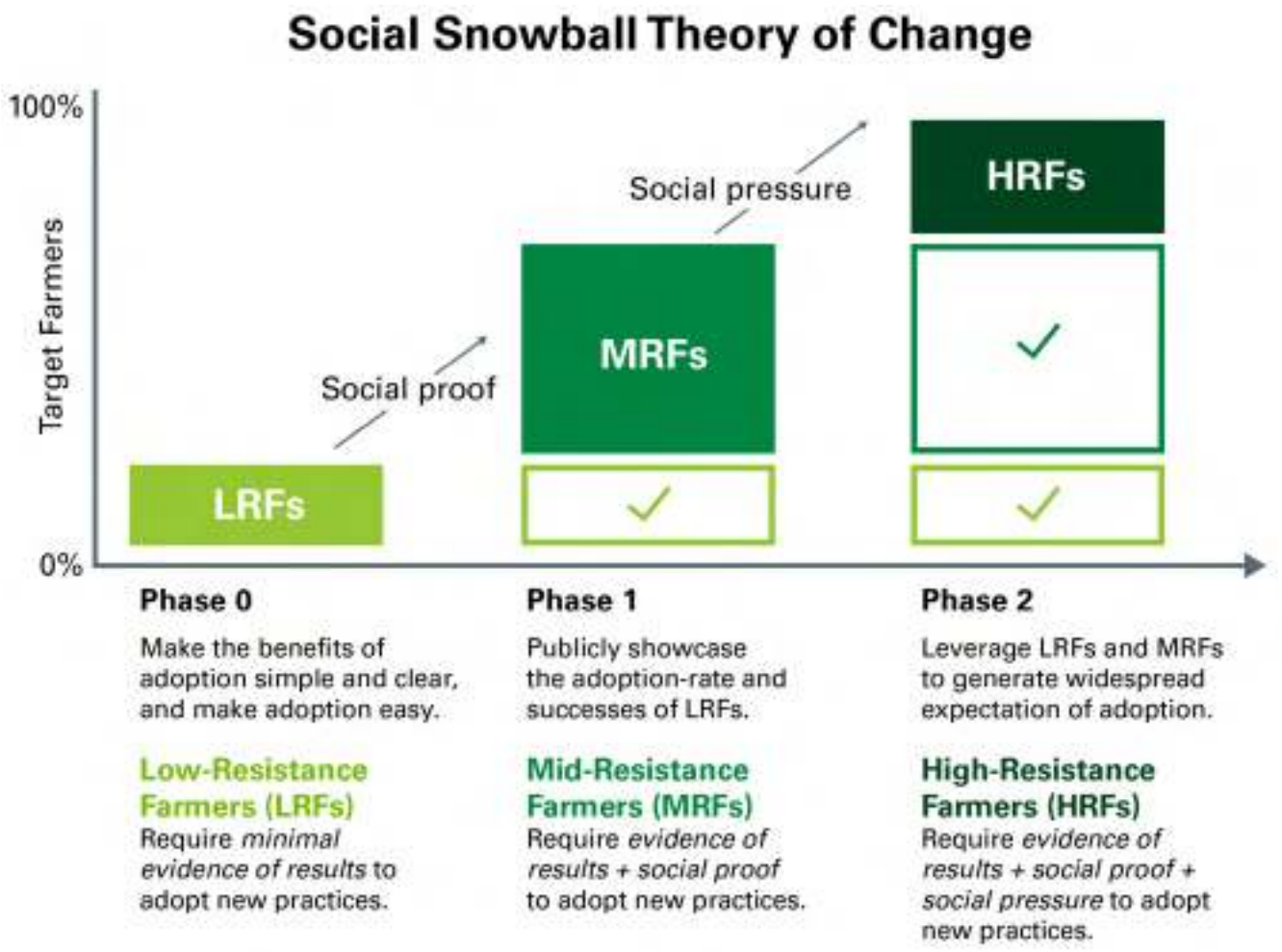

Figure 1: The L4L program blueprint. Taking a multi-layered, three-phased approach to encouraging sustainable farming practices, L4L reaches farmers when they are most likely to make the shift. Its three phases each target different farmer subgroups, but each phase builds on the one preceding it—taking advantage of successive behavior change outcomes to achieve an impact greater than the sum of its parts. Put simply, phase 0 makes climate-smart agriculture easy, phase 1 makes it observable, and phase 2 makes it expected.

approach (e.g., Gillingham & Bollinger, 2017; Pickering et al., 2019).

To have a meaningful environmental impact—in most cases—it is simply not enough to shift behavior a mere couple of percentage points spread out across the population. Rather, program designers and policymakers have aimed to engender widespread collective action, a call that the behavioral sciences need to answer. To drive collective action, we need a collection of behavior-change interventions. We need strategies that are up to the task of shifting social systems as a whole and that drive community-wide change.

Rather than the silver bullet that nudges are often sold as being, practitioners would do well to remember that nudges are only *part* of a wider toolkit of behavior-change levers that the behavioral sciences offer. As this case study shows, the toolkit that the behavioral sciences have made available is much wider than nudges and choice architecture. All we need now is a bit more creativity in how we apply the more intensive, multi-staged, and fine-tuned tools to ensure larger, long-lasting, and far-reaching outcomes for our behavior-change programs.

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Gamification in Behavioral Science: An Engaging Prospect for Online Research

Joshua Henk Balsters and Jo Evershed*

Gorilla Experiment Builder

The Covid-19 pandemic has forced most behavioral science researchers to transition from in-person and lab-based testing to online research. The sudden explosion in the quantity of online research studies has inevitably affected both participant recruitment and engagement. In this increasingly crowded market space, how can researchers maximize data quality and recruitment? In the last decade, gamification has been increasingly employed as a tool to promote recruitment, engagement, and learning in a range of fields (i.e., marketing, education, health and productivity tools, and fundamental research). Here, we review the concept of gamification in behavioral science research, outline some of the different ways it is used, and discuss examples where gamification has been employed to great effect in online research.

What Is Gamification?

The gamification trend is believed to have started around 2010; however, the concept of embedding tasks within a game to increase learning and motivation has been around for hundreds of years (Zichermann & Cunningham, 2011). A game is a system in which players engage in a fictional challenge, defined by rules, interactivity, and feedback, which results in a quantifiable outcome often provoking an emotional reaction (Kankanhalli et al., 2012). Given this definition, we can define gamification as the use of these game elements and techniques in non-game contexts (Deterding et al., 2011; Kankanhalli et al., 2012).

A Taxonomy of Gamification

There are many potential ways to gamify a behavioral science task, each of which elicits differing levels of motivation and requires different levels of input from the experimenter. In order to help researchers decide which game elements are more appropriate in a particular context, Toda et al. (2019) eloquently summarize the different approaches to gamification, using a clear taxonomy of different game elements (e.g., points, badges, leader boards, etc.). The authors also suggest a distinction between extrinsic and intrinsic game elements. An extrinsic game element can be perceived clearly and objectively by the user, whereas an intrinsic element is presented more subtly so that the user is unaware of perceiving it (Toda et al., 2019).

In their taxonomy, Toda et al. (2019) described 21 game elements and their synonyms. These elements were validated by two surveys with experts in the field of gamification in education. This resulted in a taxonomy of five gamification dimensions: Performance/measurement, Social, Ecological, Personal, and Fictional (see Figure 1). Whilst this taxonomy is highly useful for anyone wishing to develop a gamified task, it is worth remembering that the taxonomy proposed by Toda et al. (2019) was based solely on expert opinion, not on actual users.

Performance/measurement

Performance/measurement elements are the most commonly used in gamification. They include rewarding performance by using points, levels, and achievements/badges. There are hundreds of examples where performance measurements have been used to turn different tasks into games, such as Datacamp (gamifying computer programming

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education), Habitica (gamifying habit forming), and Peloton (gamifying fitness), to name but a few. All of these examples use extrinsic features to motivate participants and provide feedback.

Social

Another common feature in gamification is to compare learning and performance with other users, i.e., the social dimension. The most common way to do this is through leader boards, either making users work hard to catch up with friends or work hard to stay on top and maintain their reputation. Depending on the tasks, there are plenty of opportunities for social interaction either via competition or cooperation. Towards the end of this article, we will describe the HIVE,[1] a fun and powerful game for exploring conformity and diversity across multiple individuals.

Ecological

The ecological dimension relates to the environment implemented in gamification. This dimension includes elements such as chance (manipulating the probability of winning or the size of the prize), time pressure, or rarity of prizes (e.g., availability certain Pokémon). Decades of research in the fields of neuroeconomics and value-based decision-making have provided robust neurocomputational models that describe these behaviors (Rangel et al., 2008). Crucially, the emerging field of computational

Figure 1: The taxonomy of gamification proposed by Toda et al. (2019). Image from Toda et al. (2019).

psychiatry is linking these mechanisms to psychological and psychiatric phenotypes (Montague et al., 2012). Therefore, gamification could become a useful tool for clinical diagnostics and treatment. In the case studies section, we will discuss FunMaths,[2] which has used gamification to help children that struggle with arithmetic and understanding number relations.

[1] https://gorilla.sc/the-hive/.

[2] https://gorilla.sc/funmaths/.

Personal

The personal dimension is related to the user of the environment; for example, is the game repetitive, or does it stay fresh and novel? Is it simple, or do the tasks challenge the user? Are there pleasing sensations for the user, such as vibrant colors or sounds, to improve their experience? These elements are implicitly rewarding to the user.

Fictional

Lastly, the fictional dimension aims to link the user experience with context through narrative and storytelling elements. In these games, the user is unaware they are learning a skill or performing a task. A number of educational board games have been developed over the years, using the fictional dimension (for example playing CBT), and more recently, apps are being developed to extract behaviors through naturalistic game play (Sea Quest Hero) and even treat behavioral conditions like ADHD (Neuroracer). We will later discuss Treasure Collector,[3] a game for children that takes a basic psychological paradigm and turns it into an exciting adventure!

Does Gamification Improve Behavioral Science?

In normal settings, experimental tasks and questionnaires may be tedious for participants. They often use simplistic stimuli, are repetitive, and provide no feedback on personal performance or the performance of others (scoring poorly on four of the five gamification dimensions mentioned above). In any experiment or survey, participants' attention gets lower over time, thereby increasing the error rate. This is amplified in remote and online testing, where there are likely to be any number of distractions that are not present in the lab. When the experimenter is not present, participants are more likely to drop out if they become bored—increasingly so when experiments require more than one session (Palan & Schitter, 2018). It has been suggested that engaging and rewarding participants through gamification can help solve these problems and therefore increase data quality by increasing attention and motivation.

Bailey et al. (2015) investigated the impact of gamification on survey responses. Here, the authors refer to 'soft gamification', where traditional survey responses were replaced with more interesting tools like dragging and selecting images. We consider this an increase in the personal dimension in Toda et al.'s (2019) taxonomy. Bailey et al. (2015) found that gamification led to richer responses (a significant increase in the numbers of words used in responding) and participants were engaged for longer. This is just one of many examples that show the benefits of gamifying research.

Looysten et al. (2017) conducted a systematic review of online studies, employing gamification to investigate the effects of game-based environments on online research. To do so, they looked at different measures of engagement, e.g., the amount of time spent on the program and numbers of visits. Taken together, their results suggest that gamification increases engagement in online programs and enhances other outcomes, such as learning and health behavior. However, the authors also suggest that the impact of gamification features reduces over time as the novelty of points, levelling up, and badges wears off. Looyestyn et al. (2017) cite the example of the gamified app Four-square, which was hugely successful upon release but failed to retain users after 6-12 months. I am sure we can all think of other examples of websites and apps that were hugely popular at first but failed to retain customers. This suggests that only utilizing performance/measurement elements in gamification will lead to initial spikes but fail to retain customers/participants. This may not be a problem for most behavioral science experiments where long-term retention is not required; however, we suggest it is worth considering when developing longitudinal/multi-session games.

The systematic review by Looyestyn et al. (2017) provides the strongest evidence to date that gamification significantly increases participant engagement. However, it is also worth highlighting some limitations. First, the positive effect of gamification

[2] https://gorilla.sc/treasure-collector/.

was not found for all measures of engagement, which sheds some doubt on the generalizability of these results. Second, although they began with 1,017 online studies, only 15 studies remained for analysis after the exclusion criteria were applied. This small sample size, and large heterogeneity in terms of population, methods, and outcomes, meant these studies were not directly comparable, and thus it was not possible to conduct a meta-analysis. To overcome this limitation, future research should provide more standardized testing, measures, and analysis methods in online research. There is some promising work in this direction. In a recent study, Chierchia et al. (2019) provided a battery of novel ability tests to investigate non-verbal abstract reasoning. The battery was validated on adolescents and adults who performed matrix reasoning by identifying relationships between shapes. While non-verbal ability tests are usually protected by copyright, Chierchia et al. (2019) made their battery open access[4] for academic research.

Gamification Case Studies

Games That Improve Learning: Funmaths Gamifies Arithmetic Skills for Children

Dyscalculia is a developmental condition that affects the ability to acquire arithmetical skills, i.e., dyslexia for numbers. Individuals with dyscalculia lack an intuitive grasp of numbers and their relations. Reports suggest that around 5-7% of children may have developmental dyscalculia (similar prevalence to developmental dyslexia), and it is estimated that low numeracy skills cost the UK £2.4billion annually (Butterworth et al., 2011). Butterworth et al. (2011) further propose that bringing the lowest 19.4% of Americans to the minimum level of numeracy would lead to a 0.74% increase in GDP growth. There are clear economic and social benefits to improving arithmetical skills in the general population. Professor Diana Laurillard (Professor of Learning with Digital Technologies at UCL Institute of Education) developed a series of math games to train math skills in dyscalculic children through simple manipulations of objects.

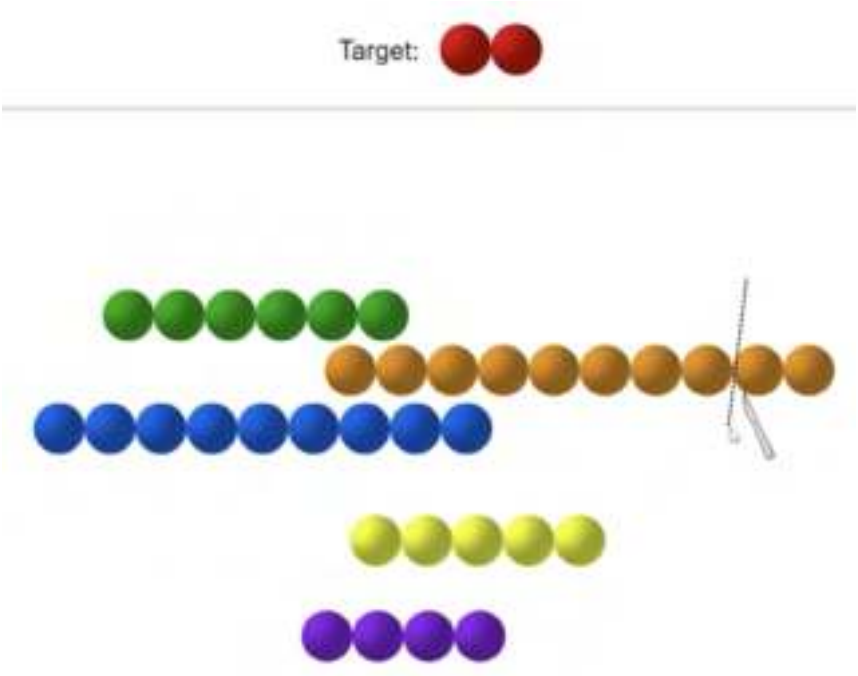

Figure 2: NumberBeads: Use a knife to split beads to match the target.

In one of the games (NumberBeads), children learn about addition, subtraction, and the number line by combining and segmenting strings of beads. Figure

[3] https://app.gorilla.sc/openmaterials/36164.

2 shows an example where the target is a chain of two beads. In this instance, a knife is being used to slice the larger chain of beads into chains of two beads. Participants can combine and cut these up as they wish, and when this is done correctly the chain disappears in a pleasing puff of success! The game continually adapts to the player's ability, building up their knowledge of the number line, fluency of the number line, and understanding of numerals (utilizing performance and personal gamification

ally constructing the game themselves." She also suggests that similar games could be developed to train language skills in people with dyslexia.[5]

Games such as these provide a high-quality educational resource at a very low cost. According to Prof. Laurillard, these games have tremendous value, because they provide individualised and enjoyable mathematics tuition to students both with and without dyscalculia. One player said, "I'd play

Figure 3: Treasure Collector: Executive function training tasks for children.

it all day," while a teacher said "I was absolutely astounded by the work they were doing with this. They were clearly seeing things in a different way." Students clearly enjoy playing these games, which continually stretch and extend them (personal dimension of gamification taxonomy).

[4] You can read the full interview here: https://gorilla.sc/gamified-research-series-constructionist-gaming/.

Games to Increase Motivation: Treasure Collector Gamifies Executive Function Training in Children

We previously mentioned the challenges of attrition for online longitudinal research (Palan & Schitter, 2018). Professor Nikolaus Steinbeis, based at UCL, wanted children (7-10yrs) to train 10 minutes a day for 8 weeks, in order to improve executive function. Such a task would have been impossible without gamification.

Children would be training on the Go/No-Go task, which tests attention and response inhibition by asking participants to respond to certain stimuli as fast as possible (Go trials) versus withholding a response to other stimuli (No-Go trials).[6] To keep participants engaged, the classic Go/No-Go task was embedded into a larger narrative of being an explorer (an example of the fictional dimension of gamification). Figure 3 shows how participants chose their own avatar, which was integrated into the story. The Go/No-Go task was then reskinned in a variety of situations, including when to dig for treasure, or when to steal gold from a dragon (Figure 3), or when to drive straight or swerve to avoid ice on the road. The narrative elements and varied game play increased compliance and helped deliver quality adaptive training for the research project.

According to Prof Bishop, while you can typically get an adult to do around 100 trials of a boring adaptive task, with kids, after three or four trials, they'll say, "Is there much more of this?".[7] This is bad news if you want them to train every day for 8 weeks! And yet, with the Treasure Collector Games, Prof Steinbeis had students train for 10 minutes on the game, four times a week for 8 weeks. Overall, participants completed around 4,000 trials in total—and reported that they still enjoyed the game. It is clear that without gamification, this study would have been impossible, and so by employing gamification, a range of developmental research questions become possible.

Games That Answer New Research Questions – the Hive and Multiplayer Games

The Hive[8] is a research platform for studying how people think, feel, and behave together in groups (Bazazi et al., 2019; Neville et al., 2020). It works as an app that people can access with their smartphone. After logging in, the Hive environment displays a dot that can be dragged around. The coordinate of each dot is recorded, thus allowing experimenters

Figure 4: Schematic of an experiment set up and minimal group assignment. Image from Neville et al. (2020).

to analyze trajectories and rest periods in a similar way to experiments utilizing eye or mouse tracking. Each participant sees their own dot, and other participants', moving on the central display. Then, they perform different tasks while monitoring other individuals' decisions, represented by the movements of the other dots (see Figure 4).

[5] See an example here: https://research.sc/participant/login/dynamic/907B0C84-A7AD-4E1C-8F32-093AEFB03039.

[6] http://cauldron.sc/clients#hive, developed with Professor Daniel Richardson at UCL.

[7] see https://gorilla.sc/gamified-research-series-investigating-language-development/.

One of the studies involving the Hive investigates the link between mimicry and self-categorization, and it attempts to answer the following question: Do we always do what others do and, if not, what are the factors that influence our decisions in a group? (Neville et al., 2020). The experiment has been conducted at multiple public events such as the Science Museum in London with groups between four and 12 people. Participants are assigned to two groups i.e., the red and the blue dot. Then, they play a series of games involving moving their dots and looking at the choices of the other participants (belonging to both their own group and to the other one). Overall, the results show that participants are influenced by the movements of the confederate dots that are the same colors as their own. The authors conclude that mimicry is affected by in-group/out-group knowledge, i.e., knowledge of whether people belong to the same category as us. The Hive project allows one to study a fundamental question, namely: Do people take decisions differently when they think as individuals or as a crowd? Instead of paying participants for performing a long and boring experiment in a lab, the Hive allows researchers to investigate this issue everywhere, using people's smartphones, and without any additional costs whilst maintaining the precision of lab-based testing.

Will Gamification Influence My Findings?

Our literature review suggests that gamification is effective at increasing participant engagement and retention, and even increasing data quality in both qualitative and quantitative experiments. However, Bailey et al. (2015) reported a concern that applying gaming mechanics to questions can change the character of the answers and lead to qualitatively different responses. Therefore, to what extent does gamification change behavior?

A common concern for researchers is whether gamification will fundamentally change the outcomes of task behavior or surveys being administered. Will gamifying my research mean the findings are no longer valid? We can boil these questions down to 'do external rewards and motivators change behavior?' The answer to this final question is certainly 'yes'.

A fascinating series of studies by Manohar et al. (2015) investigated the effect of extrinsic reward on the speed-accuracy trade-off, which is supposed to be a fundamental law—as we move faster, we become less accurate. However, monetary incentives break this law, and participants became both faster AND more accurate. This is just one of many examples showing that extrinsic reinforcers change behavior. That said, external reinforcers are often present in traditional lab-based behavioral economics studies. Total score bars are commonplace in value-based decision-making studies, yet researchers in the field still argue about the extent to which this biases behavior in line with assumptions of prospect theory (Kahneman & Tversky, 1979).

Ryan and Deci (2000) distinguish between two different forms of motivation: Intrinsic and extrinsic. Intrinsic motivation relates to the individual's satisfaction in performing an activity in and of itself, while extrinsic motivation occurs when the activity is performed to obtain another and tangible outcome, e.g., money as a reward. This dichotomy is mirrored by the implicit/explicit dimensions of gamification noted in Toda et al.'s (2019) taxonomy. It is therefore likely that employing implicit vs explicit dimensions of gamification will affect intrinsic or extrinsic motivation in unique ways.

Mekler et al. (2017) investigated the effects of individual game elements on intrinsic and extrinsic motivation in an image annotation task. Mekler et al. (2017) found that gamification significantly improved extrinsic factors like performance, especially when using leader boards and points, but not intrinsic motivation or competence (the perceived extent of one's own actions as the cause of desired consequences in one's environment). This point was also raised by Looyestyn et al. (2017), who noted that the positive effects of gamification seemed to lessen over time: The performance/measurement dimension of gamification is only effective in the short run. Looyestyn et al. (2017) suggest that in order to be successful in the long term, gamified applications should focus on intrinsic, instead of extrinsic, motivation, i.e., focus on the personal and fictional dimensions of gamification. For future applications, it is crucial to design game environments that enhance users' intrinsic motivation to

keep them engaged over time, potentially moving more towards games instead of gamification (see below).

Lastly, we wish to suggest the possibility that differences between traditional tasks and games may not be such a bad thing for gamified research. In these situations, we mostly consider lab-based testing to be the 'ground-truth' in psychology and behavioral science. However, lab conditions and tasks can actually be quite artificial. Psychological tasks are often reduced to their most basic elements so that scientists can make accurate inferences about the factors that influence behavior. However, it is often the case that lab-based findings are not effective at predicting behaviors outside the lab (Kingstone et al., 2008; Shamay-Tsoory & Mendelsohn, 2019). Therefore, even if you do find different results between paradigms run in the lab and gamified versions of tasks, that does not mean that your game-based findings are inherently wrong or less valid. We do not yet know which of these is closer to the 'ground truth'. It may be that games, which are often more natural and more intrinsically motivating, are in fact more relevant to real-world decision-making.

Gamification vs Games in Research

There is a subtle, but important, distinction to be made between using gamification and games in research. Whilst gamification refers to adding game elements to existing tasks, it is also possible to create research games instead of gamifying existing research paradigms. Research games will be intrinsically motivating (and thus, hopefully, maintain engagement over time) and allow for the exploration of more naturalistic behaviors.

Typically, the objective of gamification is to increase motivation and engagement. This is often achieved by using extrinsic motivators such as points, badges, and leader boards (i.e., the performance/measurement dimension), but what is the point of points? We can imagine gamifying reading by stating that each page is a point, thus motivating someone to read more each day, as it is worth more points. Helpfully, books already have points printed on each page (the page numbers) so you have a running total score, but that's probably not what motives any of us to read. This approach to gamification ignores the fact that the book itself is intrinsically motivating, or to put it another way, a good book doesn't need gamifying. The objective of a game is pleasure or to learn a new skill, and therefore the motivation to play it is often intrinsic (i.e., the personal and fictional dimensions). This intrinsic/extrinsic distinction in motivation changes the way behaviors are learned and reinforced.

Most research tasks are designed to test a very specific question, and as such they will only have a limited number of response options that can easily be categorized as correct or incorrect. However, games typically have a larger range of responses, which can lead to improvisation. They also offer the player the opportunity to explore a world, and learning is often implicit and directed by the player rather than by the experimenter. Compared to gamification, games often employ a more constructionist approach that leads to discovery learning. The FunMaths game is one such example, as participants can achieve their goals in several different ways and are given the opportunity to explore different options. This is different to Treasure Collector, which uses game elements such as a story narrative to increase motivation and engagement for a single, simple task (Go/No-Go task). Thus, one can argue that Treasure Collector is an example of gamification of the Go/No-Go task, whereas FunMaths is an educational game designed to improve learning. However, when gamification is done well, it should be near impossible to distinguish it from a game.

When using games to investigate naturalistic behaviors, researchers must contend with a wider array of behaviors—statistically, we could refer to this as a larger parameter space. Each decision is not made in isolation, and choices are likely to interact with one another, creating large, multi-factorial designs. Rich datasets like this are perfect for machine learning algorithms, which can help identify which combinations of behaviors best predict outcomes. However, generating meaningful inferences from potentially enormous matrices of behavior combinations requires an even larger number of datapoints, i.e., lots of participants. With traditional lab-based or online testing this would increase

participant costs hugely. However, we have already highlighted that games can be intrinsically motivating and genuinely enjoyable, thus significantly reducing participants' fees (maybe even removing them all together). For each experiment, there will be a breakeven point where, if you want more than a certain number of participants, it becomes cheaper to invest in developing an exciting game compared to using traditional behavioral science paradigms and paying participants for their time. In the case of Sea Hero Quest (www.seaheroquest.com), they are reported to have recorded data from 4.3 million players, who have played for a total of over 117 years. Collecting 117 years' worth of data via a recruitment service such as Prolific (117 participants, 525,600 minutes each at £7.50 per hour) would cost over £10.7 million. As tools for making games become cheaper and more accessible, and the need for larger samples gets stronger (i.e., reproducibility), games are going to be an important aspect of scaling up experimental, social, behavioral, and economic research.

Conclusions

Herein, we have reviewed the role of gamification in behavioral science. We have endeavored to define gamification and outline the different elements that can be considered when creating behavioral science games. We have also provided examples of three different behavioral science games.[9] We propose that gamification will increase engagement and retention in online behavioral science studies. However, one must consider whether this will in some way affect the data being collected. Anecdotal evidence from researchers and participants suggests that the benefits of employing gamification and game-based learning far outweigh these concerns.

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No Contract, No Problem: The Value of Flexibility in the Subscription Economy

Benny Cheung, Abbie Letherby and Alice Pearce*

Dectech

Across the world, companies are adopting the subscription model to increase sales and create more predictable revenue streams. Given this rise in popularity, we conducted an experiment with a sample size of around 1,400 UK citizens, to investigate subscription services. Our aim was to explore how brands can better acquire and retain subscription customers. We looked at three subscription types (Content, Service, Product) across six different industries (Food, Delivery, Health & Beauty, Music, Fitness, TV & Film) and measured their current appeal and avenues for improvement. Our results highlight key acquisition drivers, including free trials, discount periods and bundles, the success of which is founded in understanding consumer behavioural biases. We also explore the impact of different benefits on churn and how to improve retention. The research was conducted prior to the pandemic, so while base levels will have been affected by lockdowns, the insights are still applicable.

Introduction

The subscriptions model is being adopted by brands across the world. Netflix and Amazon have shown how lucrative Content and Service subscriptions can be, and Hello Fresh is a prime example of the increasingly prominent brands looking to shake up the product market.

Traditional businesses are also pivoting towards subscriptions, uprooting their previously successful business models. In 2010, for instance, Microsoft unveiled its Office 365 package, offering monthly or annual payments. This represents an extraordinary step change from its one-time licence model, which has operated since 1990. Furthermore, the decision appears to have been vindicated, as Office 365 grew 27% year-on-year in Q4 2019 (Wilhelm, 2020).

Behavioural science would suggest that the flexibility for risk-averse customers to cancel their subscription at any time has helped with customer acquisition, but can it help retention, too?

Elsewhere, Netflix's decision to end its offer of free trials may spark a trend in the subscription industry. Presumably, Netflix has found that free trials reduce customer lifetime value. This report looks at free trials and whether alternative tactics, like initial price discounting, are more valuable.

The subscription model is not right for every business. Research (Dodds, 2019) finds venture capital deals for physical subscription boxes fell by more than half between 2015 and 2018. So why are direct-to-consumer (D2C) product subscriptions not enjoying the success many predicted? We explore possible reasons and look at the more successful Content and Service offerings, to unpick what distinguishes the varying degrees of success of each of the three main subscription types.

Chapter One: Market Landscape

Talk of a "subscription economy" is not overblown. More than four in five UK adults hold at least one type of subscription. But the youngest kind – Product – is struggling to prosper.

Having surveyed the subscription landscape, we classified subscriptions into three distinct types: Content, Service and Product (Table 1).

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Subscription Type	Definition	Example Industry	Example Providers
Product	Provides customers with a physical product(s), usually delivered to their door at regular intervals	Food	Hello Fresh Mindful Chef
		Health & Beauty	BirchBox BeautyPie
Service	Provides customers with unlimited use of a specific service for the duration for which they pay	Delivery	Amazon Prime Tesco Delivery
		Fitness	PureGym Fitness First
Content	Provides customer with unlimited access to premium online content for the duration for which they pay	TV & Film	Netflix Amazon Prime Video
		Music	Spotify Apple Music

Table 1: Definition of subscription types and example providers.

The Subscription Market Landscape

Sizing the market clearly shows that the subscription hype is well substantiated. Our research finds 83% of UK adults hold at least one type of subscription, the most prevalent of which are Service and Content subscriptions (Figure 1).

The most popular combination of subscription types is Service and Content, held by almost 17m consumers (32%). Meanwhile, one in five UK adults hold at least one of each type of subscription. Together, these two combinations are held by more than half (52%) of the population.

Overall, Product subscriptions (13.6m) are not as widespread as Content (30.4m) or Service (36.7m), which is partly because Product subscriptions are a comparatively newer offering.

Products Performing Poorly

Looking at the percentage of UK adults who sign up to a subscription over 12 months – known as "acquisition growth" – is a useful lens through which to assess the subscription landscape. When looking at the acquisition growth of six different industries within the three subscription types, our most striking finding is the low acquisition volume of Product subscriptions. The 1% growth in health & beauty and food recipe box subscriptions is half that of Content and Service types.

This runs counter to expectations, since a younger industry will typically grow at a faster rate. We posit that one of the reasons why D2C propositions are not experiencing strong acquisition growth is due to a lack of intrinsic demand. For instance, brands that offer grooming goods, which can be bought at a range of other outlets, do not offer anything unique.

Another reason is simply the frequency of D2C deliveries. Customers with Product subscriptions typically receive their goods once a month, which tends to coincide with the payment cycle. Regular deliveries may prompt customers to review their subscription and ultimately cut their expenditure, particularly if the frequency is too great and customers don't require another delivery within that time frame. Depending on the value to customers, this might trigger them to unsubscribe.

Furthermore, for D2C subscriptions, consumer guilt around paying for goods that they do not use is a problem. Whether motivated by environmental concerns or financial burden, it tends to result in higher churn. Finally, there is a distinct lack of

choice when it comes to goods available via D2C subscriptions. As a nascent industry, this is not surprising, but it is hampering potential acquisition growth.

No Contract, No Problem

Remarkably, almost half (47%) of the UK adult population has a TV & film subscription. One instrumental factor behind the popularity of these subscriptions is that they usually offer a fixed contract, thereby improving retention rates. However, our research indicates that disrupter brands like Netflix and Amazon Video, which offer rolling contracts, contribute disproportionally to the success of Content and Service subscriptions (see Chapters Three and Five).

Whilst there is not much difference between acquisition rates across the six industries, we think it is telling that delivery service subscriptions have the highest acquisition growth (3%), when the market leader, Amazon Prime, offers a rolling contract. As of October 2018, 26% of UK adults were estimated to be Amazon Prime members (Mintel Press Team, 2019), which is an increase of roughly 10 percentage points since 2017 (Annicelli, 2017).[1] We expect in addition to Prime's fast delivery and unrivalled product offering, the no-contract subscription is attracting new customers.

Chapter Two: Acquisition Drivers

Subscription perks are now commonplace. Graze, the snack box company, is well known for its free box offer. Referral and loyalty gifts are also tried and tested techniques to entice new customers. We suggest several other ways that brands can improve their acquisition rate.

Our randomised controlled trial (RCT) experiment tested some of the most common benefits that brands offer potential customers, including initial discounting, loyalty points and the ability to pause

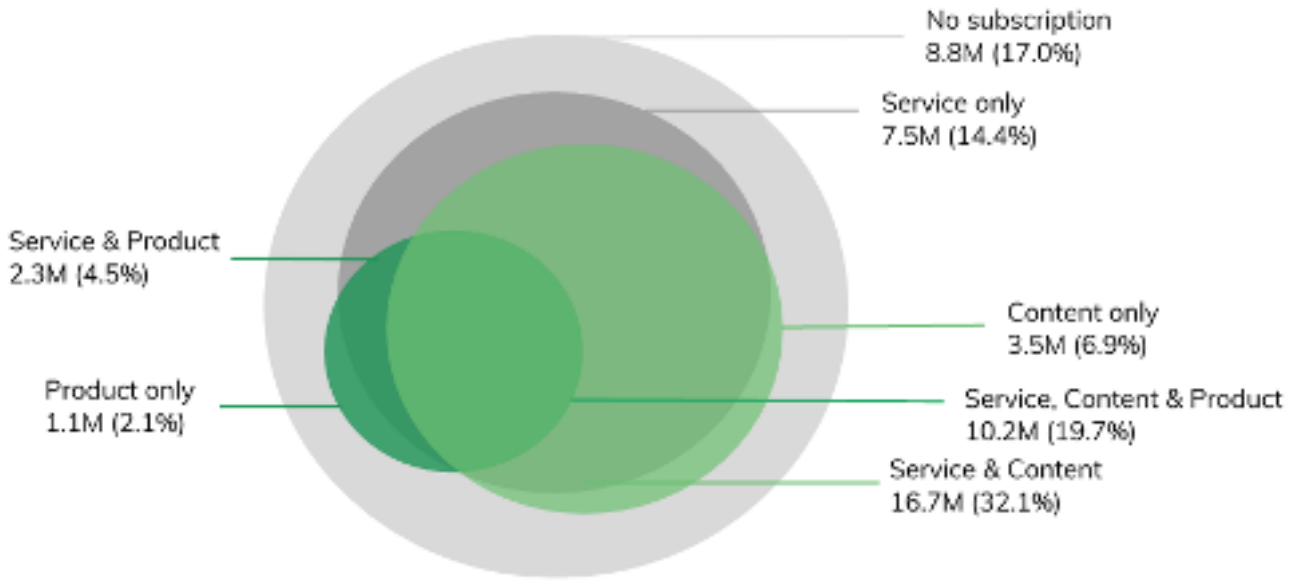

Figure 1: Market size and percentage of UK adult subscribers by subscription type.

the subscription. We find that none of the benefits has a significant impact on a consumer's propensity to purchase a subscription beyond reducing the price.

[1] *Note:* the 10 percentage point rise is based on our calculation, which used the 8m UK Amazon Prime subscribers in March 2017 and compared this figure to the Mintel claim that 26% of the UK adult population was subscribed to Amazon Prime by October 2018. Based on the latest ONS adult population estimates, 8 million adults represented roughly 16% of the UK adult population in 2017. This equates to approximately a 10 percentage point difference between March 2017 and October 2018.

Industry-Specific Subscription Hooks

When looking at each industry individually, we found two significant acquisition drivers for supermarket delivery and TV & film subscriptions, i.e. a free trial period increases the likelihood of a customer subscribing to a supermarket delivery service by 8%. This translates into 10 additional customers for every 100 consumers who see the offer.Meanwhile, consumers are 12% more likely to sign up to a TV & film subscription if offered a no-contract deal. This approach has helped the likes of Netflix and Amazon Prime Video become two of the most popular on-demand video providers in the UK. Both platforms offer a rolling monthly contract, which has seen them accrue almost 10m and 8m UK customers, respectively (Ampere Analysis Ltd, 2019).

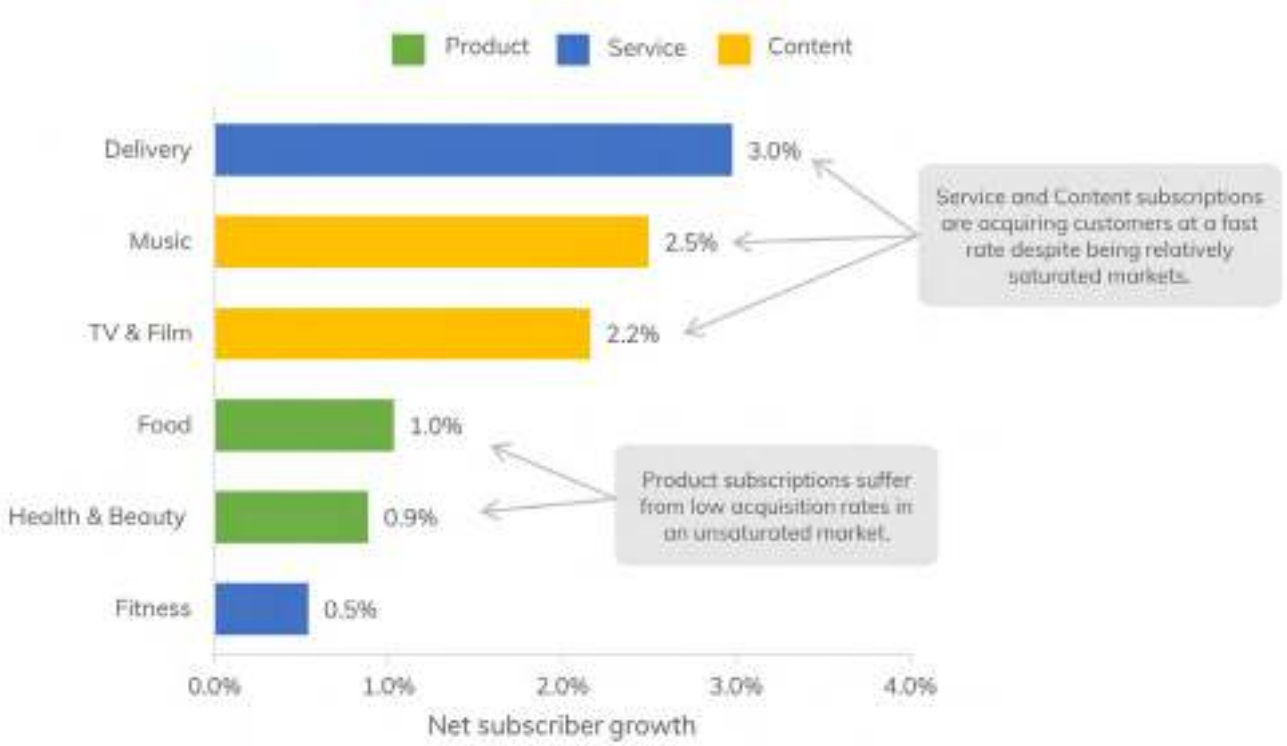

Figure 2: Net growth of subscribers in six industries.

Extending Discount Periods

Beyond reducing the price of their subscription, brands can attract new customers by extending the discount period. This would involve keeping the subscription price low in the first year and increasing the cost in subsequent years, in order to catch up on customer lifetime value. Consumers are temporal discounters and value price reductions early on.

However, this may lead to a race to the bottom, whereby brands have to compete for price-conscious consumers. Consequently, brands that offer the lowest price are more likely to grow their customer base, but this low-balling may also affect customer retention, should brands increase their price later. Therefore, brands should run their own price modelling, to assess the likely outcomes of this approach.

The 'Freemium' Model

Another way to entice subscribers is by offering a basic level of service for free with an option to upgrade to a 'premium' offering for a subscription fee – a model that has worked successfully for Spotify.

The attractiveness of experiencing a small taste of a brand's offering with little commitment is central to the success of the 'Freemium' model. Psychologically, it works in a similar way to try-be-

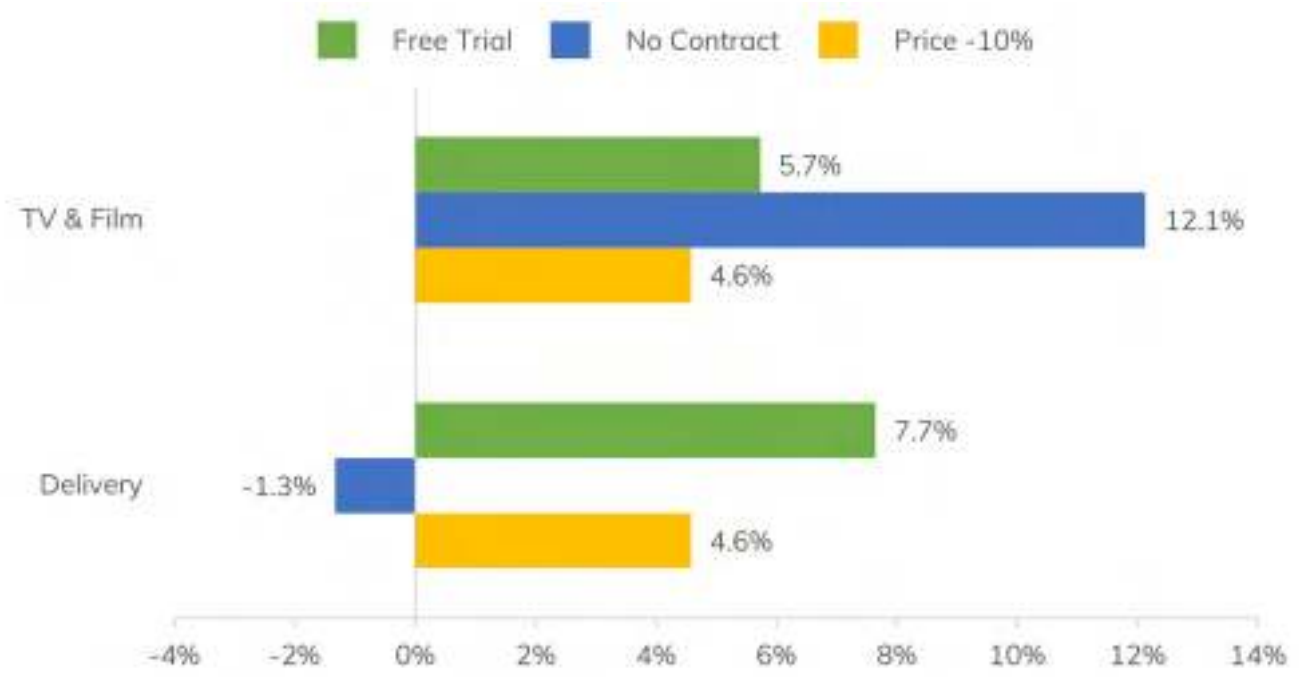

Figure 3: Free trial vs. no contract as an acquisition lever for subscriptions. *Note*: Results shown for industries with statistically significant differences at a 95% confidence level.

fore-you-buy promotions. The notion of free is also consistently overvalued by consumers, who place far greater value in a change in price from just 1p to 0p than the equivalent change of 2p to 1p (Ariely & Shampan'er, 2006). For brands, 'Freemium' subscriptions help them reach more consumers, which is the first challenge in trying to acquire new subscribers, but they also increase the likelihood that subscribers will upgrade their subscription at a cost. Crucially, brands need to balance the appeal of the free service with that of the premium, to ensure sufficient volumes convert to a paid subscription.

Perception Is Reality

Contrary to the perceived wisdom behind the numerous subscriptions that offer sign-up benefits, our experiment does not find that this popular marketing tactic is effective at acquiring customers. However, we expect brands that offer extra subscription benefits in the first year will likely improve consumer price perception, potentially attracting new customers.

A number of brands employ this method, including Virgin Media, which offer discounted SIM-only plans as a benefit for consumers considering signing up to Virgin Broadband. Magazines, especially paper-based ones in an era of digital-first, have also discounted subscriptions to tempt consumers into signing up.

Bundles of Value

Nevertheless, some companies may be able to go further than this and bundle multiple subscriptions together. In the telecoms industry, this bundling is referred to as "quad-play", whereby consumers sign up to landline, broadband, TV and mobile services through one subscription. One of the main attractions of this proposition for customers is that they have fewer suppliers to deal with and may stand to benefit financially from a multi-package deal.

Not only can this proposition help brands win new customers, but for firms with sufficient resources it can act as a retention driver, too. In the case of quad-play, a customer who is considering leaving would have to reckon with losing four useful services – and potentially have to replace one subscription with four separate ones.

The Importance of Consumer Psychology

Furthermore, brands that incorporate considerations about consumer psychology into their subscription propositions will most likely improve their acquisition rates. Our suggestions to introduce extended subscription benefits, as well as bundle propositions where possible, affects people's risk calculation (Samson, 2017). Consequently, consumers are more likely to sign up to a subscription. Framing propositions in these ways can attract new customers. Done well, the right framing can signal to consumers the superior quality of a brand's offering.

Chapter Three: Churn Landscape

What do intrinsic demand, frequency of contact and negative feedback have in common? They all threaten the viability of direct-to-customer Product subscriptions. Despite the fanfare for D2C propositions, our research shows an alarmingly high churn rate.

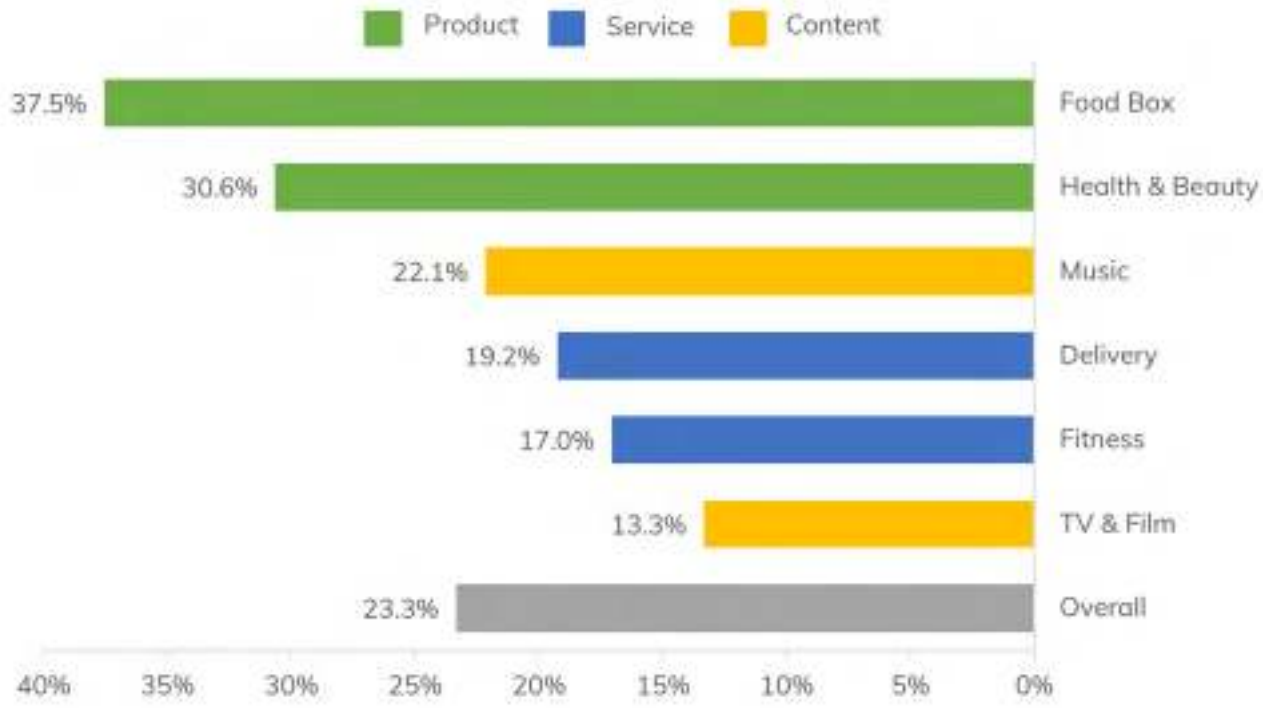

Figure 4: Annual churn of subscription types across six industries.

Failing to Deliver

The customer retention rates experienced by the more established industries we tested, such as TV & film and delivery service subscriptions, fare much better than new industries such as health & beauty. In fact, the churn landscape paints a bleak picture for Product subscriptions. Over a 12-month period, we find the highest churn rates across the six industries are for health & beauty and food recipe boxes (31% and 38%, respectively).

Whilst D2C subscriptions are meant to offer customers a more personalised service and greater efficiency, our experiment indicates that customers are not convinced.

Keeping It Exclusive

Only 13% of TV & film subscribers cancel their subscription after 12 months, which is the lowest annual churn we found across the six industries. One of the reasons why the churn rate for Content subscriptions is so much lower than that of D2C propositions is because of a lack of intrinsic demand.

Consumers are attracted to the exclusive content

provided by platforms such as Netflix and Prime Video. Netflix's Original shows are incredibly popular – its "Stranger Things" production alone was watched by 64m people worldwide (Mendelson, 2019). Similarly, some products are only available to buy on Amazon, which helps keep the churn rate as low as 19% for delivery service subscriptions.

The inherent demand that brands like these have baked into their business models does not apply to many D2C propositions. Instead, a great deal of the same products can be bought elsewhere, without the need for a subscription, which consequently reduces consumer demand for the product. Brands should therefore carefully consider whether their product is optimised for D2C subscriptions.

Avoiding Weak Spots

Another reason for the much higher churn rates of Product subscriptions is the regular touchpoints with consumers on delivery. Customers usually receive their D2C product after a payment is taken. Whilst the subscription may be forgotten about between deliveries, the frequency and physical delivery of D2C propositions reminds people of their subscription on a regular basis. This may prompt them to review and cancel their subscription.

In contrast, there are fewer touchpoints with Content and Service subscriptions, and, importantly, these interactions do not coincide with the payment cycle. This helps keep the churn rate low. Touchpoint frequency does not necessarily affect the likelihood of cancelling Content or Service subscriptions: high frequency interaction implies the subscription is valuable to the consumer and so reduces the chance of churn, while low frequency interaction may see the consumer forget about the subscription and so, without any reminder to cancel, be less likely to churn.

Additionally, consumers can utilise their Content and Service subscriptions at any point during the payment cycle. Consequently, consumers' interactions with these subscriptions are more positive. Even with a Service subscription like Amazon

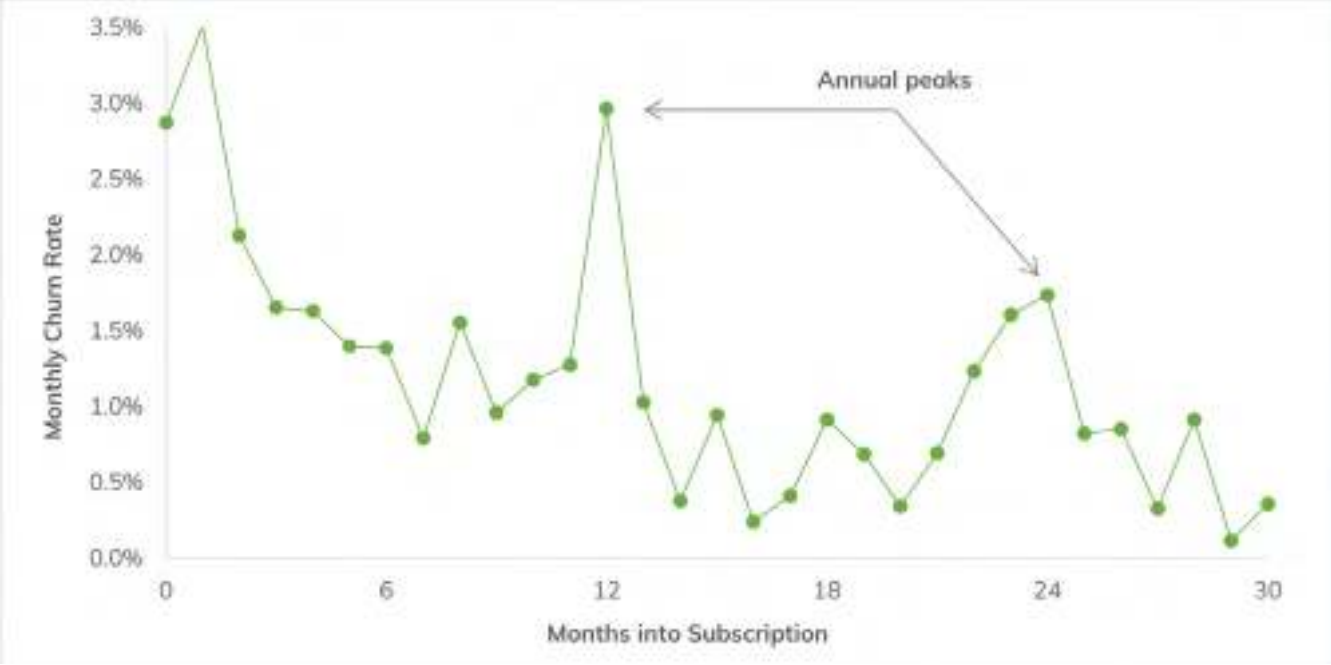

Figure 5: Churn rates across all industries.

Prime, where a physical product is delivered, it is the service, not the physical good, that is being paid for. Therefore, the ease and convenience of such Service subscriptions provide positive interactions between the customer and their subscription.Delivering Negative Feedback

Consumers' interactions with physical products offer a further reason as to why Product subscrip-

tions experience high churn rates. Consumers who are not persuaded by the value of their subscription receive regular reminders to judge the quality of the same good. Without continuous reassessments, human inertia would likely see consumers continuing the subscription.

For example, a customer who signs up to a men's grooming product may realise after a few deliveries that the quality of the product is not good value. Unsurprisingly, consumers with similar experiences are more likely to cancel their Product subscription.

Importantly, whilst consumers also frequently interact with Content and Service subscriptions, the greater variety means that they have more opportunities to match their experience of the subscription with their preferences.

De-Risking Churn Rates

Strikingly, our analysis of the behavioural survey finds that the rate of subscription cancellations at a given time – the churn rate – tends to run above average every 12 months for all industries we tested (see Figure 5). With many subscriptions lasting 12 months, brands that automatically enrol customers onto a new subscription may improve their cus-

Figure 6: Churn rates for subscriptions that include an initial discount vs. free trial across all industries.

tomer retention rates.

Chapter Four: Retention Levers

The two main factors that reduce the rate of churn are an initial discount and, somewhat paradoxically, no-contract subscriptions. Our research finds that greater flexibility encourages more customers to stay with brands.

Our behavioural survey was designed so that we could determine the factors most likely to cause people to cancel their subscription, such as cost, quality of service and whether a better alternative was available. We found that an initial discount to the subscription price and not locking customers into a contract have the greatest effect on reducing churn.

The Best Things in Life Aren't Free

The findings reveal an initial discount offer is the most powerful lever for customer retention, halving

annual churn from 23% to 12% across all subscription types in our research. What is also noteworthy is the significant impact of a discount period on health & beauty and food recipe box subscriptions (-8% and -4%, respectively), both of which experience high churn rates.

Conversely, a free trial period leads to much greater churn during the first few months of the subscription. Consumers are three times more likely to cancel a subscription with a free trial than one with a discount in the first month.

Loyal Customers Love Freedom

A key insight to emerge from our survey is the draw of no-contract subscriptions, which allow customers to cancel their contract at any time, contradicting commercial wisdom on contracts and consumer behaviour.

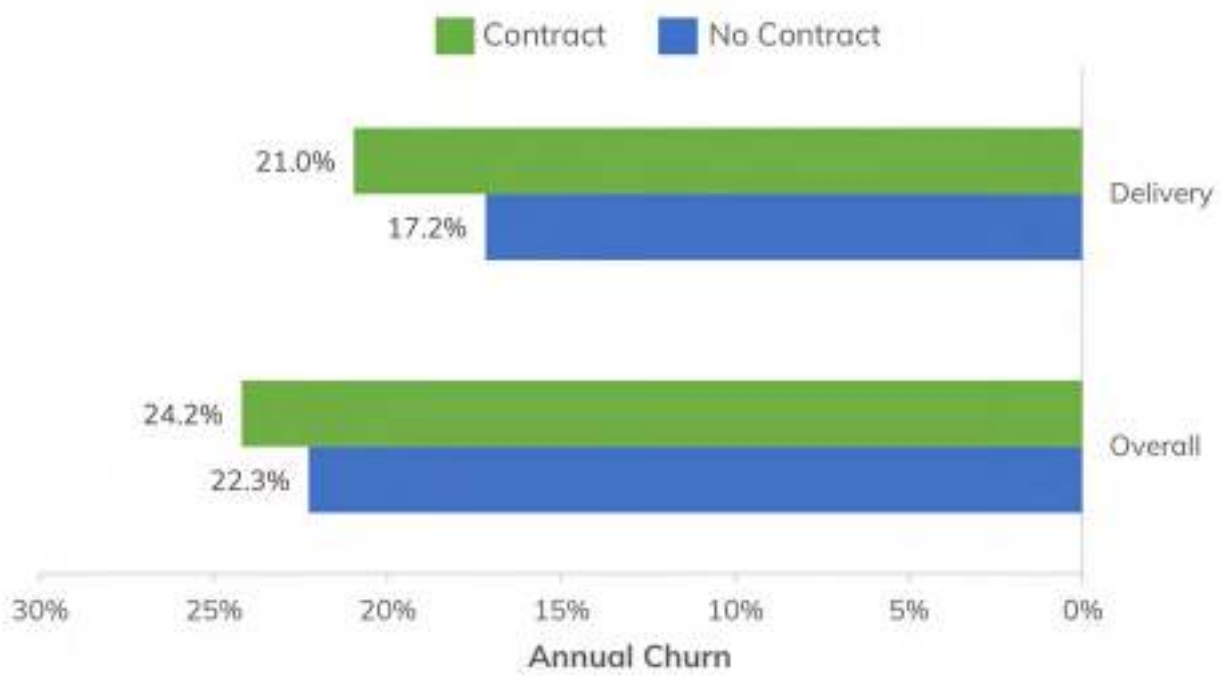

Figure 7: Annual churn for contract vs. no-contract subscriptions. *Note*: Results shown for industries with statistically significant differences at a 95% confidence level.

In contrast with longer-term contracts, we found that giving customers the flexibility to cancel their subscription at any time significantly reduces cancellation rates. Across six industries, we find a 2% decrease in customer churn over 12 months for such subscriptions.

While the unpredictability of no-contracts may sound counterintuitive from a business perspective, rolling contracts actually avoid the regular reminders that define contract subscriptions, whereby each payment period acts as a trigger for customers to reconsider their subscription. Clearly, this reconsideration can increase customer churn.

A no-contract offer also influences consumers' perceptions of the product, service or content on offer. By offering a flexible subscription, the brand signals to the consumer its superior quality. More broadly, while subscriptions do often improve retention, our research suggests that a rolling monthly contract is a better subscription model that will benefit companies in the long term.

Recommendations

1. **Roll out no-contract subscriptions for better retention.** By offering no-contract subscriptions, brands will see lower churn rates. Some sectors,

such as TV & film subscriptions, can also benefit from better customer acquisition rates.

2. **Make trial periods cheaper rather than free.** Subscriptions with an initial discount will typically lead to better customer retention than a free trial. Unless the free trial yields enough acquisition uplift, the discount approach offers better unit economics.
3. **Look before you jump with D2C Product subscriptions.** With higher churn and harder acquisition, Product subscription providers should be sure of their business case before launch. Downstream cross-sales or a halo impact on traditional pay-as-you-go retail sales may offer some mitigation of poor standalone economics.
4. **Know your target audience.** Effective targeting will substantially lower customer acquisition costs. Brands should own the problem of direct marketing optimisation, rather than delegating this to a digital agency. Crucially, this targeting should incorporate forecast churn, and hence customer lifetime value, rather than simply sales and margin.

Detailed Methodology

Behaviourlab Paradigm

Behaviourlab is our bespoke online test platform that utilises randomised controlled trials to answer key commercial questions. The method follows modern academic standards of eliciting consumer preferences.

This research involved taking participants through a realistic simulation of purchasing a product through a retailer's website. Each participant was required to make three purchases for each of the three subscription types selected at random from the six industries explored.

The propositions were all unbranded so that the impact of different acquisition levers could be measured cleanly, without the influence of branding. The subscription price was varied at random around the current market price. Six different sign-up benefits were also tested, with either one randomly shown or none. Participants were required to indicate their likelihood to purchase. The analysis involved statistically modelling whether the addition of certain benefits influenced purchase intentions.

Behavioural Survey

Participants were also required to answer a short behavioural survey about the subscription products they currently have or have had in the last 12 months, which benefits were included and whether they have cancelled any subscriptions, when and for what reason.

This information was used to determine the percentage of UK adults who hold multiple subscription types, one type of subscription or no subscription. We also sized the subscription market at an industry level and compared it to the annual customer acquisition rates across the six industries explored herein. Using churn data, we created the hazard rates for each industry.

Survival Analysis

Survival analysis was conducted to understand customer retention across different subscription products and the impact of different benefits on retention. A broader range of industries was included, in order to increase the reliability of the results, but with the key six industries explored in detail.

The parameter of estimation was the number of months the subscription was held. The impacts of customer characteristics and proposition benefits were modelled, to predict the type of customer and elements of a proposition that significantly improve retention.

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Career Coaching Builds Confidence in Experienced Workers: What Governments Should Be Thinking About for Reskilling Initiatives Post-COVID – and Why

Gerard Creaner, Sinead Creaner, Claire Wilson and Colm Creaner*

GetReskilled

With the end of the COVID pandemic in sight for first-world countries, government focus will shift to re-building economies. This will likely involve workforce reskilling initiatives for new jobs in thriving economic areas. The authors have initial data to suggest that adding career coaching to technical training programmes builds confidence in experienced workers, and results in an overall positive impact on their outlook regarding the future. This is an unanticipated "bonus effect" in addition to the classic tangible metrics of reskilling programmes. Since 2017, Confidence Metrics have been measured across 1,074 workers and, surprisingly, been found to remain high during 2020 despite the economic fallout from COVID. The hypothesis relating to the "bonus effects" of more confident and resilient workers needs further study, but if shown to be reliable, including job-hunting skills within reskilling programmes, it could prove useful to both governments and the private sector alike.

Introduction

As vaccination roll out progresses (Public Health England, 2021) and cases begin to fall (Office for National Statistics, 2021), the COVID-19 pandemic in first-world countries is changing. Government focus will soon move from tackling a healthcare crisis, to tackling the looming economic one (Beckett, 2021). A large part of this effort will involve retraining displaced workers for new jobs in thriving local industries.

This paper examines the practical experience and research background of one private training provider with over 10 years' experience reskilling mid-career workers for employment in a growing technical and highly regulated industry.

What's more, that experience is in an online environment and working alongside a long-running, currently active government retraining scheme (Higher Education Authority Ireland, 2021).

This paper offers insights into how to maximise the efficiency and effectiveness of such programmes.

Relevant Background Information

The demographics of the 1,074 experienced workers (2017-2020) are as follows:

- Based in Ireland
- Taking same reskilling course
- 38% female; 62% male
- 45% <40 years; 55% >40 years
- 28% employed; 72% unemployed

They came from a range of other industries, including food and beverage, finance, administration, healthcare and construction.

All received Irish Government funding through the Springboard+ reskilling initiative (Higher Education Authority Ireland, 2016), whereby the government paid either 90% or 100% of their course fees.

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Our reskilling programmes have been delivered online for over 10 years now. The team utilises an action research approach to updating course offerings in response to new evidence or participant feedback, whereby the authors work through a seven-step process in a continuous cycle – as per Ernest Stringer's Action Research Interacting Spiral (Stringer, 2007).

Due to the online delivery method, programmes were not impacted by the COVID-19 pandemic or the associated social distancing requirements. This is particularly relevant, since Ireland spent the majority of time from March 2020 onward in level 5 lockdown due to the ongoing pandemic (Department of the Taoiseach, 2020).

The programmes are all designed to transition experienced workers from other industries into the pharmaceutical and medical device manufacturing sector, which offers high-paying, high-tech jobs in a stable, secure and growing sector in Ireland (Halligan, 2016).

During the pandemic, the pharmaceutical and medical device manufacturing industry in Ireland remained open, and hiring (Creaner, 2020). There are over 62,000 people employed directly by this sector, and a further 120,000 employed indirectly (GetReskilled, 2021). In total, this accounts for almost 10% of the Irish workforce (IDA Ireland, 2021).

Adding Career Coaching to Technical Modules

Our business was initially delivering technical modules to provide experienced workers from other sectors with the industry-specific information they needed to secure an entry-level role.

In 2016, we realised there was more we could do to improve the success rate of our participants securing employment in the industry.

We observed that many workers had poor job-hunting skills, particularly when moving into a new or an unfamiliar sector. While almost everyone thinks they know how to job hunt, it's our experience that very few can actually implement best practice in this regard.

To overcome this issue, we developed a career coaching strategy to complement the technical learning, which included a "Job-Hunting Skills" module for the experienced workers on our programmes.

The module was designed to walk the experienced worker through finding their ideal job within this new sector (aligning with relevant skills from their work experience to date) and then through the job-hunting process, step-by-step – including where to look, how to network, how to write a CV and understanding key interview skills.

After spending five weeks studying guided activities (approximately 50 hours of study time), workers would submit an assignment that simulated a job application and recruitment process. They were given three real historical job adverts to choose from and complete tasks that included tailoring their CV, writing a cover letter, considering their relevant network contacts, writing follow-up emails and scripting sample interview answers as if they were applying for one of these jobs.

Assessing the Effectiveness of Job-Hunting Skills

We assess the effectiveness of this Job-Hunting Skills module in four separate ways:

1. **Knowledge and Ability to Implement:** Using a multiple-choice assessment of 10 questions, participants choose which answer most closely matches their approach to various aspects of job-hunting, following the action mapping approach suggested by Cathy Moore (2007). Scores do not count towards their grade in the module, and participants are asked to answer honestly. Scores show how well their answers align with current best practice job-hunting advice. This is the first task in the module and is revisited as one of the final tasks, to capture the change in their knowledge and understanding.
2. **Module Feedback:** The experienced workers give both quantitative ("star rating" out of 5, in response to the question "*How would you rate your overall experience of the Advanced Coaching programme so far?*") and qualitative feedback at the end of the Job-Hunting Skills module.
3. **Successful Outcomes:** We measure "successful

outcomes" for all experienced workers on our programmes. The successful outcomes are defined as a participant either finishing the course, getting a job or both. This snapshot of success is taken within six months of the course finishing.

4. **Confidence Metrics:** We capture feedback from participants at the end of their reskilling programme – a key feature of this is a range of "Confidence Metrics" through which the participants' confidence is assessed across a range of future aspirations.

The rest of this paper will first discuss the baseline for these effectiveness measures, by considering results from a "pre-pandemic group" (experienced workers reskilling between 2017 and 2019), before assessing how that effectiveness has been affected by the pandemic, by outlining the results of our "pandemic cohort" (experienced workers reskilling during 2020).

Pre-Pandemic Group 2017-2019: Establishing the Baseline

Our pre-pandemic group consists of a total of 923 experienced workers: 329 in 2017, 315 in 2018 and 279 in 2019.

A total of 597 of these completed the end-of-programme survey: 217 in 2017, 197 in 2018 and 183 in 2019.

In 2017, the Job-Hunting Skills module was introduced as an optional module, with 20% of experienced workers opting in.

In the latter half of 2018, and after successful proof of concept, the module was made mandatory. Since the 2018 group includes a mix of both opt-in and mandatory module participants, a total of 57% of all 2018 participants completed the module.

In 2019, the module was made mandatory for all experienced workers, so 100% of participants completed it.

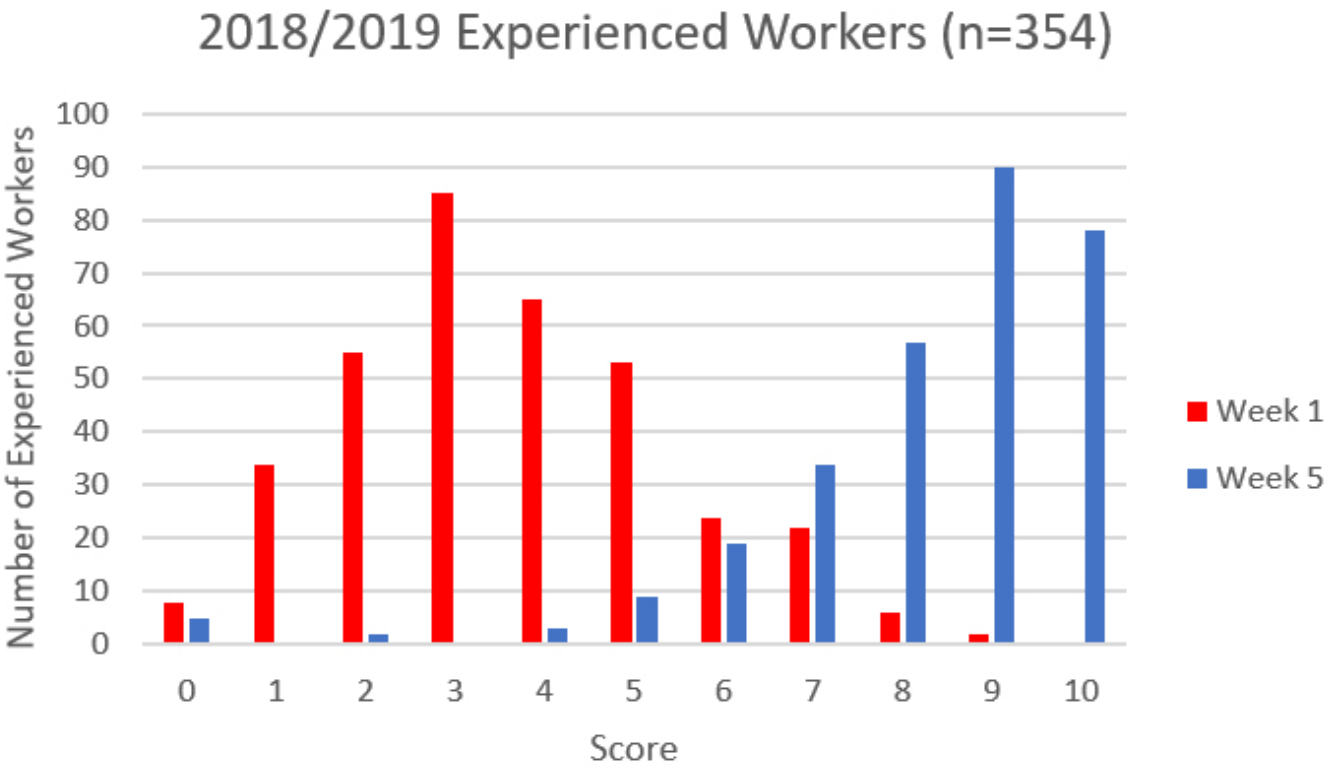

Figure 1: Results of knowledge and ability to implement assessment (2018-2019).

The effectiveness measures were as follows:

1. Knowledge and Ability to Implement

The multiple-choice assessment was introduced within the module in 2018, so the data for Figure 1 are gathered from 2018 and 2019 participants only.

From Figure 1, we can see a change from the week one assessment scoring of experienced workers' knowledge and ability to implement best practice job-hunting techniques (mean=3.85) and their week five scores (mean=8.51), which is statistically significant ($t=30.89$, $p<0.05$).

This suggests that the module is successfully equipping participants with knowledge of job-hunting best practice and the ability to implement it successfully.

Moreover, the initial assessment serves as an anchor by which the experienced worker can see their own progress over the course of the module, thereby serving to increase self-belief in their new skills.

2. Module Feedback

Table 1 shows the average results of the participant star ratings (out of 5) which were captured at the end of module feedback from a total of 182 participants during 2018 and 232 during 2019. Module feedback was only implemented in 2018, so there are no data available for the 2017 participants.

We can see from both qualitative and quantitative participant feedback that the experienced workers enjoyed the module, with many saying they found more value than they expected.

From analysing the qualitative answers and talking to participants, we established that there appears to be a common theme in terms of experiencing of the module:

- Believing they already know best practice at the start of the module
- Being shocked at how low they score on the knowledge and ability assessment – the first task in week one
- Approaching the module with a much more open mind to learning new techniques for job-hunting
- Taking on board these techniques, practising them and gaining confidence in how to implement them
- Reaching a level of confidence that now accurately reflects their knowledge and ability to implement best practice job-hunting techniques

	2017	2018 (n=182)	2019 (n=232)
Quantitative Feedback: **Average Star Rating out of 5**	N/A	**4.29**	**4.18**
Qualitative Feedback:	"When I started this module, I thought I knew something about job-hunting, but after completing this module I realised I really didn't know anything."		
Participant Feedback	"This module is amazing! I never realised how many mistakes I made before as regards job-hunting. I feel so much more confident now that I have completed this course, and the process will stay with me forever."		

Table 1: Pre-pandemic module feedback.

We were struck by how similar this common experience mirrors that of a classic Delusion of Competence (Kruger & Dunning, 1999), and how effectively the module appears to help move participants through each stage.

This was particularly interesting given that the optional opt-in was low (20%) – even when we told people that previous participants found great value in the module. It seemed like most believed they

were the exception that truly already knew best practice.

We therefore took the decision to make the Job-Hunting Skills module a mandatory part of the programme.

	2017	2018	2019
Finished full programme	142 (65%)	**140 (71%)**	**118 (64%)**
Got job	115 (52%)	**90 (45%)**	**83 (45%)**
...	...	**...**	**...**
specifically in pharma/med device	58 (50%)	**56 (62%)**	**54 (65%)**

Table 2: Pre-pandemic successful outcomes.

3. Successful Outcomes

To compile the dataset in Table 2, we analysed the survey results from the three pre-pandemic years.

From the above, it is evident that the move from optional participation in the Job-Hunting Skills module to mandatory participation had a statistically significant impact of increasing the percentage of experienced workers who successfully found a job in the pharmaceutical or medical device industry within six months of the programme finishing (moving from 50% to 65%; $Z=-2.11$, $p<0.05$).

We can deduce, therefore, that the Job-Hunting Skills module equips students with effective job-hunting skills for their target industry and gives them the confidence to pursue those high-tech jobs, even without previous industry experience.

As a result of this evidence, we were happy to continue with our decision to keep the module mandatory.

4. Confidence Metrics

Confidence metrics were assessed during the end-of-programme survey for all three years. Participants were asked whether their confidence across a range of future aspirations had increased or decreased as a result of participating in the programme.[1]

The nine aspirations assessed were:

- Engagement with lifelong learning
- Ambition for career advancement
- Ambition to get a better-paid job
- Enjoyment of further study
- Confidence in the future
- Determination to succeed
- Motivation for getting a rewarding career
- Confidence in future job security
- Ambition to achieve mastery in their chosen career

For ease of interpretation, this data has been summarised into the average number of workers reporting an increase in confidence, averaged across all nine metrics.

While this was not a deciding factor in making

[1] While there was no option for participants to indicate that a metric "stayed the same" (which we acknowledge as a limitation), they could skip any question they did not wish to answer. Future iterations of this survey will include a "stayed the same" option, to make this point more explicit.

	2017 (n=217)	2018 (n=197)	2019 (n=183)
Job-hunting module participants	83%	**92%**	**93%**
Non-job-hunting module participant	80%	**86%**	**N/A as Job-Hunting Skills module made mandatory**

Table 3: Pre-pandemic confidence metrics.

or keeping the module mandatory, we could see a statistically significant increase in confidence when comparing those who participated in the Job-Hunting Skills module in 2018, against those who did not do so ($Z=2.42$, $p<0.05$).

We hypothesised that the 2018 iteration of the Job-Hunting Skills module was increasing confidence by reducing participants' uncertainty. The module takes a large and complex process and breaks it down into manageable, bitesize pieces. We believe that, in doing so, participants are left feeling like they understand the job-hunting process better and are motivated by their own ability to complete each piece successfully.

Not only does this seem to give participants hope of finding a job during their current job search, but we believe it also provides them with reassurance in terms of their ability to job hunt successfully in the future, if they need to do so. This, in turn, appears to have a positive effect across the range of future-looking Confidence Metrics.

Pandemic Cohort 2020 – Impact of the Pandemic on the Baseline

Our pandemic cohort consists of 151 experienced workers, each of whom took a reskilling programme in 2020. All participants were given the Job-Hunting Skills module, and 97 of them completed the end-of-programme survey.

Of the four effectiveness measures, we expected the first three to remain relatively unchanged by the circumstances of the pandemic and its economic fallout. We did, however, hypothesise that we'd see a notable decrease in the Confidence Metrics, as the UK Office for National Statistics was reporting that the population felt more worried about the future, as well as more stressed and anxious during the lockdowns (Office for National Statistics, 2021).

The observed effectiveness measures for this group were as follows:

1. Knowledge and Ability to Implement

Figure 2 shows results for the knowledge and ability to implement assessment for the 2020 group.

As expected, we once again see a shift in the mean scores of the experienced workers' knowledge and their ability to implement best practice job-hunting techniques between week one (mean=3.98) and week five (mean=8.59), which is statistically significant ($t=-18.93$, $p<0.05$).

This confirms that the module is still successfully equipping participants with knowledge on job-hunting best practice and the ability to implement it successfully, independent of the unique destabilising effects of the pandemic.

2. Module Feedback

Table 4 shows the average star ratings from the end-of-module feedback from 97 experienced workers in 2020.

Similarly to previous years, we can see from the participant feedback that the experienced workers enjoyed the module and took a good deal of value from it.

Qualitative feedback again shows that participants are still moving through a cycle of not initially being motivated by the prospect of the module, being shocked at their low current knowledge of best practice, learning and practicing best practice, before reaching an appropriate level of confidence.

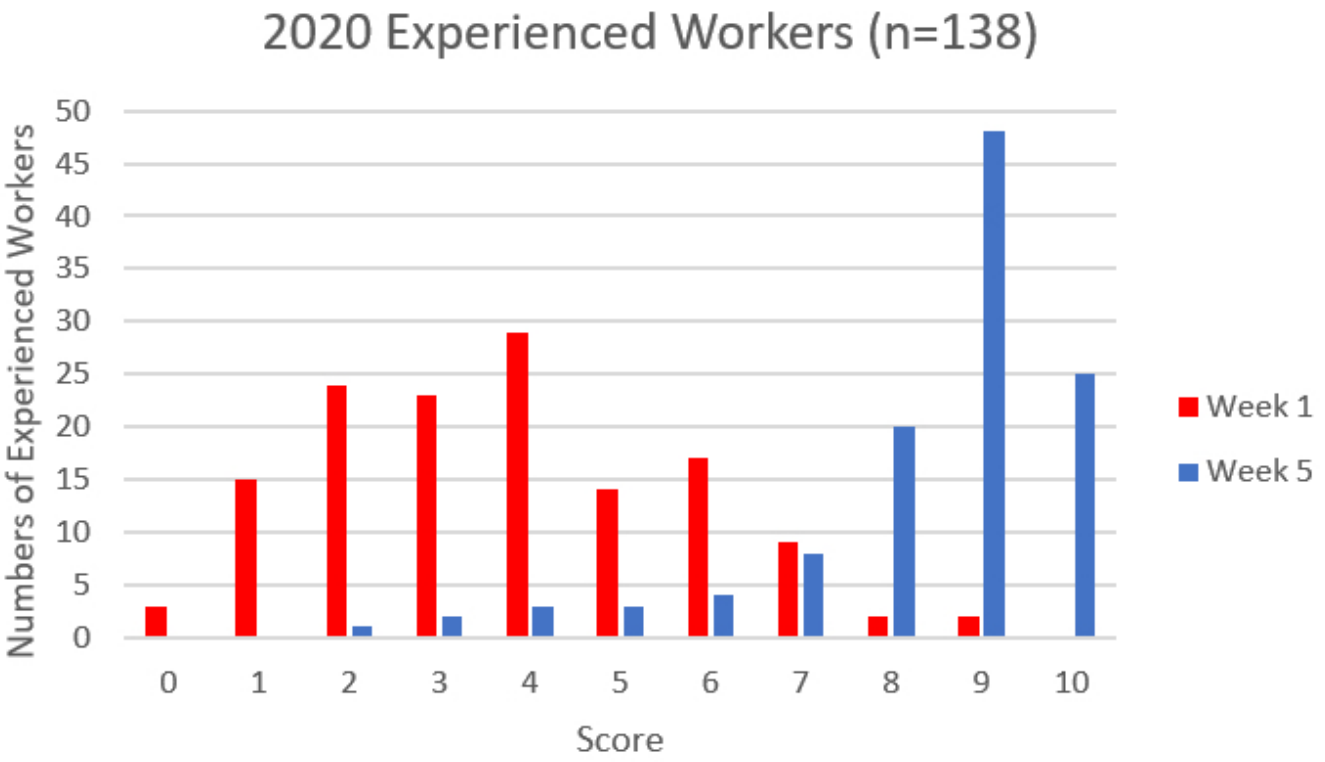

Figure 2: Results for the knowledge and ability to implement assessment (2020).

	2017 (n=217)	2018 (n=197)	2019 (n=183)	2020 (n=97)
Quantitative Feedback: **Average Star Rating out of 5**	**N/A**	**4.29**	**4.18**	**4.31**
Qualitative Feedback:	"At first, I thought this would not be something important to me... but now I see it is even more important than technical skills."			
Participant Feedback	"When I first began this module, I was skeptical, because I thought my CV and cover letter were good enough and I felt it was just the lack of experience as the reason why I wasn't securing employment in the pharmaceutical industry. Now that I have completed this, I can see how wrong I was."			

Table 4: Pandemic module feedback.

3. Successful Outcomes

In Table 5, we analysed successful outcomes reported in the end-of-programme survey.

As expected, there was no significant difference in the percentage of people getting a job (in pharma/med device or not) when we compared 2020 to 2019, as the industry kept hiring throughout the lockdowns.

There was, however, a statistically significant increase in the percentage of experienced workers finishing the programme, from 64% in 2019 to 80% in 2020 ($Z=-2.57$, $p<0.05$). Since the programme is delivered fully online and many workers were furloughed at home during this time, this is perhaps an unsurprising outcome.

4. Confidence Metrics

We assessed the same nine aspirations as previously detailed.

As before, for ease of interpretation the data have been summarised into the average number of workers reporting an increase in confidence, averaged across all nine metrics.

Unexpectedly, our hypothesis of a fall in Confidence Metrics was not seen in the data. In fact, the

	2017	2018	2019	2020
Finished full programme	**142 (65%)**	**140 (71%)**	**118 (64%)**	**78 (80%)**
Got job	**115 (52%)**	**90 (45%)**	**83 (45%)**	**39 (40%)**
...	**...**	**...**	**...**	**....**
specifically in pharma/med device	**58 (50%)**	**56 (62%)**	**54 (65%)**	**23 (58%)**

Table 5: Pandemic successful outcomes.

	2017 (n=217)	2018 (n=197)	2019 (n=183)	2020 (n=97)
Job-hunting module participants	**83%**	**92%**	**93%**	**93%**
Non-job-hunting module participant	**80%**	**86%**	**N/A as Job-Hunting Skills module made mandatory**	**N/A as Job-Hunting Skills module made mandatory**

Table 6: Pandemic confidence metrics

"bonus effects" of the Job-Hunting Skills module stayed the same as 2019 (at a high of 93%) and appeared to be independent of the economic impact of the pandemic.

Our belief in the module being in the best interests of our participants, and the decision to make its inclusion mandatory, means that we don't have a control group (who didn't take the module) to compare against. Nevertheless, we believe the ONS reporting of the population feeling worried about the future, as well as stressed and anxious – see Figure 3 (Office for National Statistics, 2021) – provides an appropriate basis for comparison.

We shall now consider possible explanations for this surprising occurrence.

Interpreting our Surprising "Pandemic Data"

Based on the reports from the UK Office for National Statistics, our team had hypothesised that our Confidence Metrics would reduce within our "pandemic cohort" in 2020 – but in fact they stayed the same as the previous pre-pandemic group.

We wanted to explore why this might be happening.

There are some reasonable explanations that immediately come to mind for why confidence may

have remained high for the pandemic cohort:

- These experienced workers were moving into the pharmaceutical and medical device manufacturing industry in Ireland, which continued to hire throughout the lockdowns (NIBRT, 2020)
- The experienced workers were all beneficiaries of a government-funded reskilling programme (Higher Education Authority Ireland, 2021), so they faced little or no financial risk
- Both the technical programme and the Job-Hunting Skills module were purposely developed to be delivered in an online format, and so studies could continue independently of lockdowns

However, as we had already observed increased Confidence Metrics to the same level within the pre-pandemic cohort – and shown that increasing participation in the Job-Hunting Skills module led to increasing Confidence Metrics – the points above did not fully account for the results we were seeing in 2020.

Why didn't we see the same fall in Confidence Metrics that was seen in other government and na-

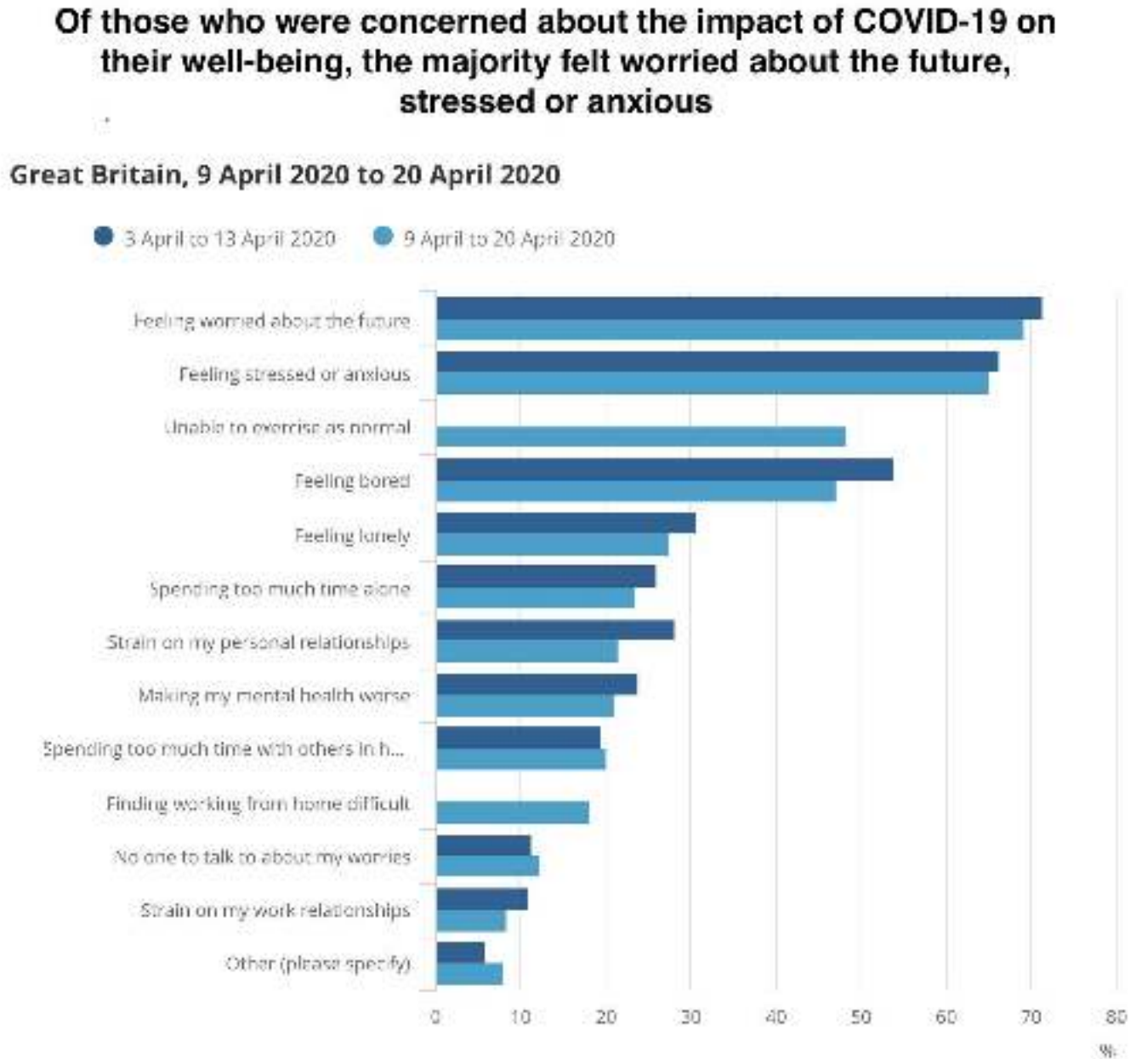

Figure 3: ONS – Impact of COVID-19 on the adult population in Great Britain, April 2020. *Source*: Office for National Statistics – Opinions and Lifestyle Survey

tional studies?

The team moved to exploring the concept of psychological resilience as a possible explanation.

Studies show that one of the factors leading to a person's ability to demonstrate resilience is being able to make realistic plans, being able to follow those plans, having confidence in their strengths and abilities and demonstrating solid communication and problem-solving skills (Padesky & Mooney, 2012).

Building resilience for an individual means being prepared for challenges, crises and emergencies, and feeling like they have reliable contingencies in place to deal with unexpected future scenarios (de Terte & Stephens, 2014).

In other words, they are building self-efficacy beliefs, i.e. tying their strong beliefs to what they understand to be their capability level (Bandura, 1977).

The Job-Hunting Skills module makes an actionable process out of finding a job. It demystifies the steps involved and breaks down the process into bitesize pieces that build on previous knowledge.

It is taught as a cyclical and continuous process that each person works through repeatedly, gaining confidence with each iteration. At the end of the programme, the experienced worker comes away with a plan that is applicable across all job hunts, both now and in the future (i.e. it's their reliable contingency).

We hypothesise that the feeling of self-efficacy gained from the module means that experienced workers believe they now have the improved abilities to deal with an ambiguous future.

We see their resilience and confidence in the future as an unanticipated "bonus effect" of the current Irish Government-funded reskilling programme, in which we bring together both job-hunting and technical skills.

Implications for Future Government Reskilling Programmes

We note that our findings on "bonus effects" are preliminary and that more research is needed to confirm that implementing job-hunting skills continues to offer these, as well as improving traditional success metrics across other circumstances.

To do so, testing its implementation within a different industry niche, a different age and experience group and a different geographical location would all be useful. For our own next steps, we plan on replicating this project in another country.

While job-hunting skills are typically low priority in large-scale reskilling initiatives, if these effects can be shown to be reliable, we believe they could form an essential part of being able to transition successfully into a new industry, alongside gaining the appropriate technical skills.

It is important to note that while the inclusion of a Job-Hunting Skills module will not result in a 100% job success rate, we found that the implementation of a mandated industry-specific component had the measurable impact of getting more people into jobs in their intended industry.

However, building a resilient workforce has benefits beyond "equipping them with knowledge" and "getting people into work."

The traditional measurables of successfully completing a programme and/or getting a job, combined with the added "bonus effects" of the increased Confidence Metrics, could leave future reskilling efforts with a realistic opportunity to really go above and beyond.

In the private sector, this would be termed "delighting the customer." And while it's not necessarily a primary outcome measure for government programmes, it is an opportunity for an additional "successful outcome" as a result of the public spending involved in large-scale workforce reskilling.

As a private training provider, we acknowledge that we're in a uniquely agile position to test and implement such initiatives that cannot necessarily be easily replicated by governments or traditional academia. Nonetheless, there are definitely opportunities for testing, and while it might not be easy, our findings suggest that the benefits might be worth pursuing.

Imagine a society where a population displayed an increase in the nine factors within our Confidence Metrics despite extreme circumstances such as a pandemic. This unanticipated benefit of "delighting the customer" suddenly becomes something to

strive for, in the public and private sectors alike.

And if that is indeed the case, we ask if governments could make use of these observations to develop and implement their own programmes, in order to assess and capture the "bonus effects" – as well as traditional successes – when implementing reskilling initiatives in a post-COVID world.

The Authors

Gerard Creaner has over 30 years of experience in the life sciences manufacturing industry across a range of technical, managerial and business roles. He established a very successful engineering consultancy prior to founding GetReskilled, an online education and learning business, with offices in Singapore, Ireland and Boston (USA), focused on the manufacture of safe and effective medicines for the public. He is also a founding director of two Singapore-based philanthropic organisations, namely the Farmleigh Fellowship and the Singapore-Ireland Fund, both of which deepen the well-established and historical Singapore-Ireland relationship and deliver long-term benefits to both countries. Gerard has an undergraduate degree in Chemical Engineering (UCD, 1980) and an MSc (Management) from Trinity College Dublin (2003), and he is currently doing research for his Ph.D. on the decision-making of experienced workers.

Sinead Creaner is research lead for the GetReskilled research team. She has co-authored a series of papers over the last couple of years looking at the decision-making processes of experienced workers in the field of behavioural science. She also works with GetReskilled's Springboard+ and BSc students. She has extensive international experience, having lived, studied and worked in Ireland, Singapore, Australia, Boston MA and London UK over the last 12 years.

Claire Wilson runs GetReskilled's career coaching strategy – including the specially designed Job-Hunting Skills module. She is extremely enthusiastic about helping people reach their final goal of employment in their new career path. Claire has a BSc (Hons) in Medical Biology from Edinburgh University and spent seven years working in the pharmaceutical and medical device industries.

Colm Creaner is a university student who is completing a research internship with GetReskilled. He has previously completed research work with the company in this area and participated in other publications with the research team.

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RESOURCES

Behavioral Science Concepts*

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 ben-

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efit 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).

Chunking

When the same information is presented in a different form that is easier to process, our ability to receive and remember it is greater. People often reorganize, regroup or compress information to aid in its understanding or recall. The resulting subgroups are 'chunks', which can be defined as a set of information or items that are treated collectively as a single unit (Mathy & Feldman, 2012). Chunking may be done through strategic reorganization based on familiarity, prior knowledge, proximity or other means to structure the information at hand. For example, a phone number may be split up into three subgroups of area code, prefix and number or one might recognize a meaningful date in it, and so can organize it more easily into different chunks.

In relation to the ideal amount of chunks, Miller (1956) found that humans best recall seven plus or minus two units when processing information. More recently, various studies have shown that chunking is, in fact, most effective when four to six chunks are created (Mathy & Feldman, 2012). Although this seems to be a 'magic number', it is also possible to learn to increase the size of those chunks over time (Sullivan, 2009).

In behavioral science, chunking has also been used to refer to breaking up processes or tasks into more manageable pieces (see for example Eşanu, 2019, on chunking in UX design or Wijland & Hansen, 2016, on mobile nudging in the banking sector).

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 consistent 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 cancer screening (Stoffel et al., 2019).

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 opportunity 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 heuristic"**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 allocation** 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 pro-

gram 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.

Primacy effect

See **Serial-position effect**

(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).

	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

Figure 1. Prospect Theory Quadrant

(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 **pre-commitment**, 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).

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).

Recency effect

See **Serial-position effect**

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 no-

tices 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"Availability heuristic"**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 (See also **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**.)

Serial-position effect

The serial-position effect refers to the finding that items (e.g. word, picture or action) that are located either at the beginning (primacy effect) or end (recency effect) of a list are more easily remembered (Ebbinghaus, 1913). These effects have also been extensively studied in social psychology. Research on persuasion, for example, has found primacy effects to be stronger when the issue in a message is relevant or familiar to individuals, and recency effect more likely to occur when the issue is less relevant or familiar to them (Haugtvedt & Wegener, 1994; Lana, 1961).

The serial-position effect should not be confused with more general order effects, which refers to context effects produced by the order of items, such as questions in a research instrument. (See also anchoring and peak-end rule.)

Sludge

The two defining characteristics of a sludge (Thaler, 2018) are "friction and bad intentions" (Goldhill, 2019). While Richard Thaler strongly advocates nudging for good by making desirable behavior easier, a sludge does the opposite: It makes a process more difficult in order to arrive at an outcome that is not in the best interest of the sludged. Examples of sludges include product rebates that require difficult procedures, subscription cancellations that can only be done with a phone call, and complicated or long government student aid application forms.

Even when a sludge is associated with a beneficial behavior (as in student aid, voter registrations or driver's licenses, for example), costs can be excessive. These costs may be a difficulty in acquiring information, unnecessary amounts of time spent, or psychological detriments, such as frustration (Sunstein, 2020).

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 vari-

ous 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 proposer/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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This degree provided networking opportunities and access to academics at a level that isn't available anywhere else in the world.

Joshua, 2019 graduate

The EMSc in Behavioural Science was a deeply rewarding experience both personally and professionally.

Claire, 2020 graduate

This is a life changing experience and you will be back to your professional life with a set of new tools that will change your career path.

Guilherme, 2021 graduate

CONTACT US

pbs.emsc@lse.ac.uk

For further information, please visit
lse.ac.uk/EMScBehaviouralScience

Penn
Master of Behavioral and Decision Sciences

Learn the theory, apply the tools, and make a difference

Penn's **Master of Behavioral and Decision Sciences program** equips students with theoretical and practical tools to understand how individuals and groups make decisions, how to affect those decisions, and how social norms play a role in motivating and changing social behaviors. Led by world-renowned faculty, researchers, and practitioners, MBDS creates unique opportunities for students to engage with an exceptional advisory board, apply tools and knowledge in design challenges, and pursue independent, cross-disciplinary research throughout Penn.

From our alumni:

"I facilitated a four-month behavioral consulting project for graduate students who delivered a top-notch final brief and research paper for a real-world problem—as good as anything I've seen from professional consulting firms. The students superbly applied their knowledge of behavioral science to everyday situations and answered tough questions from national and regional leaders during the final presentation."

Alex Willard, MBDS '19
Marketing Strategist, US Army Enterprise Marketing Office

"One of the most rewarding aspects of the MBDS program is the design challenge. Not only does it provide the opportunity to apply theoretical concepts to solve real-world industry challenges, but it also encourages you to proactively identify existing the behavioral biases driving these very challenges. In my current role as a data scientist, I find this to be a valuable skill that has enabled me to better interpret the end result of certain decisions."

Anu Raghuram, MBDS '19
Data Scientist, BlackRock

"Design challenges were a great way to apply what we learned in the classroom towards solving real-world problems. These experiences taught me how to work with stakeholders to define clear project objectives, design, and run effective field research and use data to inform strategic decisions. These skills have proven to be essential for my job in marketing research and guest insights."

Paula Pereira, MBDS '20
Category Manager and Insights at Tim Hortons, Restaurant Brands International

Learn more about our engaged and well-connected alumni at

www.upenn.edu/mbds

Penn
Master of Behavioral and Decision Sciences

Meet the Master of Behavioral and Decision Sciences program's founding director

"Wherever there is a human group there are social norms."
-Cristina Bicchieri

Cristina Bicchieri

Founding Director, Master of Behavioral and Decision Sciences
S.J. Patterson Harvie Professor of Social Thought and Comparative Ethics, Departments of Philosophy and Psychology
Director, Center for Social Norms and Behavioral Dynamics

Cristina Bicchieri is a world authority on social norms and has consulted with UNICEF, the World Bank, the Gates Foundation, the United Kingdom's Department for International Development, and many other organizations. She is the founder of the Master of Behavioral and Decision Sciences program, the Penn Social Norms Group (PENN SoNG), and the Behavioral Ethics Lab. She is also the Director of the Center for Social Norms and Behavioral Dynamics, a newly formed research center at Penn that aims to support positive behaviors on a global scale.

The Center for Social Norms and Behavioral Dynamics

CENTER FOR
Social Norms and Behavioral Dynamics
University of Pennsylvania

The Center for Social Norms and Behavioral Dynamics at Penn, led by Director Cristina Bicchieri, aims to support positive behaviors on a global scale, across both informal and organizational settings. The Center has undertaken a range of projects with partner organizations around the world by leveraging their expertise in measuring behavior, analyzing behavioral data, and identifying systematic behavioral drivers. Master of Behavioral and Decision Sciences students can explore research and learning opportunities at the Center around social norms frameworks and theory. Through the Center, both students and professionals have access to the NoBeC (Norms and Behavioral Change) Talks, which showcase interdisciplinary early career and senior researchers working on norms and behavioral change around the world.

To learn more about the MBDS program's world-renowned faculty and researchers, visit:
www.upenn.edu/mbds

Penn
Master of Behavioral and Decision Sciences

Unparalleled connections, exceptional opportunities

A defining feature of the University of Pennsylvania's Master of Behavioral and Decision Sciences program (MBDS) is its network of outstanding industry and research partners who help bring students exceptional networking experiences, such as internships, design challenges, and employer-driven projects.

From our advisory board:

"As more bright candidates enter the field, we recognize a growing need for higher education to prepare and qualify the next generation of behavioral practitioners. With its academic rigor and access to leading corporate field settings, Penn MBDS is uniquely positioned to provide a best-in-class experience."

Charlotte Blank
Chief Behavioral Officer, Maritz

"I have unique experiences in combining my academic background and industry experience, and I love to be able to share these experiences to help people who are interested in making a similar bridge in behavior science between academics and industry."

Namika Sagara
President, North America, Behavioral Science Center, Ipsos

"MBDS students are being taught to look at problems in more integrated and human-centered ways. This is at the core of how we work at Deloitte Consulting, and I'm delighted to support a program that is so well aligned with what the market needs from consultants and other problem-solvers."

Greg Szwartz
Practice Lead – Healthcare Predictive Modeling, Deloitte Consulting

About our Design Challenges

The MBDS program hosts Design Challenges every spring to drive collaboration between student groups and industry partners who, together, integrate cutting edge knowledge into real-life problems. This spring, fifty-four students teamed up to tackle twelve challenges in health, wellness, sustainability, technology integration in marketing, and finance over six weeks.

Learn more about how MBDS connects students and industry at

www.upenn.edu/mbds

WARWICK
THE UNIVERSITY OF WARWICK

MSc in Behavioural and Economic Science

The Departments of Psychology and Economics at the University of Warwick offer innovative new courses in the growing area of decision science and behavioural economics. The MSc draws on the excellent, ground-breaking research being undertaken in the departments of Psychology, Economics and the Warwick Business School.

The MSc will suit those with a quantitive background (e.g. maths, sciences, economics, psychology).

Further Details:
Email: **PsychologyPG@warwick.ac.uk** Tel: **+44 (0)24 7657 5527**

www.warwick.ac.uk/bes

WARWICK
THE UNIVERSITY OF WARWICK

MSc in Behavioural and Economic Science

Why should I take this course?

This inter-disciplinary course emphasises both theoretical foundations and real-world applications of Behavioural Science, and is aimed at those intending to work in business, public policy implementation or research.

Modules will include

- A thorough grounding covering both the theory and real-world application, in behavioural economics and the cognitive science of judgement and decision making.
- Modules on the design, conduction and analysis of behavioural experiments and the analysis of large-scale datasets.
- An empirical research project.

Our previous students have gone on to take positions at The Busara Center for Behavioral Economics, The UK Behavioural Insights Team, Google, Frontier Economics, Facebook, Ogilvy Change and more.

Further Details:
Email: **PsychologyPG@warwick.ac.uk** Tel: **+44 (0)24 7657 5527**

www.warwick.ac.uk/bes

WARWICK
THE UNIVERSITY OF WARWICK

Why Warwick?

You will be taught by leading researchers from the Departments of Psychology and Economics and Warwick Business School.

Three leading departments in this area of research.

Warwick has been ranked top of the specialist subject table for Economics in The Times and the Sunday Times University League Tables for 2020. Behavioural Science was identified as an area of significant academic achievement in the Research Excellence Framework.

Warwick is a global community. Our students come from all over the world, including South America, Asia, Europe, USA and the Middle East and from many backgrounds including undergraduate study, industry and the public sector.

Find out more about Postgraduate Study at Warwick
www.warwick.ac.uk/study/postgraduate

Further Details:
Email: **PsychologyPG@warwick.ac.uk** Tel: **+44 (0)24 7657 5527**

www.warwick.ac.uk/bes

Postgraduate Programs

(Taught in English)

University	School/Department	Program
United States		
Brown University	School of Public Health	Master of Public Health (Health Behavior concentration)
	Department of Economics	PhD in Economics
California Institute of Technology (Caltech)	Division of the Humanities and Social Science	PhD in Social and Decision Neuroscience
Carnegie Mellon University	Department of Social and Decision Sciences	PhD in Social and Decision Sciences
	Tepper School of Business	PhD in Behavioral Economics (see also Dynamic Decision Making Laboratory) (see also Center for Behavioral and Decision Research)
Chapman University	Economic Science Institute	MS in Behavioral and Computational Economics
The Chicago School of Professional Psychology		Masters in Behavioral Economics **See pp. 206-208**
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 (see also Lab for Experimental Economics & Decision Research) (see also Cornell Center for Behavioral Economics in Child Nutrition Programs)
Duke University	The Fuqua School of Business	MBA and PhD in Business Administration (Marketing or Decision Sciences track)

Franklin University	College of Arts, Sciences & Technology	Master's in Business Psychology
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
Massachusetts Institute of Technology	Department of Brain and Cognitive Sciences MIT Sloan School of Management	PhD in Brain and Cognitive Sciences Masters in Management, Analytics, Applied Economics (see also MIT Sloan Neuroeconomics Laboratory)
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)
Ohio State University	Department of Psychology	PhD in Psychology (Decision Psychology) (see also Decision Sciences Collaborative)
Stanford University	Department of Economics	PhD in Economics (Behavioral & Experimental specialization) (see also Institute for Economic Policy Research)
Texas A&M University	Department of Economics	PhD in Economics (see also Economic Research Laboratory)
University of Arizona	Eller College of Management	PhD in Economics (see also Institute for Behavioral Economics)
University of California, Berkeley	Haas School of Business Department of Psychology Department of Economics	PhDs in Marketing, Psychology and Economics (see also Initiative for Behavioral Economics & Finance) (see also Berkeley Decision Science Research Group)
University of California, Los Angeles	Anderson School of Management	PhD Behavioral Decision Making

University of California, San Diego	Rady School of Management	MBA and PhD in Management (see also Atkinson Behavioral Research Lab)
University of California, Santa Barbara	College of Letters & Science	PhD in Economics (see also Experimental and Behavioral Economics Laboratory)
University of Chicago	Booth School of Business	MBA PhD in Behavioral Science (see also Center for Decision Research)
University of Kansas	College of Liberal Arts and Sciences	MA in Applied Behavioral Science PhD in Behavioral Psychology (see also KU Applied Behavioral Economics Laboratory)
University of Maryland	College of Behavioral & Social Sciences	PhD in Social, Decision, and Organizational Sciences
University of Oregon	College of Arts and Science	MA and PhD in Psychology PhD in Economics
	Lundquist College of Business	PhD in Marketing (see also Institute of Cognitive and Decision Sciences)
University of Pennsylvania	School of Arts & Sciences	Master of Behavioral and Decision Sciences **See pp. 212–214** (see also Behavioral Ethics Lab) (see also Social Norms Group)
University of Pittsburgh	Katz Graduate School of Business	PhD in Marketing
	Dietrich School of Arts & Sciences	PhD in Economics
University of Southern California	Dana and David Dornsife College of Letters, Arts, and Sciences	PhD in Economics (see also Los Angeles Behavioral Economics Laboratory)
University of Wisconsin	School of Human Ecology	MS and PhD in Human Ecology: Consumer Behavior and Family Economics (see also Behavioral Research Insights Through Experiments Lab)
Washington University in St. Louis	School of Arts and Sciences	PhD in Behavior, Brain and Cognition (see also Behavioral Economics Laboratory)

Yale University	Yale School of Management	Doctoral Programs in Financial Economics, Marketing, and Organizations and Management (See also Yale-Ipsos Consumer Marketing & Behavioral Economics Think Tank)

United Kingdom

Abertay University	Division of Psychology	MSc, MPhil, PhD in Behavioural Science
City University London	Interdisciplinary School of Arts and Social Sciences	MSc in Behavioural Economics PhDs in Economics and Psychology (see also Decision Making and Behavioural Economics Research Group)
Durham University	Department of Psychology Durham Business School	MSc in Behavioural Science MSc in Experimental Economics
Kingston University	Faculty of Arts and Social Sciences	MSc in Behavioural Decision Science
Lancaster University	Management School	PhD Behavioural and Experimental Economics
London School of Economics and Political Science	Department of Psychological and Behavioural Science	MSc in Behavioural Science Executive MSc in Behavioural Science **See pp. 209-211**
	Departments of Management, Social Policy, Economics and Psychological and Behavioural Science	PhDs in Management (Marketing), Social Policy, Economics and Psychological and Behavioural Science (see also LSE Behavioural Lab for Teaching and Research)
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 Division of Psychology And Language Sciences School of Management and the Behavioural Insights Team	Executive Programme in Behavioural Science MSc in Cognitive and Decision Sciences MSc in Behaviour Change PhD in Experimental Psychology 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
		MSc in Behavioural Economics and Data Science
		(see also Behavioural and Experimental Economics Group)
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
	Graduate Institute of International Development, Agriculture and Economics	MSc in Consumer Behaviour
University of Stirling	Stirling Management School and Behavioural Science Centre	MSc in Behavioural Science for Management
		(see also Behavioural Science Centre)

University of Warwick	Interdisciplinary	MSc in Behavioural and Economic Science **See pp. 215-217**
	Department of Psychology	PhD in Psychology (see also Behavioural Science Group)
	Department of Psychology & Department of Computer Science	MSc Behavioural and Data Science

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)	School of Economics	MSc in Economics (Behavioural Economics and Game Theory track) PhD in Economics (Behavioural Economics research priority area)
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)
Wageningen University & Research		MSc in Statistical Science for the Life and Behavioural Sciences

Germany

Friedrich-Schiller University Jena	Jena Graduate School	PhD in Human Behaviour in Social and Economic Change
Applied University at Hamm-Lippstadt		Intercultural Business Psychology Masters (Economic Psychology concentration)
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 Applied Economics and Econometrics
	School of Business, Monash University Malaysia.	PhDs in Business and Economics (see also Monash Laboratory for Experimental Economics) (see also Monash Business Behavioural Laboratory)
RMIT University		Master of Business (Behavioural Economics specialization) PhD in Economics, Finance & Marketing (Behavioural Economics specialization) (see also Behavioural Business Lab)
University of Melbourne	School of Psychological Sciences	Master of Applied Psychology
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 (Business & 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 Bourgogne Franche-Comté (UBFC)		MSc in Behavioral and Digital Economics for Effective Management
University of Paris Panthéon-Sorbonne / University Paris Descrates		Master in Economics & Psychology

India

Christ University		Master of Science in Behavioral Science

Ireland

Trinity College Dublin		MSc Applied Behaviour Analysis
University College Dublin	School of Economics	MSc Behavioural Economics

Israel

Hebrew University of Jerusalem	The Federmann Center for the Study of Rationality	PhDs at the Federman Center for the Study of Rationality (interdisciplinary)
IDC Herzliya	Raphael Recanati International School	MA Behavioral Economics

Italy

Bocconi University in Milan		Bocconi Experimental Laboratory for the Social Sciences
Catholic University of the Sacred Heart, Milan	PhD School in Economics and Finance	PhD Economics and Finance
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
		Master in Behavioral Economics & Neuromarketing
University of Trento	Department of Economics and Management	Master in Behavioural and Applied Economics
	Doctoral School of Sciences	PhD in Economics and Management (Behavioural Economics)

Norway

Norwegian School of Economics		PhD in Business and Management Science
		(see also the Choice Lab)

Portugal

Universidade Catolica Portuguesa		Master in Psychology in Business and Economics

Romania

University of Bucharest	Faculty of Business and Administration & Faculty of Psychology	Master in Behavioural 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)

South Africa

University of Cape Town	School of Economics	Masters and PhD in Economics (see also Research Unit in Behavioural Economics and Neuroeconomics)

Spain

University of Barcelona	Faculty of Psychology	Master's in Research in Behaviour and Cognition

Sweden

University of Gothenburg	School of Business, Economics, and Law	PhD in Economics (Behavioural Economics concentration) (see also Behavioural and Experimental Economics Group)

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)

Other Resources

For the most up-to-date behavioral science resources, including jobs, events, popular books, and scholarly journals, please visit

BehavioralEconomics.com

APPENDIX

Author Profiles

John List (Introduction)

John A. List is Kenneth C. Griffin Distinguished Service Professor in Economics at the University of Chicago. His research focuses on combining field experiments with economic theory to deepen our understanding of the economic science. In the early 1990s, List pioneered field experiments as a methodology for testing behavioral theories and learning about behavioral principles that are shared across different domains. He was elected a Member of the American Academy of Arts and Sciences in 2011, and a Fellow of the Econometric Society in 2015. List received the 2010 Kenneth Galbraith Award, the 2008 Arrow Prize for Senior Economists for his research in behavioral economics in the field, and was the 2012 Yrjo Jahnsson Lecture Prize recipient. He is a current editor of the *Journal of Political Economy*.

Iris Bohnet (Guest editorial)

Iris Bohnet, the Albert Pratt Professor of Business and Government, is the Academic Dean of Harvard Kennedy School. She is a behavioral economist, combining insights from economics and psychology to improve decision-making in organizations and society, often with a gender or cross-cultural perspective. Her most recent research examines behavioral design to de-bias how we live, learn and work. She is the author of the award-winning book *What Works: Gender Equality by Design*, and advises governments and companies on the topic around the world. Professor Bohnet is the co-director of the Women and Public Policy Program and the faculty chair of the executive program "Global Leadership and Public Policy for the 21st Century" for the World Economic Forum's Young Global Leaders. She serves on the boards, advisory boards or as a patron of Credit Suisse Group, Applied, Edge, genEquality, TaketheLeadWomen, We Shape Tech, Women in Banking and Finance, and the UK Government's Equalities Office as well as numerous academic journals. She was named one of the Most Influential People in Gender Policy by apolitical in 2018 and 2019, a Leading Thinker of Victoria, Australia, 2016-2019, and has received an honorary degree from the University of Lucerne, Switzerland, in 2016. She is married and the mother of two children.

Siri Chilazi (Guest editorial)

Siri Chilazi is a Research Fellow at the Women and Public Policy Program at Harvard Kennedy School. Her life's work is to advance gender equality in the workplace through research and research translation. As an academic researcher, Siri specializes in identifying, testing, and documenting specific interventions that work to close gender gaps and de-bias structures and processes in organizations. As an advisor and speaker, Siri brings these evidence-based insights to practitioners and frequently collaborates with organizations including Fortune 500 companies, top professional services firms, start-ups, and leading academic institutions. She has presented at numerous conferences around the world, and her work regularly appears in leading media outlets including Harvard Business Review, The New York Times, BBC, Fast Company, and Forbes. Siri has an MBA from Harvard Business School, a Master in Public Policy from Harvard Kennedy School, and a BA in Chemistry and Physics from Harvard College.

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@behavioraleconomics.com

Andreas Haberl (Editorial Assistant)

Andreas Haberl is the editorial assistant of the Behavioral Economics Guide. Past experiences include being an Argo Scholar in Public Diplomacy at the Embassy of Spain in Australia, doing an internship as research assistant at US behavioral WealthTech Syntoniq Inc and being Behavioral Design Analyst at Monaco-based Panthera Solutions sarl. He recently started a new role at Fisher Investments Europe in London.

Andreas completed four postgraduate degrees in Spain, England and Scotland. He holds a Dual-Licentiate (Premio Extraordinario) in Political Science and Adverising from CEU Cardinal Herrera University, a MiM from the UCL School of Management, and a Master of Science in Behavioural Decision Making for Finance from the University of Stirling. Collaborating at Behavioral Science Solutions since 2015, he has a special passion and enthusiasm for long-term decision making, investing, finance and sustainability.

Contributing Organizations

Think Forward Initiative

Empower People to Make Better Financial Decisions

The Think Forward Initiative (TFI) is based on the belief that our society is better off when people make sound financial decisions. TFI's Research Hub does cutting-edge, data-driven research in social and behavioural sciences to learn more about people's decision-making. TFI's Accelerator Hub translates research insights into innovations. It scouts and selects start-ups and supports them to scale faster and helps people to change their behaviour and improve their financial well-being. Lastly, TFI's Community Hub promotes the activities of the other two hubs through our network of TFI community members, and it launches campaigns to ensure our work reaches the people that need it the most.

www.thinkforwardinitiative.com

Behavior & Law

Behavior & Law is a company established in Florida (US) and Madrid (Spain), 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.

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. Currently, Behavior & Law is offering a Master's degree in Behavioral Economics, in collaboration with the Madrid University UDIMA.

www.behaviorandlaw.com

The Behavioral Insights Team

Starting life inside the UK Government the Behavioral Insights Team (BIT) has evolved to become a world-leading social purpose company with over 200 staff and with offices in London, Manchester, New York, Paris, Sydney, Toronto, Wellington and Singapore. Our mission is simple: we generate and apply behavioural insights to inform policy, improve public services and deliver positive results for people and communities.

We work closely with central government, regulators, national agencies, local government, local public services, voluntary sector agencies and socially responsible businesses.

Our focus is on the practical, sometimes small things, that make a big difference. It can be a single sentence in a letter or a text message from a friend.

Whether we're working to encourage healthier eating, recycling or volunteering, we bring unrivalled expertise in behavioural science, a deep knowledge of public policy and the pragmatism to make change happen.

www.bi.team

Dectech

Dectech strives to provide the most accurate and best value forecasts available on how people will behave in new situations. Founded in 2002, we've conducted more than 400 studies involving over three million participants. We hold that people

make very different decisions depending on their context and often struggle to self-report their beliefs and motives. So, we developed Behaviourlab, a randomised controlled trial approach that immerses participants in a replica of the real-world decision environment. Over the years we've shown how Behaviourlab can provide higher accuracy forecasts and more actionable insights.

www.dectech.co.uk

Frontier Economics

Frontier Economics is a consulting firm with over 200 economists across London, Berlin, Brussels, Cologne, Dublin, Madrid and Paris. We specialise in competition, regulation and strategy, across all major sectors and areas of economic analysis.

Our clients benefit from objective advice, clearly expressed, that helps to inform key decisions. To get to the heart of what matters, you need both analytical expertise and creative problem solving. Frontier Economics combines both to take on some of the biggest questions facing business and society.

We combine our expertise in economics with behavioural sciences to develop a richer picture of the present, helping us to advise our clients on the right decisions for them, for future success. We have one of the largest economic regulation practices in Europe - our behavioural economics work supports wider engagement with regulators and helps develop regulatory policy. Our work on customer strategy centres around understanding the actual behaviours of our clients' customers to help develop innovative customer-based solutions.

www.frontier-economics.com

Geisinger

Geisinger is committed to making better health easier for the more than 1 million people it serves. Founded more than 100 years ago by Abigail Geisinger, the system now includes nine hospital campuses, a 550,000-member health plan, two research centers and the Geisinger Commonwealth School of Medicine. With nearly 24,000 employees and more than 1,600 employed physicians, Geisinger boosts its hometown economies in Pennsylvania by billions of dollars annually.

www.geisinger.org

GetReskilled

GetReskilled is a private education provider for the Pharmaceutical manufacturing industry, with online programmes for experienced workers, focussed on the knowledge and skills necessary to manufacture safe medicines and vaccines.

Their strong research team are focussed on developing a better understanding of the decision making of experienced workers in the areas of career change and lifelong learning, and how this behaviour aligns with current best practice in Behavioural Science. This research has particular relevance for Government back to work initiatives.

Their work has been presented at major conferences including the World Conference on Online Learning in Dublin 2019 (WCOL), the International Multi-Conference on Society, Cybernetics and Informatics 2020 (IMSCI), the International Conference on Education Research and Innovation 2020 (ICERI), the International Technology, Education and Development Conference 2021 (INTED) and at the BEST Conference on Human Behaviour and Decision Making 2021.

www.getreskilled.com

Gorilla Experiment Builder

We make powerful, flexible and intuitive software for pioneering behavioural science students, researchers and practitioners to help them run novel behavioural experiments on humans quickly, easily and cheaply.

Academics use our software to make discoveries about all aspects of the human mind (for instance memory, attention, language and emotions).

Students use our software to learn how to conduct online research methods and prepare for careers that value digital experimentation (such as market research and advertising).

Practitioners use our software to design and run behavioural experiments that provide their clients with behavioural insights. The outcomes of these experiments deliver value to clients in a wide range of scenarios.

Providing behavioural scientists with the tools needed accelerate their research will liberate this community to creatively use their knowledge to discover behavioural insights that address a wide range of challenges in society.

www.gorilla.sc

IAG

IAG is the parent company of a general insurance group (the Group) with controlled operations in Australia and New Zealand.

The Group's businesses underwrite over $12 billion of premium per annum, selling insurance under many leading brands, including: NRMA Insurance, CGU, SGIO, SGIC, Swann Insurance and WFI (Australia); and NZI, State, AMI and Lumley (New Zealand). IAG also has an interest in a general insurance joint venture in Malaysia.

IAG's applied behavioural science capability strives to improve customer outcomes and is purpose-led, to make the world a safer place.

www.iag.com.au

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 57,000 employees offer retail and wholesale banking services to customers in over 40 countries.

Global Sustainability helps to create a healthy planet with prosperous people. A planet free from the threat of climate crisis. People with basic human rights, decent work, good labour conditions and, ultimately, good financial health. As a partner it is also strongly involved in the Think Forward Initiative, 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.

https://www.ing.com/Sustainability/Sustainability-direction.htm

National Acoustic Laboratories

Established over 70 years ago, the National Acoustic Laboratories (NAL), the research division of Hearing Australia, is a world-leader in hearing research and evidence-based innovation. NAL's focus is applied research aimed at improving hearing health and transforming the lives of people with hearing difficulties.

NAL's Behavioural Sciences department investigates the human element at the heart of hearing health. Through the application of knowledge from the field of behavioural science, they seek to promote better hearing health by empowering individuals to take action - to prevent hearing loss and/or engage with hearing rehabilitation

Most recently, the team has been focused on research within the clinical setting, seeking to identify and address cognitive biases that create barriers for optimal hearing health. This work pays particular attention to how information is presented and interpreted within the audiologist-patient dynamic, and how nudges for both parties can create environments for more informed decision-making and improved outcomes.

www.nal.gov.au

OECD

The Organisation for Economic Co-operation and

Development (OECD) is an international organisation that works to promote policies to improve the economics and social well-being of people around the world. Together with governments, policy makers and citizens, the OECD works on establishing evidence-based international standards and finding solutions to a range of social, economic and environmental challenges. The OECD's Executive Directorate is responsible for managing and coordinating the corporate services of the organisation, including, for example, financial and human resources management, information technology and internal communication services as well as operational services including building infrastructure and logistics. It has been applying innovative approaches in management including the use of behavioural insights within human resource management, digital security and health and safety, as well as enhancing and debiasing decision-making to make behaviour change.

www.oecd.org

Old Mutual

Founded in Cape Town, South Africa in 1845, Old Mutual Limited (OML) is a premium African financial services group that offers a broad spectrum of financial solutions to retail and corporate customers. OML operates in 14 countries, and employs over 30,000 people across Africa and Asia.

The key services of the group include:

1. Providing life assurance-based solutions and short term insurance.
2. Growing customers' savings and wealth through active and direct asset management, and using multi-managers to select funds for customer investments.
3. Supplying loans and debt consolidation services tailored to the individual needs of our customers.
4. Offering a low-cost transactional account linked to a unit trust savings account, known as the Money Account.

OML's purpose is to help its customers thrive by enabling them to achieve their lifetime financial goals, while investing their funds in ways that will create a positive future for them, their families, their communities and broader society. In this way, OML significantly contributes to improving peoples' lives, while ensuring a sustainable future for the group.

www.oldmutual.com

Quadrangle Consulting Services

Quadrangle Consulting Services is a boutique consulting firm that offers a wide range of talent and customer solutions built on theories and models from behavioral sciences. Our team of social and organization psychologists work with over 200 cross-sector clients. Using our skills in psychometrics, statistics and research, we deliver comprehensive outcomes that are reliable and predictive.

We offer customer and talent profiling research & services, bespoke behavioral assessment, nudge based communication design, as well as consultation in customer & people process design. We routinely develop assessment instruments and surveys to measure behavior and create predictive models around retention and performance for large scale implementation.

Our solutions are tailored to the demographic and economic diversity of talent and customer segments in the Indian Subcontinent.

www.quadrangleconsulting.org

Rare

Rare is the leading behavior change organization in the environmental field, recognizing that conservation ultimately comes down to people. For over 45 years and across 60 countries, Rare has supported individuals, their communities, and their local leaders to adopt behaviors that benefit both people and nature. The Center for Behavior & the Environment translates science into practice and leverages the best behavioral insights and design thinking approaches to tackle some of the most challenging

environmental issues. Through partnerships with leading academic institutions and with environmental practitioners, we are translating the science of human behavior into practical solutions for conservationists worldwide.

behavior.rare.org

UK Finance

UK Finance is the collective voice for the banking and finance industry. Representing nearly 300 firms, through research, policy expertise, thought leadership and advocacy it acts to enhance competitiveness, customer engagement and innovation, promoting a safe, transparent and innovative sector. Its Academies and discussion forums promote members' knowledgeable engagement with many stakeholder interests.

UK Finance's Conduct and Culture Academy (CCA) promotes effective use of behavioural science among financial service providers. Co-founded by Dr Roger Miles, it brings together senior finance practitioners to socialise human-factor risk insights and approaches, to lead constructive engagement with regulators, and to identify and report on significant components of 'purposeful culture'. More than 100 conduct leaders – and several conduct regulators – have graduated the Academy's core course. 4000+ financial business unit leaders in more 20 countries have vigorously supported UK Finance's Conduct Focus participative workshops, awarding these consistently 5* approval ratings.

Anthologies of CCA-related research include Conduct Risk Management: A Behavioural Approach (2017) and Culture Audit in Financial Services (2021) (both Kogan Page).

www.ukfinance.org.uk

Vocatus

Vocatus is a market research and consulting company specializing in the application of behavioral economics to portfolio, product, sales and pricing strategy in both B2C and B2B. We have been awarded numerous prizes for developing research methodology (for example, 'ESOMAR Congress Award' 2012 for the 'Best Methodological Paper') as well as for proving that the application of behavioral economics has a significant impact on our clients' return on investment (for example, 'ESOMAR Research Effectiveness Award' 2012 and 2013 for the most effective market research projects). Founded in 1999, Vocatus is headquartered in Munich, Germany, and serves clients all over the world.

www.vocatus.com